ARISTOTLE

COMPLETE WORKS

EDITED BY

C. D. C. REEVE & PAVLOS KONTOS

VOLUMES

1 & 2

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— VOLUMES 1 & 2—

Edited by

C. D. C. Reeve

&

Pavlos Kontos

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Catalogs of Aristotle's Writings

Pavlos Kontos and C. D. C. Reeve 1039

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LIST OF ABBREVIATIONS

Aristotle

APo.	*Posterior Analytics*
APr.	*Prior Analytics*
Ath.	*The Athenian Constitution*
Cael.	*De Caelo*
Cat.	*Categories*
DA	*De Anima (On the Soul)*
Div. Somn.	*On Prophecy during Sleep*
EE	*Eudemian Ethics*
F	*Fragments*
GA	*On the Generation of Animals*
GC	*On Coming to Be and Passing Away*
HA	*On the History of Animals*
IA	*On the Progression of Animals*
Insomn.	*On Dreams*
Int.	*De Interpretatione*
Juv.	*On Youth and Old Age, Life and Death, and Breathing*
Long.	*On Length and Shortness of Life*
MA	*On the Movement of Animals*
Mem.	*On Memory and Recollection*
Met.	*Metaphysics*
Mete.	*Meteorology*
†*MM*	*Magna Moralia*
NE	*Nicomachean Ethics*
PA	*On the Parts of Animals*
Ph.	*Physics*
Po.	*Poetics*
Pol.	*Politics*
†*Pr.*	*Problems*
Resp.	*On Respiration*
Rh.	*Rhetoric*
SE	*Sophistical Refutations*
Sens.	*De Sensu et Sensibilibus (On Perception and Perceptible Objects)*
Somn.	*On Sleep and Waking*
Top.	*Topics*

Other Abbreviations

Bowra = C. Bowra, *Pindari Carmina* (Oxford, 1935).
Diehl = E. Diehl, *Anthologia Lyrica Graeca* (2 vols., Leipzig, 1925).
DK = H. Diels and W. Kranz, eds., *Die Fragmente der Vorsokratiker*, 6th ed. (Berlin, 1952).
DL = T. Dorandi, ed., Diogenes Laertius, *Lives of Eminent Philosophers* (Cambridge, 2013).
Isnardi = M. Isnardi Parente and T. Dorandi, eds., *Senocrate e Ermodoro, Testimonianze e Frammenti* (Pisa, 2012).
Kaibel = G. Kaibel, *Epigrammata Graeca: Ex Labidus Conlecta* (Berlin, 1878).
Kinkel = G. Kinkel, *Epicorum Graecorum Fragmenta* (Leipzig, 1878).
Kock = T. Kock, *Comicorum Atticorum Fragmenta* (3 vols., Leipzig, 1880).
Lobel & Page = E. Lobel and D. Page, *Poetarum Lesbiorum Fragmenta* (Oxford, 1955).
Nauck = A. Nauck, *Tragicorum Graecorum Fragmenta*, 2nd ed. (Leipzig, 1889).
Page = D. Page, *Poetae Melici Graeci* (Oxford, 1962).
Tarán = L. Tarán, *Speusippus of Athens* (Leiden, 1981).
West = M. West, *Delectus ex Iambis et Elegis Graecis* (Oxford, 1980).
† = Dubious
†† = Spurious

PREFACE

These two volumes aim to provide the Anglophone reader with accurate and consistent translations of authoritative editions of the complete works of Aristotle, together with one (slightly) dubious work, the *Magna Moralia*, and one work not by Aristotle, but from his school, the *Athenian Constitution*. The former, whatever its exact provenance, is a sufficiently important source for readers interested in understanding Aristotle's ethical thinking to be included with the *Nicomachean Ethics* and *Eudemian Ethics*. The latter merits inclusion as the one surviving example of the sort of empirical constitutional history on which Aristotle's political theorizing is in part based.

Other works traditionally associated with Aristotle, though probably not by him, are in most cases included in Immanuel Bekker's standard edition (Berlin, 1831)—these, along with some others not included in Bekker, will be collected in a separate volume. Citations are made to this edition, in the canonical form of abbreviated title, page number and column letter (a, b), or occasionally just by book and chapter numbers. Line numbers, which are to the editions specified, are approximate in the translations, where they appear in the margins at the end of the lines to which they refer, or within upright lines in the epub edition.

Though the present organization better serves readers interested primarily in Aristotle himself than one modeled on Bekker, it results in gaps in the order of the Bekker page numbers. The Introduction indicates where these occur and discusses how what we call the "*Complete Works*" of Aristotle came about.

Accuracy is, of course, difficult to achieve with works that are so diverse in subject matter and so complex, and we are grateful to the many experts who have helped the translators achieve it. We are grateful to the translators themselves for agreeing to translate (especially) key terms in a consistent way, so that readers can move somewhat seamlessly from one treatise to another, confident that what is, for example, *epistêmê* ("scientific knowledge"), *ousia* ("substance"), *to ti ên einai* ("essence"), or *nous* ("understanding") in one treatise is not called something else in another. These terms, along with many others, are included in the extensive Annotated Glossary of Terms, with which readers—especially those unfamiliar with Aristotle—should acquaint themselves before venturing too far into the works themselves. The longer, more interpretative entries, however, express the views of their author and are a place to start, not to finish—a first step in coming to understand Aristotle for oneself. The Introduction also discusses some of the same material as part of a connected narrative describing Aristotle's philosophy as a whole. The numerous people and places Aristotle mentions are briefly identified in the annotated index of these.

A number of the translations first appeared, with extensive introductions and notes, in the New Hackett Aristotle series. Though these have been substantially revised and corrected, they can be usefully consulted by readers in search of further guidance. The

sparser notes included here direct the reader to illuminating passages and help make particularly difficult ones intelligible.

In general, the translations are traditional where the costs of innovation exceed the benefits, innovative where the benefits exceed the costs. In the case of *phronêsis*, *aretê*, and *eudaimonia*, for example, the traditional and largely entrenched translations—"practical wisdom," "virtue," and "happiness"—have been preserved for these reasons, while those of *eidos* as "form," "kind," or "species," *genos* as "kind" or "genus," *diaphora* as "difference" or "differentia," and *ergon* as "function," or "work," which are retained in many of the Hackett series editions, have been abandoned systematically in favor of "form," "kind," "difference," and "work" alone. Readers can now generally determine for themselves how a given occurrence of any of these terms is best understood.

Aristotle's treatises are, in some cases, more commonly known by their Latin titles, in others, by their English ones. We have generally followed standard practice in this regard, especially in the case of abbreviated titles, since this makes it easier to correlate the texts with commentaries and other secondary materials. Some titles, however rendered, nonetheless require comment. This has been supplied in the pertinent headnotes and in the Introduction.

The editions of the Greek texts themselves record in the textual apparatus at the bottom of the page various manuscript readings alternative to the ones printed in the body of the text. In some cases, translators have preferred one of these readings and have, when important, indicated so in the notes. These, which alone include non-transliterated Greek, will be of interest to readers who are also consulting the Greek text and can be ignored by others. Occasional material in square brackets in the text, as well as the various chapter headings and figures, have been added by the translators, typically for intelligibility.

Editorial responsibilities were divided as follows: C. D. C. Reeve established the norms of translation and edited the translations not credited to him, ensuring—among other things—that they follow these norms. Pavlos Kontos was responsible for the final editing of all the translations and for ensuring their accuracy and correctness. Everything else was their joint responsibility.

INTRODUCTION*

Christof Rapp

1. Who Was Aristotle?

Aristotle was a Greek philosopher who lived in the fourth century BC. He is widely regarded as one of the greatest figures in Western philosophy. Born in 384 in the city of Stagira in northern Greece, he joined Plato's Academy in Athens when he was about seventeen years old, where he then studied and taught for nearly two decades. Around the time of Plato's death in 347, Aristotle left Athens and traveled to the city of Assos in Asia Minor. He later moved to the nearby island of Lesbos. In 342 he received an invitation from King Philip II of Macedon to tutor his son Alexander, who would later become known as Alexander the Great. Aristotle returned to Athens in 335 and established his own school, the Lyceum. This school came to be known as the Peripatos, and its members as Peripatetics. Due to rising anti-Macedonian sentiment in Athens in 323, Aristotle withdrew to Chalcis on the island of Euboea, where he passed away in 322. Accordingly, it is common to distinguish between Aristotle's first stay in Athens (approximately between 367/366 and 348/347), his "exile" on Lesbos and in northeastern Greece (approximately between 348/347 and 335), and his second stay in Athens (until 323/322).

The city of Stagira, where Aristotle was born and where he spent parts of his childhood, is located on the peninsula of Chalcidice in the Macedonian part of modern Greece. However, it was not part of the ancient Macedonian Empire at the time Aristotle lived there. When the Macedonians attacked the city of Olynthus, an ally of Athens, in 349, they also destroyed Aristotle's hometown of Stagira. Still, in the Athens of those days, Aristotle might have been perceived as a friend of the Macedonians, probably due to his family's ties to the Macedonian royal court. His parents, Nicomachus and Phaestis, both came from families with a medical background, and his father was reported to be doctor to King Amyntas III of Macedon, the father of Philip II. It might be owing to the same familial connection that Aristotle was commissioned to be the tutor of young Alexander. During his time in Asia Minor Aristotle married a woman by the name of Pythias; probably from this marriage resulted his daughter, also named Pythias, and his son, named after Aristotle's father, Nicomachus. After Pythias' death, Herpyllis (who is also mentioned in Aristotle's last will) became his partner. During his exile from Athens

* For the thorough revision of my text I am grateful to the editors; for the content of section 2, I am indebted to my long-standing collaboration with Oliver Primavesi.

he also met the person who became his closest student and friend, Theophrastus. Based on the flora and fauna of the island of Lesbos, it can be shown that it was there that Aristotle and Theophrastus commenced their zoological and botanical studies.

While Aristotle's philosophy is clearly and significantly influenced by Plato, he diverges from his mentor in numerous important ways. One of his primary innovations is the division of philosophical inquiry into several distinct and independent subjects, including logic, zoology, biology, cosmology, ethics, and political theory. He counters Plato's hypothesis concerning the existence of eternal, separate Forms. Nevertheless, form remains a central concept in his own philosophy. Unlike Plato's Forms, Aristotle's forms do not exist independently from the perceptible world, but instead generally inform a portion of matter, with form and matter collectively constituting specific entities in the perceptible world, such as particular animals or plants.

Even though Plato's influence is significant, Aristotle's own thought was shaped not only by Plato and the philosophers of the Platonic Academy, but also by a wide array of other thinkers, crafts, and sciences. Notably, Aristotle is renowned for his thorough discussions of the Presocratic philosophers, thinkers who lived between the sixth century BC and the time of Socrates' death in 399. For instance, he extensively examines Eleatic philosophers such as Parmenides and Zeno of Elea, Heraclitus, the Pythagoreans, Anaxagoras, Empedocles, and Democritus. In fact in some cases, Aristotle's reports and discussions serve as the most reliable sources for these thinkers' theses and theories. In his work on cosmology and primary philosophy (metaphysics), Aristotle often draws on the expertise of the celebrated astronomers of his time.

He also displayed a keen interest in contemporary mechanical studies, occasionally appealing to mechanical laws and referencing various mechanical devices. His biological works reveal a substantial understanding of the contemporary craft of medicine and incorporate knowledge from sources such as hunters, fishermen, animal breeders, beekeepers, and travel reports. Within his school, the Lyceum, individual students worked on the history of musicology and medicine. Aristotle organized the compilation of a collection of 158 political constitutions from past and present (see Diogenes Laertius 5.27). He is also cited as the author of a collection of rhetorical manuals (F97–98). In a similar vein, his *Poetics* proves his intimate familiarity with Greek epic and tragedy.

Taking all these endeavors within his widely ramified oeuvre into account, one gains the impression that Aristotle utilized his lifespan to thoroughly explore nearly all available fields of knowledge, science, and culture at the time and that he was open to influences of all kinds. In some fields, he offered truly original and groundbreaking insights (for example, on logic or zoology), while in others he reorganized existing crafts and sciences, and in some cases managed to leave them in a better structured state.

2. The *Complete Works* of Aristotle: What Is Included and How the Collection Came About

What is included in an edition called the "*Complete Works*" of Aristotle? Everything Aristotle ever wrote? Or everything he ever published? Unfortunately, the formation of the Aristotelian oeuvre is more complicated and, also, much more fortuitous than these two possible answers may suggest. For, as a matter of fact, a significant part of what Aristotle wrote or published is lost (probably for all time), whereas major parts of what we nowadays regard as the essential works of Aristotle—for example, his *Metaphysics*, *Prior Analytics*, or *Nicomachean Ethics*—were probably never meant for publication. But let us take one thing at a time!

What we now regard as "the works" or "the complete works" of Aristotle ultimately originates from an ancient collection of treatises attributed to him. This collection was originally compiled between the first century BC and the second century AD, a few centuries after Aristotle's death. These works have been transmitted under the name of "Aristotle" and are commonly known as the *Corpus Aristotelicum*. For centuries, the works included in it were copied and transmitted as manuscripts, because they were considered the authentic contributions of the renowned Greek philosopher Aristotle, representing his complete or essential body of work.

None of the works within the *Corpus* have survived as ancient papyri. The oldest existing Greek manuscripts of them date back to the ninth century AD. During this period, ancient majuscule manuscripts (lacking accents and spaces) of esteemed authors were transliterated in Constantinople into more readable minuscule manuscripts, featuring accentuation and spacing between words. Around the same time, starting in the ninth century, a well-orchestrated initiative in Baghdad aimed to translate Aristotle's works into Arabic, sometimes using Syriac translations, as certain key translators were Syriac scholars proficient in both Greek and Arabic. The first printed edition of the Greek text containing all the works in the *Corpus Aristotelicum* (except for the *Poetics* and the *Rhetoric*), known as the *Aldina*, was published in Venice between 1495 and 1498 by the editor Aldus Manutius.

The basis for modern scholarship on Aristotle's works is the critical edition organized by the Prussian Academy of Sciences in Berlin and edited by Immanuel Bekker in 1831. This edition, consisting of two volumes, slightly reorganized the order of the treatises relative to the *Aldina* and resulted from a comparison of the greater number of manuscripts available at that time. However, it retained the same treatises already present in the *Aldina* (including the *Poetics* and the *Rhetoric*), all of which were attributed to the *Corpus Aristotelicum*. The importance of the Bekker edition is reflected in the fact that Aristotle scholars continue to reference its pagination when quoting Aristotle's works. While there is no recent complete edition of Aristotle's Greek texts that has replaced the Bekker edition, various recent editions of specific works offer Greek texts based on the

examination of more manuscripts and an improved understanding of the interdependence between different manuscript families.

The modern reader's comprehension of what qualifies as a genuinely Aristotelian work is thus still fundamentally influenced by the *Corpus Aristotelicum*. In general, it serves as a solid guide for what should be encompassed in a complete works. Nevertheless, the *Corpus Aristotelicum* omits some of Aristotle's works and includes some works that likely were not written by Aristotle himself. Moreover, it is essential to bear in mind that even the works presumed to be authored by Aristotle himself may not be complete, may include redundant parts, or may not have been arranged by Aristotle in the manner in which they have come down to us. All these phenomena can ultimately be traced back to historical contingencies that contributed to the compilation of the *Corpus Aristotelicum*—centuries after the author's passing away and without his explicit endorsement.

2.1. Not Everything Is Included in the *Corpus Aristotelicum*

Our assumptions about what Aristotle might have actually written mainly depend on three types of sources: ancient catalogs of Aristotle's writings, references or quotations from later ancient authors, and Aristotle's cross-references to his own non-extant works. According to all these sources, there were works ascribed to or written by Aristotle that are absent from the *Corpus Aristotelicum*. In numerous instances of works mentioned in the ancient catalogs, we possess only the titles of the lost, supposedly Aristotelian works. In some cases, we can glean clues about the presumed subject matter of the listed works, for example, when ancient authors mention that a specific theme or thesis can be found in a certain work by Aristotle. In more fortunate (albeit comparatively rare) cases, we have substantial accounts of the content of some of the lost Aristotelian works. In certain other instances, we even have verbatim quotations from these works; only the latter case can be termed a "fragment" in the strict sense.

There are three extant ancient catalogs of Aristotle's works,[1] two of which rely on an earlier, one on a later inventory. The earlier inventory that is used by Diogenes Laertius and by Hesychius seems to originate from Hellenistic times, possibly drawn up for the Library of Alexandria, established after the death of Alexander the Great, in the late fourth or early third century BC. The catalog that is presented by Diogenes Laertius as a segment of his biography of Aristotle (5.22–27) mentions 141 titles and often notes the number of books composing each particular work: "*On Justice*: 4 books, *On Poets*: 3 books, *On Philosophy*: 3 books . . . ," and so on. At the catalog's conclusion, Diogenes tallies this to a sum of 445,270 lines—without even mentioning some of the works most cherished by modern readers. (As a comparison, the modern Bekker edition contains around 100,000 lines in roughly 3,000 columns.) Hesychius is the author of another ancient biography of Aristotle, the so-called *Vita Hesychii*, which also includes a catalog

1. These are included in the Catalogs of Aristotle's Writings in Volume 2.

of Aristotle's writings. It confirms many of the titles mentioned in Diogenes, but it also lists some additional titles of works ascribed to Aristotle, amounting to a total of 185 titles. Yet the presence of a title in one of these two lists is not sufficient evidence of the work's authenticity—particularly as these lists might encompass both works by Aristotle and those authored within Aristotle's school. Still, these lists do provide some evidence that the collection featured in the *Corpus Aristotelicum* is far from comprehensive.

Some of Aristotle's lost works mentioned in the ancient catalogs were unmistakably dialogs: *On Philosophy*, *Sophist*, *On Prayer*, *On Rhetoric* or *Grylus*, *On Justice*, *On Love*, and more. Arguably, these were intended for publication and, much like the renowned dialogs of Plato, aimed at engaging a wider audience, possibly for the dissemination of Platonic-Aristotelian doctrines. Assuming that these catered to readers' needs and their limited philosophical expertise, a distinct contrast seems to emerge between them (none of which have survived as a whole), on one hand, and the Aristotelian treatises preserved in the *Corpus Aristotelicum*, on the other. Many texts in the latter group are quite dense and were presumably composed for an expert audience or in a teaching context, making them rather challenging to approach.

Consequently, it has become customary to distinguish between Aristotle's published, exoteric works (which are lost) and the preserved treatises primarily intended for internal academic purposes within a didactic curriculum (also known as "acroamatic," that is, designed for hearing only) possibly never intended for publication.[2] However, this overarching picture demands several caveats. Most notably, significant differences exist regarding the intended readership even within the *Corpus Aristotelicum* itself.

Some writings may have indeed functioned as lecture notes (as is frequently asserted in scholarship, presupposing that readers or listeners were already familiar with specific positions and arguments the text references), other writings adopt a more accessible style (for example, the initial books of the *Nicomachean Ethics*). Others, like Books 7 and 8 of the *Politics*, delve into practical matters—for example, whether settlers should choose coastal or mountainous areas, or discussing the recommended quantity of wine for toddlers—that are presumably of general interest and are, in any case, readily accessible. Throughout his ethical treatises, indeed, Aristotle emphasizes that his intent is not merely to understand happiness and virtue but also to contribute to effective legislation and to facilitate the genuine attainment of virtue and happiness.

Likewise, the *Rhetoric* is not solely concerned with understanding the nature of persuasion but also equips individuals for courtroom defense or successful participation in the citizen assembly. Moreover, although Aristotle's extant works on philosophy of nature envision a comprehensive, coherent project aimed at encompassing nearly all facets of the perceptible and moving world, thus appealing to advanced philosophy students, some of his logical works introduce basic techniques of proof and argumentation and seem more suitable for learners at a foundational level.

2. See Aulus Gellius, *Attic Nights* 20.5.11–12.

In essence, then, while it is true that the treatises included in *Corpus Aristotelicum* are not "exoteric" or "mainstream" in the same sense as the lost dialogs presumably were, yet they are not all alike and do not uniformly cater to purely academic interests.

A considerable number of the lost texts, though they were not published dialogs, do seem more generally accessible. Notably, there is a group deserving special mention: those related to the history of philosophy and the crafts. For instance, Aristotle appears to have composed treatises on the doctrines of the Pythagoreans, Democritus, the Academic philosophers Speusippus and Xenocrates, and Plato's doctrine of eternal Forms. In the latter case, we are fortunate that Alexander of Aphrodisias, the most influential ancient Aristotle commentator, found it beneficial to quote from these treatises in order to shed light on Aristotle's succinct arguments against the assumption of Forms in *Metaphysics* 1. Through Alexander's quotations, we can reconstruct significant portions of Aristotle's lost treatise *Peri Ideôn* or *On Forms* (F172–175), offering insight into how such short treatises might relate to his major works such as the *Metaphysics*.

In this treatise Aristotle appears to compile and systematize arguments used by Plato and Platonists to establish the existence of eternal Forms and Aristotle's objections to them. As a result, Aristotle's refutation of Plato's doctrines in the *Metaphysics* can be concise, only referencing "the arguments from the sciences," "the one over many," and so on, and recalling that these arguments are untenable due to the objections established elsewhere. Consequently, it is possible that some lost treatises on the history of philosophy and the crafts served as material collections for Aristotle, potentially echoing within his extant major works.

2.2. The *Corpus Aristotelicum* Includes More Than It Should

Whereas many of the titles mentioned in the ancient catalogs do not align with any of the transmitted works as we know them, the *Corpus* also incorporates several treatises that seem to be misplaced here. Scholars call these works "dubious" or "spurious," indicating that it is uncertain whether Aristotle actually authored them or that it is relatively clear that he did not. How did these works find their way into it?

First, it is crucial to recognize that even the spurious works are not unrelated to the Aristotelian oeuvre; all of them, to some extent, are connected either to the Aristotelian school or the authentic part of Aristotle's oeuvre. They might have been written by members of Aristotle's school or other Aristotelian philosophers. It is unsurprising that these treatises featured Aristotelian terminology and theories, leading ancient editors to accept them as works authored by Aristotle. Furthermore, it seems that in his effort to construct a comprehensive philosophical worldview, Aristotle assigned various sub-projects to his students. For instance, certain collections ascribed to Aristotle, such as the collection of political constitutions, the compilation of winners' names from the Pythian games in Delphi (F219), and the compilation of rhetorical manuals (F158–163), might have been joint endeavors.

Likewise, some of the spurious works might have emerged from such commissioned or collaborative projects—close enough to be attributed to Aristotle, yet on closer examination, distinctly divergent. Further, some clearly spurious treatises might have been included in the *Corpus* due to their titles being mentioned in the early ancient catalogs of Aristotelian writings (for example, *Mechanics*, *Economics*, *Against the Doctrines of Melissus*, *Against the Doctrines of Xenophanes*, *Against the Doctrines of Gorgias*).

In his extant works, Aristotle refers to a treatise called *Problemata* several times. There are two treatises in the *Corpus Aristotelicum* that could potentially correspond to this reference: *Problemata Physica* and *Problemata Mechanica* (often referred to simply as the *Mechanica* or *Mechanics*). However, both these treatises seem to incorporate later material, probably influenced by Aristotle's student and friend Theophrastus. This explains why an ancient editor might have included them in Aristotle's oeuvre, even though the work Aristotle himself referred to seems to be lost or was never completed.

Another example is the *Rhetoric to Alexander*, a comprehensive manual of rhetoric, whose core tenets are, however, entirely unrelated to Aristotle's own three books on the *Rhetoric*. Ancient editors might have incorporated it due to a faked dedication letter, where the author impersonates Aristotle, dedicating the subsequent book to his former pupil, Alexander the Great.

The enigmatic treatise *On Marvelous Things Heard* oddly present in the *Corpus Aristotelicum* recounts sensational fairy tales (what we nowadays call "paradoxography")—far from Aristotle's sober scientific approach. The point is, however, that some of these tales are derived from Aristotle's *Historia Animalium*, though quoted out of context. The presence of a connection with an Aristotelian treatise might have sufficed for its inclusion in the Aristotelian canon.

How can we identify a work in the *Corpus Aristotelicum* as spurious? The authenticity of many of these suspicious works has always been a topic of scholarly dispute. While debates about authenticity or inauthenticity have been resolved for the most part, a few dubious works still generate ongoing disputes, notably, the work called the *Magna Moralia*, and at times the *Economics* and the *Mechanics* have found advocates for their authenticity.

Scholars rely on clues such as cross-references to or from works believed to be Aristotelian and on terminological and doctrinal consistency with works known to present core Aristotelian doctrines. For instance, the small treatise *On Breath* displays an intimate familiarity with Aristotle's biological theories, yet in some aspects, it posits claims that are in direct conflict with Aristotle's statements elsewhere. The spurious treatise *On Virtues and Vices* presents an Aristotelian list of virtues and was thus included in the Aristotelian canon. However, it reveals its inconsistency by incorporating this list of virtues into the Platonic, not Aristotelian, theory of the soul. The *Magna Moralia* reiterates numerous core doctrines from Aristotle's *Eudemian* and *Nicomachean Ethics*, but a minute detail concerning the Greek dialect within this treatise presents a non-negligible problem: while Aristotle consistently employs the formulation *peri tinos* for "about something," the author of *Magna Moralia* uses the alternative, and likely later,

formulation *huper tinos*, which coincidentally echoes the idiom of Aristotle's student Theophrastus.

2.3. Some Works Might Have Been Differently Arranged

The question of authenticity has to be distinguished from the question of who is responsible for the arrangement and editions of the Aristotelian works as we know them. The *Corpus* presents us modern readers with complex works consisting of artfully connected individual books: the *Prior* and the *Posterior Analytics* consist of two books each, the *Topics* of eight books, the *Physics* of eight books, the *Metaphysics* of fourteen books, the *Rhetoric* of three books, the *Meteorology* of four books, the *Historia Animalium* of nine books, the *Eudemian Ethics* of eight, the *Nicomachean Ethics* of ten books, and so on. More often than not, an individual Aristotelian book that has come down to us as part of a complex work, such as the individual books of the *Metaphysics* or of the *Nicomachean Ethics*, presents a relatively self-contained philosophical unit or, ultimately, a distinctive step within an ongoing agenda—just as the individual chapters in a modern philosophical book are supposed to do (sometimes, however, one unified project extends over more than one book—for example, the treatment of friendship in the *Nicomachean Ethics* covers Books 8 and 9).

In many cases the composition of complex works out of several such individual books makes perfect sense, even though it is likely that the final arrangement of the individual books was the achievement of the ancient editors and not Aristotle's own work. Often the texts of the individual books contain indications about a particular book's standing within a more comprehensive work—for example, they indicate what topic has to be treated next or they refer back to what has previously been established. This is why the ancient editors could not invent major works, such as the *Metaphysics* or the *Nicomachean Ethics*, from scratch, but had to be faithful to the indications given in the Aristotelian texts. Sometimes, though, it seems that there are ill-embedded forward or backward references or editorial signposts—for example, "having dealt with such-and-such," "we have to deal with so-and-so next"—that have not been inserted by Aristotle, but by the editors, thus justifying their independently formed editorial decisions.

Still, even though for the most part the arrangements of individual books were conducted with a view to the philosophical agenda and to indications given in the texts, it seems that there was ample room for editorial decisions and, hence, also for bad decisions. Why, for example, was the *Metaphysics* equipped not with one, but with two introductions, *Metaphysics* 1 and 2? Similarly, *Physics* 1 and 2 could have served as alternative introductions to the study of nature. If one of the two ethical treatises, the *Eudemian* and the *Nicomachean Ethics*, was meant to replace the other, why do they have three books in common? Apparently, this is due to decisions made by ancient editors, who noticed a philosophical lacuna in one of the two treatises and tried to fill the gap by inserting books from the other treatise. Why is it that the *Metaphysics* includes

one book, namely, Book 11, that consists of transcripts and excerpts from other books of the *Metaphysics* and the *Physics*?

There are many such examples in the Aristotelian oeuvre. Sometimes it is the inclusion of a particular book into a more complex work that seems to be suspicious, sometimes our puzzlement concerns the position of a particular book or chapter within a more comprehensive context. Often one gets the impression that the ancient editors were keen to arrange all the thematically related or seemingly related material they received into one and the same work: all the physical texts went into the *Physics*, all political books into the *Politics*, all metaphysical stuff into the *Metaphysics*. This is understandable from the perspective of the ancient editors, since, after all, they did not want to lose or exclude any material they took to derive from the great philosopher.

We have good reason, then, to be cautious in accepting a certain arrangement or order of individual books or chapters, because they might be the result, not of the author's intention, but of an intervention by the editors. However, this does not mean that the transmitted arrangement is merely arbitrary. It often seems, as already indicated, that the individual books fit together in a quite natural way and sometimes it is even indicated in the Aristotelian texts how the several treatises are meant to be interconnected. To some extent, it seems to be a matter of scholarly preferences or changing methodological fashions whether the unity of a complex work or the independence of its individual books and sub-projects is emphasized. At any rate, it is wise to keep in mind that while modern authors have to give their imprimatur prior to the publication of their works, Aristotle never had this opportunity. Most of the works included in the *Corpus* were probably never meant for publication, others might have been a work in progress that was continuously revised, and others were probably left unfinished at the time of Aristotle's premature death. The rest is the work of the ancient editors, which might be considered as both a blessing and a curse.

2.4. The Composition of the *Corpus Aristotelicum*: Hints and Guesses

Who were these ominous ancient editors and how was the *Corpus* compiled? Here are some hints and guesses. The rather uncontroversial part of this story concerns the influence of Andronicus, an Aristotelian philosopher from Rhodes who came to live either in Rome or in Athens. He is traditionally supposed to be responsible, to some extent, for the collection and arrangement of works that make up the *Corpus*.

According to the geographer Strabo (*Geographica* 13.1.54), Aristotle's most important student, Theophrastus, bequeathed his library, which also contained the writings of Aristotle, to his student Neleus. Neleus again sold one part of this collection to the Library of Alexandria, but took the remaining part to Scepsis in Asia Minor, his hometown, where it was kept by some of his descendants. Later, in the early first century BC, this part of Aristotle's writings was sold to the bibliophile Athenian Apellicon of Teos. After the occupation of Athens by the Roman general Sulla (86 BC), the manuscripts were

brought to Rome, where the grammarian Tyrannio (with whom Cicero was personally acquainted) assumed care of them. From Tyrannio they were passed on to Andronicus, as attested by Plutarch (*Sulla* 26) and Porphyry (*Vita Plotini* 24.9–11).

Porphyry credits Andronicus with organizing the transmitted material by collecting related material and distinguishing the several treatises. An additional piece of evidence for the impact of Andronicus is the catalog, preserved only in Arabic, was composed by Ptolemy-el-Garib. Ptolemy claimed that he possessed Andronicus' writings and that his catalog is based on Andronicus'. It seems therefore clear that Andronicus played an important role in the composition or edition of Aristotle's works.

What exactly his contribution to the formation of the *Corpus* was is less clear. However, there is a remarkable difference between the two earlier Hellenistic catalogs, which were prior to Andronicus' intervention, and the later catalog by Ptolemy, which presupposes Andronicus' edition. The earlier catalogs list many titles, but they are silent about some works that are included in our *Corpus*. Most notably, they do not mention Aristotle's biological works (with the exception of *On the History of Animals*). The later catalog of Ptolemy, by contrast, mentions almost all works in our *Corpus* and lists them in a row (29–54) as one coherent block. In addition, it almost always mentions the number of books of each work that we know from our editions.

Given that major works from our *Corpus* were absent from the two earlier lists (by Diogenes and Hesychius) or were not presented as a unit, and given that the later list presents an organized sequence of works that essentially resembles our *Corpus*, it is tempting to think that it was mostly due to Andronicus' intervention that this compilation came about. At any rate, even if we doubt that this was the work of one single editor, we can say that in the second century AD, Alexander of Aphrodisias commented only on those works of Aristotle that are included in our *Corpus*, which seems to indicate, first, that he had a version of this collection that is close to ours, and second, that he regarded the works in it as the most important works (he knew of other works by Aristotle as well, but used them only to shed light on the works included in the *Corpus*). So what we can say is that our *Corpus*, or a version similar to it, was formed between the first century BC and the second century AD—if not by Andronicus alone, then by editors who lived and worked after Andronicus, but before Alexander of Aphrodisias.

The achievement of Andronicus thus probably consists in presenting Aristotle's work as a well-organized system including several thematic groups that somehow build on each other. But he was likely not an editor in the modern sense, in the sense of attempting to provide an authoritative text based on the comparison of all available manuscripts.

It is difficult to get beyond this still relatively meager result. A lot depends on the credibility of the report by Strabo, who wishes to explain the temporary decline of Peripatetic philosophy after Theophrastus' death by the inaccessibility of the Aristotelian writings as well as the renewed interest in Aristotle in his own days by the eventual recovery of his work. In particular, Strabo's claim that Aristotle's main works were kept in a trench in Scepsis and thus became unavailable raises a difficult question: Did the Aristotelians who ran the Peripatetic school in Athens or the Aristotelians on the island

of Rhodes (to which Aristotle's student Eudemus retreated) really not keep any copies of the main works? This is one reason why many scholars find this part of Strabo's report just untrustworthy. Nonetheless, it remains true that the main changes between the ancient catalogs before and after Andronicus concern some of the works of our *Corpus Aristotelicum* that were not even mentioned in the earlier catalogs.

2.5. Bekker's Edition of the *Corpus Aristotelicum*

Immanuel Bekker's first critical edition of Aristotle's works (1831) includes all and only works that were part of the received *Corpus Aristotelicum*. It thus collects the same writings that were already included in the *Aldina*, except, as we saw, that Bekker includes the *Rhetoric* and the *Poetics*, while the *Aldina* did not. Bekker also kept the order of the works that the *Aldina* had used, together with the thematic grouping of Aristotle's works into four or five major thematic blocks:

1. logic and theory of argumentation,
2. philosophy of nature,
3. primary philosophy (metaphysics),
4. ethics and political theory, and
5. rhetoric and poetics (Bekker).

This scheme was essentially predetermined by the order and arrangement of the titles initiated by Andronicus and documented in Ptolemy, the only difference being that in the ancient catalog the fourth and the fifth group (that is, those including ethics, politics, rhetoric, and poetics) were positioned after the logic group and before the philosophy-of-nature group.

The following table lists in order all the writings included in Bekker: works thought to be dubious are marked with †, those thought to be spurious ones with ††. The customary Latinized titles (together with the Bekker pagination) provide an internationally usable system of reference. In most cases the English titles that are nowadays in use are translations or transpositions from the Latin. But it is not clear whether all these titles are Aristotle's, since sometimes the titles are derived from the first lines of a treatise or from their agenda, so that they qualify as proper "designators," but might not have been officially imposed as titles.

The *Organon*: Logic, semantics, theory of argumentation and proof

Categoriae	*Categories*	$1^{a}1–15^{b}33$
De Interpretatione	*On Interpretation*	$16^{a}1–24^{b}9$
Analytica Priora	*Prior Analytics*	$24^{a}10–70^{b}38$
Analytica Posteriora	*Posterior Analytics*	$71^{a}1–100^{b}17$
Topica	*Topics*	$100^{a}18–164^{b}19$
Sophistici Elenchi	*Sophistical Refutations*	$164^{a}20–184^{b}8$

Philosophy of nature

Starting-points of movement and cosmology

Physica	*Physics*	$184^{a}10$–$267^{b}26$
De Caelo	*On the Heavens*	$268^{a}1$–$313^{b}23$
De Generatione et Corruptione	*On Coming to Be and Passing Away*	$314^{a}1$–$338^{b}19$
Meteorologica	*Meteorology*	$338^{a}20$–$390^{b}22$
††*De Mundo*	*On the Universe*	$391^{a}1$–$401^{b}29$

Psychology

De Anima	*On the Soul*	$402^{a}1$–$435^{b}25$
De Sensu et Sensibilibus	*On Perception and Perceptible Objects*	$436^{a}1$–$449^{b}3$
De Memoria	*On Memory*	$449^{b}3$–$453^{b}11$
De Somno et Vigilia	*On Sleep*	$453^{b}11$–$458^{a}32$
De Insomniis	*On Dreams*	$458^{a}33$–$462^{b}11$
De Divinatione per Somnum	*On Prophecy during Sleep*	$462^{b}12$–$464^{b}18$
De Longitudine et Brevitate Vitae	*On Length and Shortness of Life*	$464^{b}19$–$467^{b}9$
De Iuventute et Senectude, *De Vita et Morte*, *De Respiratione*	*On Youth and Old Age, Life and Death, and Breathing*	$467^{b}10$–$480^{b}30$

Biology/Zoology

††*De Spiritu*	*On Breath*	$481^{a}1$–$486^{b}4$
De Historia Animalium	*On the History of Animals*	$486^{a}5$–$638^{b}37$
De Partibus Animalium	*On the Parts of Animals*	$639^{a}1$–$697^{b}30$
De Motu Animalium	*On the Movement of Animals*	$698^{a}1$–$704^{b}3$
De Incessu Animalium	*On the Progression of Animals*	$704^{a}4$–$714^{b}23$
De Generatione Animalium	*On the Generation of Animals*	$715^{a}1$–$789^{b}20$

Dubious or spurious works on the philosophy of nature

††*De Coloribus*	*On Colors*	791^{a}1–799^{b}20
††*De Audibilibus*	*On Things Heard*	800^{a}1–804^{b}39
††*Physiognomonica*	*Physiognomics*	805^{a}1–814^{b}9
††*De Plantis* 1–2	*On Plants*	815^{a}10–830^{b}4
††*Mirabilium Auscultationes*	*On Marvelous Things Heard*	830^{a}5–847^{b}10
††*Mechanica*	*Mechanics*	847^{a}11–858^{b}31
†*Problemata* 1–38	*Problems*	859^{a}1–967^{b}27
††*De Lineis Insecabilibus*	*On Indivisible Lines*	968^{a}1–972^{b}33
††*De Ventorum Situ et Nominibus*	*The Situation and Names of Winds*	973^{a}1–^{b}25
††*De Melisso, Xenophane, Gorgia*	*On Melissus, Xenophanes, and Gorgias*	974^{a}1–980^{b}21

Primary philosophy

Metaphysica	*Metaphysics*	980^{a}22–1093^{b}29

Ethics and politics

Ethica Nicomachea	*Nicomachean Ethics*	1094^{a}1–1181^{b}23
†*Magna Moralia*	*The Great Ethics*	1181^{a}24–1213^{b}30
Ethica ad Eudemum	*Eudemian Ethics*	1214^{a}1–1249^{b}25
††*De Virtutibus et Vitiis*	*On Virtues and Vices*	1249^{a}26–1251^{b}37
Politica	*Politics*	1252^{a}1–1342^{b}34
†*Oeconomica*	*Economics*	1343^{a}1–1353^{b}27

Rhetoric and poetics

Rhetorica	*Rhetoric*	1354^{a}1–1420^{b}4
†† *Rhetorica ad Alexandrum*	*Rhetoric to Alexander*	1420^{a}5–1447^{b}7
Poetica	*Poetics*	1447^{a}8–1462^{b}18

2.6. Writings That Did Not Make It into Bekker's Edition

What has not been transmitted as a complete treatise within the *Corpus* was not included in Bekker's edition. The rest of Aristotle's (mostly lost) writings are traditionally treated as fragments. Collecting and editing these is less straightforward than editing writings included in the *Corpus*, for it is often controversial which reports by later authors should be taken as genuine and which can qualify even as verbatim quotations. Also, the number of references to Aristotle's works in antiquity is quite extensive. Where to start and where to end?

Nonetheless, after the completion of Bekker's edition, the Prussian Academy in Berlin offered a research award for the best study on Aristotle's fragments (although the collection of Aristotelian fragments was no longer uncharted territory by this time: the Istrian humanist Franciscus Patricius published the first systematic collection of Aristotelian fragments as early as 1571).

In the competition that followed, the librarian Valentin Rose, the author of a doctoral thesis from 1854 that tried to prove that all the reported or fragmentary works not included in the *Corpus Aristotelicum* are spurious, won the first prize. It was titled *Aristoteles Pseudepigraphus* and included a preliminary collection of Aristotelian fragments, although the author repeated and reinforced his old thesis that all the treatises to which these fragments are assigned are spurious. The printing of this treatise was financed by the Prussian Academy in 1863 and is known as R^1.

Although Immanuel Bekker and other members of the editorial board disagreed with Rose's main thesis, they printed an abbreviated version of his collection of fragments in the fifth volume of the Academy edition (in addition to the two volumes that include Bekker's edition, the third and fourth volumes were dedicated to the Latin translation of Aristotle and to the scholia, that is, short commentaries from the margins of the manuscripts). This fifth volume was published in 1870 and is referred to as R^2. In order to document his skepticism, Rose called his work *Aristotelis qui ferebantur librorum fragmenta*—"fragments of books which were transmitted as Aristotelian works." Between the competition and publication of the fifth volume of the Academy edition, Emil Heitz, the person who was ranked in the competition behind Rose, had published a (quite plausible) refutation of Rose's claims about the inauthenticity of the lost works assigned to Aristotle and had published his own collection of the fragments in France.[3] Finally, Rose published an improved and separate edition of the fragments in the more easily accessible *Teubneriana* series. It was published in 1886 and is referred to as R^3. There is a certain irony in the fact that the most famous editor of Aristotle's fragments, who dedicated most of his scholarly life to this topic, never believed in the authenticity of what he collected.

More recently, scholarship has focused on selected lost or recovered works that seem to be particularly rewarding from a philosophical point of view. Three or four examples deserve to be highlighted. An important addition to the metaphysical treatise preserved in the *Corpus Aristotelicum* is the small treatise *On Forms*, important parts of which could be reconstructed from ancient commentaries on Aristotle's *Metaphysics*, in particular from Alexander of Aphrodisias. The retrieved text turned out to be one of the most significant testimonies for the Academic discussion about Plato's assumption of eternal Forms.

Another example of indirect transmission is Aristotle's *Protrepticus*, an exhortation to philosophy, in which Aristotle promotes the benefits of philosophy as he understands it. This is one of the few examples of how an exoteric Aristotelian text, one that

3. *Fragmenta Aristotelis*, collegit disposuit illustravit Aemilius Heitz (Paris, 1869).

explicitly addresses a broader public, might have looked. An important source for the reconstruction of this text is Iamblichus, who lived in the third and fourth centuries AD. Iamblichus compiled exhortative arguments from several authors without indicating which particular author he is referring to or quoting from. In 1869 Ingram Bywater first formulated the thesis that major parts of Iamblichus' *Protrepticus* were taken from Aristotle.[4] Even though Bywater's thesis has been largely accepted and the *Protrepticus* has been widely acknowledged as a quotable work of Aristotle's (in addition to the fragments edited by Rose), it is also an example of how difficult it is to reach scholarly agreement on the detailed reconstruction of a lost treatise, for it turned out to be notoriously difficult to determine which particular arguments in Iamblichus were taken from Aristotle and which were not.

A rather intricate and, to some extent, disappointing example of the hunt for Aristotelian fragments is provided by Aristotle's announced treatment of comedy. Aristotle himself refers several times to his discussion of the comical and laughable, but his *Poetics*, as it has come down to us, includes only a treatment of epic and tragedy. We have to conclude, then, that the *Poetics* originally included a second book (which is mentioned in Diogenes' catalog) which included an extended discussion of comedy, but that this second book is lost. That of all Aristotelian writings the treatment of the comical and of laughter is lost has been the stuff of crime stories and conspiracy theories. Scholars kept browsing ancient texts for hints on Aristotle's views about comedy. A manuscript from the tenth century AD, commonly referred to as *Tractatus Coislinianus* (F167), was suspected of including a summary of Aristotle's theory of the comedy, but no scholarly consensus has been reached.

While in the case of the other lost works of Aristotle scholars count themselves lucky when they are able to identify one or a few genuinely Aristotelian lines in later works, it was possible to regain almost the entirety of the treatise *The Athenian Constitution* from papyri found in the late nineteenth century (and, hence, after Rose's edition of the fragments). In this treatise the author gives a historical and systematic description of the development of the constitution of Athens down to Aristotle's time. Most likely this treatise was part of the collection of 158 constitutions mentioned by Diogenes Laertius and by Aristotle himself (*NE* 1181^{b}15–24) as a starting point for his own philosophical inquiry into political constitutions in the *Politics*.

The case of *The Athenian Constitution* is unique: not only is it the longest continuous text from the supposedly Aristotelian writings that were not transmitted within the *Corpus Aristotelicum*, it is also the only text under the name of Aristotle that is directly edited from an ancient papyrus. It still might be, however, that this treatise was compiled not by Aristotle himself, but by members of the Aristotelian school as part of the more comprehensive project of collecting constitutions from various cities. Indeed, scholars have observed in this treatise traces of what they took to be stylistic and terminological differences to other Aristotelian works. Besides, it has always been suspected that it was

4. "On a Lost Dialogue of Aristotle," *The Journal of Philology* 2 (1869): 55–69.

simply impossible for one single person (even for a person as prolific as Aristotle) to draft the collection of all 158 constitutions by himself.

3. Aristotle's Philosophical Oeuvre: A Survey

The most amazing thing about Aristotle is the fact that his philosophy is not centered on one specific thesis or one specific field—or even a few of them—but combines topics as divergent as logic, zoology, meteorology, political theory, and metaphysics, to mention just a few examples. His achievements in these various fields are quite different in character and cannot be subsumed under one particular slogan or claim. This first impression seems to comply with what Aristotle himself thought about philosophy and the sciences, namely, that distinct parts of philosophy and distinct sciences differ in accord with their specific subject matter and require different standards of exactness. He programmatically objected to attempts of some of his predecessors to sketch a grand unified discipline that is supposed to incorporate scientific knowledge of all possible subject matters alike. Accordingly, Aristotle's own philosophy and scientific research are subdivided into different and more or less independent fields; and it is not by chance that these different fields are characterized by different kinds of findings and philosophical methods.

In order to get a first synoptic view, it is useful to follow the traditional subdivision of Aristotle's oeuvre (Section 2 above), which distinguished roughly between logic, philosophy of nature, metaphysics, ethics and politics, and, somewhat awkwardly, rhetoric and poetics. To some extent, this division is backed by what Aristotle himself says, when he distinguishes theoretical, practical, and productive sciences (*Met.* 1025^{b}25, *NE* 1139^{a}27–28, *Top.* 145^{a}15), if we suppose that philosophy of nature and primary philosophy are both theoretical, ethics and politics practical, and rhetoric and poetics productive sciences or crafts. Aristotle also acknowledges that theoretical science can be further subdivided into, roughly, the study of nature, dealing with what is movable and has matter, and the study of what is neither movable nor has matter, which, according to Aristotle, falls to mathematics (whenever these objects are ontologically dependent) and to primary philosophy (whenever these objects are ontologically independent).

Philosophy of nature, broadly conceived, makes up almost the half of the *Corpus*. It might be further subdivided into, first, the *Physics* and all treatises that deal with the superlunary natural world, the atmosphere, and the elements; second, the works that deal with psychology, that is, the soul and psychic capacities and functions that are common to body and soul; and, third, Aristotle's biological work, which, taken by itself, makes up almost one-quarter of his transmitted work.

While Aristotle does not have a single word for what we call "logic," he acknowledges that some of his treatises are topic-neutral and have no definite subject matter, so

that they are not captured by the scheme of theoretical-practical-productive. These are the treatises included in the *Organon*.

3.1. The Works Traditionally Assigned to the *Organon*

The group of treatises that is printed first in all editions of Aristotle's works is traditionally called the *Organon*, which means "instrument" or "tool," in the sense of an instrument for or propaedeutic to philosophy and science. It comprises six treatises: the *Categories*, *De Interpretatione*, *Prior Analytics*, *Posterior Analytics*, *Topics*, and *Sophistical Refutations*. All these (with, at least, one notable exception) deal with arguments and argumentation. Since the Greek word for argument is *logos*, the treatises in the *Organon* might be called "logical" in the broad sense of "pertaining to arguments and their elements," but not all of them pertain to formal logic. Likewise, since the treatises of the *Organon* present different methods of inquiry related to the different types of arguments (for example, the method of dialectic related to dialectical and the scientific method related to scientific arguments), they are often described as methodological.

That is what most scholars can easily agree on. The problem is that Aristotle himself does not refer to the subject of these treatises in such terms. For though he is the inventor of the first system of formalized logic, he does not have the notion of logic either in the broad or in the narrow sense. In one passage (*Top.* $105^{b}19$–25) he says that all premises and problems discussed in a dialectical disputation are either natural-scientific, ethical, or "logico-linguistic," which, at first glance, looks very much like the Stoic division of philosophy into physics, ethics, and logic. However, the sole example here of a logico-linguistic problem is whether or not there is one single science of each pair of contraries. And this clearly shows that it is not our notion of logic he has in mind.

One must also keep in mind that the label *Organon* for these works is a later invention and reflects the views of later ancient Aristotelians who opposed the Stoic idea that logic is one of the three parts of philosophy (see Diogenes Laertius 5.28). This concept of an *organon* suggests that the inquiries in these treatises are (just) propaedeutic to what Aristotle is doing in his own scientific and philosophical works. In some respects, this would have been acceptable to him. Most notably, in the *Posterior Analytics* he formulates his conception of a scientific proof and, even though it is not always easy to detect explicitly formulated proofs in his scientific works, modern scholars have made great efforts to show that parts of his scientific treatises do aim to formulate such proofs. In this respect it is simply true that the inquiry into scientific proofs as such is meant to be preparatory and propaedeutic to the practice of Aristotle's own scientific-philosophical research (and, perhaps, by his lights, to any future research). It is in the same spirit that, for example, the Neoplatonic schools of late antiquity used the *Organon* for introducing students to the method(s) of philosophizing quite generally.

Aristotle himself also occasionally appeals to the idea of a scientific-philosophical propaedeutic. This is concealed in what he says about *paideia*, a general form of educatedness with regard to sciences and the use of proofs, and so forth (see *PA* $639^{a}4$–6,

NE 1094^{b}23–27, *Met.* 994^{b}32–995^{a}17, 1005^{b}2–5). He distinguishes this general educatedness from accomplishments in particular sciences; the failure to be educated in this way is manifest in the tendency to demand proofs for what cannot be proved or to demand a degree of precision that is unreachable in a given domain—for example, looking for mathematical exactness in the study of human affairs. Arguably, it is the study of certain parts of the *Organon* that can prevent people from committing these mistakes.

It would thus not be outlandish for Aristotle to regard (parts of) the *Organon* as propaedeutic for what he is ultimately most interested in: moral philosophy, philosophy of nature, and primary philosophy. Still, the idea of being "merely propaedeutic" or "merely instrumental" to something else includes a value statement about the allegedly inferior status of the studies contained in the *Organon* that Aristotle himself nowhere explicitly makes. And modern scholars, who regard, for example, Aristotle's invention of syllogistic logic in the *Prior Analytics* as his most remarkable (and, perhaps, least controversial) achievement, would be particularly reluctant to accept such a derogatory statement.

How else can we account for the unity of the various sub-projects of the *Organon*? As we saw, the occupation with arguments seems to provide a common thread to (most of) these treatises. Arguments, Aristotle states, are either inductive or deductive (*Top.* 1.12). An inductive argument proceeds from particulars to something general (105^{a}13–16): if, for example, the pilot who has knowledge is the best (pilot), and the charioteer who has knowledge is the best (charioteer), then generally the one who has knowledge (in each field) is the best. A deduction, by contrast (*Top.* 100^{a}25–27, *APr.* 24^{b}18–20), is an argument in which certain things being assumed (the premises), something different (the conclusion) follows by necessity through the assumed premises. This latter type of argument receives the greatest attention not only in the *Prior* and *Posterior Analytics*, but also in the *Topics* and the *Sophistical Refutations*. It is regularly illustrated by the following example: all humans are mortal; all Greeks are humans (premises); therefore, all Greeks are mortal (conclusion). Deductive arguments of this form have come to be known as "syllogisms," which is the anglicized version of the Greek *sullogismos*.

It is common to all well-formed syllogisms that the conclusion follows from the assumption of the premises alone. By looking into the premises of such arguments and, in particular, their epistemic status, one can derive an important classification of all syllogisms. Suppose that the premises of an argument express views that are not (yet) firmly established but are accepted either by all or by many or by the most renowned experts (which is to say that they are "acceptable beliefs"). In this case, Aristotle stipulates, the argument is dialectical. If, by contrast, the premises are (established as) true and primary in the sense that they are credible in themselves and do not receive their credibility through anything else, then the argument can qualify as a demonstration or scientific proof, conveying genuine knowledge.

Dialectical arguments, on the one hand, and demonstrative arguments, on the other, are indicative of two main branches of inquiry that Aristotle defines: dialectic, which serves to examine opinions on all subject matters (systematically developed in Aristotle's

Topics), and scientific argumentation, which is meant to account for certain regularly occurring phenomena by relating them to their specific explanatory starting-points (most explicitly developed in the *Posterior Analytics*).

This latter demonstrative method is grounded in Aristotle's notion of unconditional scientific knowledge, according to which we know each thing when we know the cause due to which it is necessarily the case (*APo.* 71^{b}9–12). The demonstration refers the phenomenon to be known (mentioned in the conclusion) back to the starting-points (mentioned in the premises) that give us the explanation for why the phenomenon in question is the case. Often, in his scientific work, Aristotle aims, for example, at demonstrating that certain intrinsic coincidents (often referred to as "*per se* accidents") belong to a certain class of subjects either in virtue of the nature or essence of the subjects in question or in virtue of the affections' nature or essence. Once this has been demonstrated, one knows why it is the case that these particular types of affection belong to this particular type of subject and that the former belong to the latter by necessity.

We thus see the major division between dialectical and demonstrative arguments, which is important not only for the structure of the *Organon* but also for Aristotle's scientific and philosophical methods in general. Such arguments are genuine syllogisms, meaning they actually deduce what they claim to deduce. In contrast, when arguments appear to be deductions but fail to deduce what they seem to, they are fallacies. Aristotle studies these in the *Sophistical Refutations*. A particular claim (or the person making the claim) is refuted when the contradictorily opposed claim is successfully deduced. Some people (whom Aristotle calls "eristic" or "sophistical") specialize in refuting ordinary people's claims or convictions with questionable arguments, that is, by refutations that only appear to deduce the opposite of the original claim. In *Sophistical Refutations*, Aristotle identifies thirteen types of fallacies corresponding to thirteen ways of failing to be a genuine deduction. For example, an argument fails to be a genuine deduction when it uses the same word in the premises and the conclusion but with different meanings. Dialectically inexperienced addressees might fail to notice the ambiguity and hence be misled into thinking that they have been genuinely refuted.

What, then, is common to all genuine syllogisms, that is, all those whose conclusions actually follow by necessity from the premises assumed? Aristotle's great logical innovation, known as "syllogistic theory," is to provide a general scheme by which it is possible to distinguish valid from invalid deductive arguments. This is found in his *Prior Analytics*. According to it all syllogisms consist of three assertions—two premises and one conclusion. Each assertion is of the form "S is P" or "P belongs to S," and thus involves exactly two terms. A syllogism only comes about if the two premises have one term in common, the so-called middle term, while the conclusion involves the two other terms introduced by the premises: "A belongs to every B"; "B belongs to every C"; thus "A belongs to every C." Depending on the position of the middle term, Aristotle defines three syllogistic "figures." In the example mentioned, the middle term is first in the subject-position and then in the predicate-position, and hence belongs to the first figure. When, by contrast, the middle terms are in the predicate-position or in the

subject-position, the syllogism is in the second and in the third figure, respectively. In accord with the quantity of the assertions involved (whether A belongs to every or only to some B) and whether they are affirmative or negative (A belongs to every B, A belongs to no B; A belongs to some B, A does not belong to every B), Aristotle defines for each figure the available valid modes. For example, if "smart" belongs to every philosopher and "philosopher" belongs to some authors, then "smart" belongs to some (but not to all!) authors. Also, he develops several tools for demonstrating the validity of valid modes. This is the core idea of what is known as Aristotle's "assertoric syllogistic." In addition, he developed a theory of syllogisms that are modally qualified: "A necessarily belongs to every B," "B possibly belongs to some C."

Aristotle claims that all genuine syllogisms can be traced back to the syllogistic figures (and the valid modes within them). But, as a matter of fact, many of the arguments he presents (even within the *Organon*) are not in syllogistic form as they stand, even though they seem to be proper deductive arguments. Perhaps they must be rephrased in order to show that they are exemplifications of one of the syllogistic figures and modes. Nonetheless, it is still remarkable that certain treatises in the *Organon*, in particular the *Topics* and the *Sophistical Refutations* (perhaps together with the *Rhetoric*), though dealing with deductive arguments, are totally unconcerned with syllogisms of the canonical form we looked at.

This poses a puzzle for the unity and coherence of the *Organon*. If syllogistic theory was indeed Aristotle's biggest innovation in the field of logic, why are some of his works completely silent about it? This is one of those occasions on which modern Aristotle scholars start flirting with so-called developmental hypotheses, by postulating philosophical development on Aristotle's part in order to account for what they take to be inconsistencies in his oeuvre. In the given case, one might hypothesize that certain works were completed before he invented the syllogistic theory and that he afterward failed to revise them in light of the new discovery. This is one way to deal with the puzzle. Alternatively, it has been suggested that those treatises—regardless of when they were composed—could easily do without syllogistic theory owing to their peculiar purpose, which is different from the one of the *Prior Analytics*. For a long time, for example, interpreters have assumed that the method provided by the *Topics* just serves the (heuristic) purpose of finding arguments and, in particular, suitable premises.

What about the two remaining treatises, the *De Interpretatione* and the *Categories*? *De Interpretatione* is mostly concerned with what makes up assertoric sentences, affirmations and negations, their quantities, and the fact that they are contradictorily opposed. It formulates the important rule that of the two members of a contradictory pair (affirming and denying the same predicate of the same thing), one has to be true and one has to be false. Since these statements are of the same form as the premises and conclusions of a canonical syllogism, it seems natural to infer that, while the *Prior Analytics* is concerned with syllogisms, the *De Interpretatione* provides the theory of the parts of a syllogism. A similar argument has been made with regard to the *Categories*. Its core project consists in assigning each unconnected part of a proposition to one of

the ten so-called categories, that is, types of predications (and, elsewhere, also types or classes of being): what-it-is, quantity, quality, relative, when, where, position, having, doing, and being affected. While *De Interpretatione* deals with assertions, one might infer, *Categories* deals with the parts of the assertion, its terms. However, this latter claim is much more contested. For one thing, the division of the categories plays no role either in the account of assertions in *De Interpretatione* or in the theory of syllogism in *Prior Analytics*. Also, the *Analytics* provide their own account of the terms included in premises—and this account ignores the ten categories.

That is why the systematic place of the *Categories* has been a matter of dispute since the time of Andronicus (Section 2 above). Just to illustrate the problem: On the one hand, the division of the ten categories may serve as an analytic tool for assessing and criticizing competing theories—for example, someone might treat a quality (saying what something is *like*) just like a kind (saying *what* something is). This fits well with the dialectical approach of the *Topics*. For this reason, the *Categories* have been thought to be somehow attached to the *Topics*, and, as we saw, there are ancient sources using the title *What Comes before the Topics* instead of *Categories*. On the other hand, the *Categories* make some not insignificant claims, for example, about the priority of particular substances and about universals that exist only if they are instantiated or exemplified by particular substances. These are the sorts of claims that, in principle, are dealt with in Aristotle's *Metaphysics*. Still, as opposed to the *Metaphysics*, the *Categories* makes such claims as it goes along, does not argue for them, does not mention competing options, does not discuss starting-points and causes, and fails, like other treatises in the *Organon*, to speak of matter and form. It thus seems to be written in the spirit of the *Organon*—even though its exact place within this collection remains obscure.

3.2. The *Physics* and the Foundations of the Study of Nature

A considerable part of Aristotle's transmitted work is dedicated to the study of nature. The study of nature, broadly conceived, includes the discussion of discrete natural phenomena, such as celestial bodies, sublunary elements, or living beings, but also attempts to address notions fundamental to the study of nature in general. Most of Aristotle's *Physics* is dedicated to the latter project, in that it deals with the starting-points of nature and of change and movement, causality, and concepts such as nature, movement, the infinite, place, the void, time, and the continuum.

It is easy to see why a theoretical grasp on these notions might inform the study of particular natural phenomena. At the same time Aristotle's *Physics* does not confine itself to laying the foundations for studies of particular types of phenomena, but also makes and defends substantial philosophical claims connected with these notions. For example, Aristotle asserts that there is no void, that there is no actual infinite extension, that there must be an immovable mover, and so on. While, for example, Book 1 of the *Physics* accounts for the starting-points of change, by providing a scheme that can be applied to all sorts of change, and Book 3 provides a definition

applicable to all of them, Book 8 defends some of Aristotle's core doctrines about spatial movement in particular.

These doctrines include the ideas that whatever is moved is moved by something else, that each series of movers must start from something unmoved, that to guarantee eternal movement in the cosmos there must be an eternal unmoved mover, that spatial movement is primary compared to other kinds of change, that circular movement is primary among all sorts of spatial movement, and so on. These are important results for Aristotle and not just preliminaries or conceptual tools for other inquiries.

Scholars are sometimes puzzled about how to subdivide the eight books with a view to these two different directions of inquiry. Some ancient commentators have suggested ascribing the first four books to the inquiry into starting-points and the last four books to a treatise on movement, while others identified the breaking point after Book 5 and again others after Book 6 (it is agreed that the position of Book 7 within the *Physics* is doubtful, as it seems to be an independently drafted piece on topics related to it). Regardless of these subdivisions, the following are perhaps the most famous examples of how the first two books might be seen as the foundation of the study of nature.

Physics 1 announces without much introduction that it will deal with "the starting-points and causes" in the study of nature. Chapters 4–7 provide, as we saw, a set of starting-points by which it is possible to conceptualize all sorts of movement or change, thus presupposing that studying nature means studying changeable things. In each instance of movement one can distinguish a new feature that comes to be present, the opposite feature which is replaced by it, and a substrate that underlies the change (and persists through this replacement). In the case of the generation of a substance, Aristotle calls these items "form," "privation," and "matter," and it is the form and the matter that, fundamentally, qualify as the starting-points of natural substances. This is a basic tenet of the hylomorphism and pervades Aristotle's philosophy of nature and (parts of) his metaphysics, namely, that all changeable substances consist of matter and form.

Thus, if a house is to come to be, one has to assume the form of the house, its absence or privation, and something that underlies it. The generation of a house, then, proceeds from the absence of house form to the presence of the house form, and the substrate that undergoes this change (by taking on a substantial form that it did not possess before) is the matter of the house, say the bricks and stones of which the house is made. Once generated, the house therefore consists of matter and form. This hylomorphic analysis is essential for what philosophers of nature are doing and delineates their domain of study. For they are dealing with objects whose forms are necessarily "enmattered" and cannot be separated from the matter in which they occur. Aristotle often compares this to the snub, which is a concavity that occurs only in noses and in nothing else. By contrast, geometers are in some sense dealing with, for example, lines that happen to be the limits of natural bodies. But more precisely, the genuine objects of their study are lines that are abstracted away in thought from such bodies.

Physics 2 defines what "nature" means, namely, an internal starting-point of moving and being at rest, and then develops the famous division of the four types of causes,

which correspond to four different answers to a why-question. For, as Aristotle says, we do not claim to know something before we have the why or cause of it. In one way, this question can be answered by stating that from which a thing comes to be (like the bronze from which the statue comes to be). This is the material cause. In another way, it can be answered by referring to a form or paradigm, which can be captured by a definition. This is the so-called formal cause. In still another way, one might refer to the primary source of movement or rest (for example, the sculptor is the source of movement for the coming to be of a statue). This is the so-called efficient cause. Finally, one might refer to the end or purpose for which something is done—for example, when we are asked why we go for a walk and say "in order to be healthy." This is the final cause.

In his survey of the theories of previous philosophers of nature, Aristotle several times concludes that they failed to adequately account for the formal cause and incorrectly rejected the final cause. He argues that it is not possible to account for the regular and purposeful processes of coming to be and arrangements of natural things by relying on material and efficient causes alone. How can we explain, for example, that many animals grow sharp teeth at the front of the jaw and flat molars further back? Without assuming final causes, or so Aristotle argues, one would have to say that this comes about coincidentally or by luck. But this would not be sufficient to explain why this occurs always or for the most part. In Aristotle's theory of explanation, by contrast, it is plain that teeth grow this way for a purpose: the sharp teeth at the front are useful for biting off food, while the molars in the back are useful for grinding food. It is in accord with this scheme that Aristotle explains many natural phenomena.

3.3. The Study of Nature: Aristotle's Grand Plan and How It Is Executed

In *Meteorology* 1.1 Aristotle formulates a grand research plan for the study of nature, which is a good starting point for exploring the structure of his philosophy of nature:

> [1] The primary causes of nature, all natural movement, [2] the stars arranged in the upper spatial movement, [3] and the elements of bodies, how many they are and of what sorts, the change into each other, [4] and coming to be and passing away in general, have been spoken about previously. [5] It remains, then, to get a theoretical grasp on a part of this methodical inquiry, which all our predecessors have called "meteorology." It is concerned with whatever things happen in accord with nature, but a nature more disorderly, certainly, than the primary element of the bodies, and which occur in the place nearest to the spatial movement of the stars—for example, the Milky Way, comets, shooting stars, and moving and burning phenomena. It is also concerned with whatever affections may be regarded as common to air and water, and further the parts and forms of earth and the affections of the parts, on the basis of

> which we may get a theoretical grasp on the causes of winds, earthquakes, and whatever occurs in accord with their movements. [. . .] Further, it is concerned with the fall of lightning bolts, tornadoes and fire-tornadoes, and whatever other recurrent affections of these same bodies as are due to solidification. After we have discussed these things, [6] let us then get a theoretical grasp on whether we can give some account, in the way we have laid down, of animals and plants, both universally and separately. [7] For when we have stated it, all of what we deliberately chose for ourselves at the start would pretty much have reached its end. (*Mete*. 338^{a}20–339^{a}9)

Aristotle refers here to projects that correspond to some of his works on philosophy of nature, and he indicates in [7] that this project can claim some sort of exhaustiveness or completeness. Though the plan suggests a certain order among these works, this order need not be understood as a chronological order of the works' composition. It is much more likely that he wants to accommodate the new project he announces, that is, the so-called meteorology, into a system of sciences. The order of these, which is quite likely the order in which they should be studied, is determined in part by the fact that certain fields presuppose or depend on others, in that the things treaded in these fields are causally influenced by things treaded in another field. This is most obvious with regard to [1], referring to the *Physics*, which, as we saw, deals with the starting-points in the study of nature and with movement and change in general.

Section [2] introduces the sort of research that is carried out in *De Caelo* or, more precisely, in the first two books of it. These books deal with the cosmos as a whole (for example, showing that it is one and spatially limited), with the planets and stars, and with the earth. Pride of place is given to the matter of the celestial bodies, and it is argued that they cannot consist of the ordinary, sublunary elements, earth, water, air, and fire. Rather they consist of a fifth element which has a natural tendency to move in a circle. Books 3 and 4 go beyond the content he announces in section [2]. Book 3 introduces problems concerning generation and then focuses on the sublunary elements, while Book 4 deals with the heavy and the light (which are, at least, affections of the elements). The study of elements is an essential piece of Aristotle's philosophy of nature that clearly deserves its own treatise. Book 3 might be thought to deliver a part of this treatise, namely, the one on sublunary elements, Book 1 having dealt with the celestial, superlunary element.

Section [3] of the grand plan might hence either refer to *De Caelo* 3 or to *On Coming to Be and Passing Away*, a major part of which is indeed dedicated to the discussion of elements and in particular to the mutual transformation of elements that is also announced in [3]. The relation between these two works is difficult to account for, since it is not the case that *On Coming to Be and Passing Away* is merely the continuation of the discussion started in the *De Caelo.* (A further treatise of elements, their qualities and mixtures is given in *Meteorology* 4.) It is pretty likely, though, that section [4] of the grand plan refers to *On Coming to Be and Passing Away*, because in this treatise the elements are discussed against the background of a general explanation of unconditional

coming to be and passing away, that is, of substances, as opposed to mere alteration and other non-substantial changes.

Section [5] gives us a succinct summary of the main topics of *Meteorology* 1–3. The phenomena discussed there—as multifarious as they may be—fill the space between the celestial sphere and the earth (including some geological phenomena beneath the earth's surface, such as earthquakes). This intermediate position of the so-called meteorological phenomena is echoed in the sketched order of study, as the *Meteorology* comes after the study of the heavens and before the biological research that is announced in section [6]. This top-down progression is obviously intended.

One reason for this direction of research might be a certain causal or explanatory order, in that the celestial sphere clearly has an impact on what happens further down, especially in the region nearest to the movement of the stars. Similarly, concerning the discussion of elements (in *De Caelo* 3 and *On Coming to Be and Passing Away*) in relation to the agenda of the *Meteorology*, the point seems to be that the affections and capacities of sublunary elements will enter into the explanation of phenomena that it deals with. It is less clear why the study of living beings has to come afterward. But given that they live on earth (broadly speaking), they are to some extent influenced by phenomena that happen "above" them, most notably, by the course of the sun, the change of seasons leading, for example, to hibernation and migration, to growth in spring and decay in fall. But, of course, these are not the only starting-points in the study of living beings.

3.4. The Study of the Soul and of the Psychic Functions That the Soul Accomplishes Together with the Body

Aristotle's treatise *De Anima* is dedicated to a highly ambitious project. When Aristotle says in *DA* 1.1 that reaching reliable conviction about the soul is most difficult, he seems to mean it. Since the soul is the starting-point of all living beings, the treatise suggests itself as a foundational work relative to all other treatises that deal with living beings in one way or the other. Accordingly, the first chapter of *De Sensu*, the first treatise in the collection called the *Parva Naturalia* (*Short Works Pertaining to Nature*),[5] makes it clear that "what has been said about the soul . . . is to be assumed throughout" (436^{a}5), thus presenting its own project as a continuation of the *De Anima* project that makes use of the starting-point or starting-points laid down there.

The core purpose of the *De Anima* itself is to understand what the soul is and to get clear about its intrinsic coincidents (or "*per se* accidents"). Even this core project faces difficulties and challenges, some of which are immediately addressed in its first chapter. One set of difficulties is connected with the phenomenon that the soul is thought to have different parts, which seems to pose a challenge, among other things, for the unity

5. The other treatises in the first section are *On Memory and Recollection*, *On Sleep and Waking*, *On Dreams*, *On Prophecy during Sleep*, and in the second section, *On Length and Shortness of Life* and *On Youth and Old Age*, *Life and Death, and Breathing*.

of the underlying subject. More than that, one of these parts, the understanding, seems to provide such significant anomalies (most notably, it is not mixed with the body and has no organ) that it is genuinely unclear whether it can be dealt with by the part of philosophy of nature that deals with living beings. Connected with the issue of parts of the soul is an initial uncertainty about the extension of the treatise's subject matter, since previous philosophers unduly restricted the study of the soul to the study of the human soul and Aristotle is determined to overcome this—as he thinks—misleading restriction.

Due to its having different parts as well as other peculiarities, Aristotle seems to think that it is difficult to determine the what-it-is of the soul. One issue is to find the appropriate level of generality. When it comes to Aristotle's own definition of the soul in *DA* 2.1–3, he first gives an ontological classification of the soul, saying that it is in the category of substance; that, according to the scheme of the three modally defined types of substances distinguished in the middle books of the *Metaphysics*, it belongs to the form-like type of substance; and that it is on the side of actuality rather than mere potentiality, though a sort of actuality that can be more fully actualized. In the ensuing discussion, however, it quickly becomes clear that this "common account" is insufficient: it cannot adequately capture the distinctive forms of life that characterize different classes of living beings, whose starting-points of life (that is, souls) are distinct. In *DA* 2.3 he famously suggests that "it is ridiculous to inquire after a common account" of the various sorts of soul, such as nutritive and perceptual soul, "when it is an account that will not be special to any being, and will not be in accord with its proper indivisible form, to the neglect of the one that is of this sort" ($414^{b}25$–29).

Another issue is the relation between the what-it-is of the soul and its intrinsic coincidents. In a remarkable passage (*DA* $402^{b}16$–22), likely motivated by the difficulty of defining the soul, Aristotle makes the point that it is not only the case that we need the what-it-is in order to account for its intrinsic coincidents, but rather it is likewise true that a grasp of these coincidents might help us to track the what-it-is, in that we have to look for the what-it-is by inquiring into how a given set of them can best be accounted for. At the very least, this suggestion concerns the question of how a suggested what-it-is of the soul can be assessed and how its explanatory powers can be put to the test. This method seems to redirect attention to the intrinsic coincidents of the soul. However, with regard to the so-called affections of the soul we must confront the often-quoted problem (*DA* $403^{a}4$–10) that most of them do not seem to belong to the soul exclusively, but also (and perhaps more properly) to the living being, for the soul suffers or initiates none of its affections and works without the body (*DA* $403^{a}10$–11).

The precise implications of this claim are a matter of scholarly dispute. However, it seems uncontroversial that this phenomenon presents a challenge to and, perhaps, a limitation on a treatise that is dedicated to the study of the soul *as such*—since, as we saw, the beginning of the *De Sensu* refers back to *De Anima*. If the *De Anima* is restricted to the discussion of the soul as such, how specific can it get with regard to each of the types of life and, in particular, with regard to affections and activities that may come

about through the soul, but are strictly speaking affections and actions of the composite (the living being)?

This degree of specificity might concern the completeness and differentiation of the treatment of activities coming about through the soul, on the one hand, and the level of detail at which each is discussed, on the other. In the former respect not all of the activities of living beings that the first section of the *Parva Naturalia* deals with play a role in the *De Anima* (for example, sleeping, dreaming, memory); in the latter respect the *Parva Naturalia* can pick up topics that have already been discussed in the *De Anima*, but only in universal terms (for example, in *De Sensu* 3, Aristotle resumes the discussion of objects of perception that have been treated in such terms in the *De Anima*, namely, with regard to their function and the actuality of each of the perceptual organs).

Insofar as the discussion in the *De Anima* is retrospectively characterized as a study of the soul and its affections and works *as such*, it also becomes clear that there is a complimentary project dealing with these, but with a view to their bodily side or to the bodily environment in which they occur. This latter project is carried out in the *Parva Naturalia*. It is defined and announced in *De Sensu* 1 by the formula that there are activities of animals that are common to body and soul, such as "perception, memory, spirit, appetite and, in general, desire, and in addition to these, pleasure and pain" (436^a8–10). Since the *De Anima* has already touched upon some of them, it seems to be presupposed that there is a way of dealing with them that is appropriate for its project, even though it studies the soul as such and does not consider, for example, sense perception as common to body and soul.

This is most probably not intended to say that the *De Anima* is oblivious to the fact that each of the capacities it distinguishes (with the well-known possible exception of the understanding) requires a suitable bodily part and that the soul as a whole requires a suitable body that is potentially alive. Even in this treatise Aristotle refers to perceptual organs and sometimes even to their material constitution (especially because the constitution is important for an organ's receptivity of certain perceptible qualities). It is, however, less interested in other questions that might characterize a study of activities that are common to body and soul, for example, anatomical and physiological details, locations within the body, and extraordinary and pathological phenomena such as fever, the effects of alcohol, melancholy, or bodily conditions due to very young or very old age.

In order to motivate a complementary study of activities that are common to body and soul, it is not enough to study activities of the soul that are manifested in some bodily parts. It requires a stronger sense of "common to body and soul," perhaps one that amounts to saying that these activities are studied insofar as they are common to body and soul. This, again, might mean that one has to deal in detail with bodily processes or the bodily environment as well as with accounts of how psychic phenomena such as dreams, memory, recollection, and so on come about due to a collaboration of body and soul—for example, through appearances, on the one hand, and the way they are stored in specific bodily regions and processed or impaired by phenomena such as rising heat, side effects of digestion, and so forth, on the other. When, for example,

in *On Memory* 2, Aristotle refers to indications that recollection is "something bodily" (453ª14), he is no longer interested in the by now trivial fact that the affections of the soul do not come about without the body. Rather, he is eager to show how the model of coordinated sequences of bodily movements that was presupposed in his account of recollection finds support in certain pathological bodily circumstances that obstruct these sequences. The interest he displays in such questions is typical of the *Parva Naturalia*, while their absence from the *De Anima* is telling with regard to the division of labor within Aristotle's study of the functions of the soul.

Inasmuch as the *De Anima* confines itself to the study of the soul and its capacities as such, it leaves a blank space for the complementary study that aims to enrich the causal explanatory picture by focusing more squarely on the somatic preconditions and material causes involved in various affections and activities of living beings. The treatises in the *Parva Naturalia* (at least, in the first section) exemplify this sort of complementarity quite clearly. Apart from sense perception, memory, and the various types of desire, which in *De Sensu* 1 are referred to as "the most important" activities common to body and soul, Aristotle also mentions the study of waking and sleeping, youth and old age, inhalation and exhalation, life and death, which roughly correspond to the second section of the *Parva Naturalia*, which involve only the nutritive soul, while the functions treated in the first section mostly involve the perceptual soul.

It remains to add that none of the treatises traditionally ascribed to the *Parva Naturalia* deals with certain psychic phenomena that were announced in *De Sensu* 1, namely, "spirit, appetite, and, in general, desire, and in addition to these, pleasure and pain." Yet desire plays a crucial role in Aristotle's account of animal movement or spatial movement. It is through an animal's desire for some object that all animals move themselves. This account is developed at length in *De Motu Animalium*, which discusses it precisely as an activity that is common to body and soul, in that it treats not only the psychic capacities that are involved in animals' self-movement, but also the bodily instrument by which self-propelled spatial movement is accomplished. The natural place for this treatise within the system of Aristotelian works would thus be at the end of the first section of the *Parva Naturalia*, since without it the project announced in *De Sensu* 1 would remain incomplete.

3.5. Transition: The Studies of the Soul and of Animals as Intertwined

The treatment of the soul as a starting-point of living beings invites all sorts of studies that make use of this starting-point in the domain of living beings. In this respect, the *De Anima* might be considered a foundational text for the studies of all living beings, both animals and plants. Indeed, there are passages that present the *De Anima* and the *Parva Naturalia*, on the one hand, and Aristotle's zoological works, on the other, as closely intertwined. At the end of *De Motu Animalium*, which, as we saw, should be attached to the project of the *Parva Naturalia*, Aristotle says:

> As regards the parts of each animal, as regards soul, and further as regards perception, sleep, memory, and the common movement, we have given the causes; it remains to speak about generation. (704^{a}3–704^{b}3)

What he is referring to is, first, the zoological work *On the Parts of Animals*, second, to the *De Anima*, third, to the first section of the *Parva Naturalia* together with *De Motu Animalium*, and finally to the zoological work *On the Generation of Animals*. This is a sequence of works that either belong to the study of the soul and the functions common to body and soul or to the zoological works more narrowly conceived.

What is genuinely unclear, though, is the nature of the sequence stated: Is Aristotle speaking of the chronology of these works, that is, about what he wrote first and what afterward and what still needs to be written? If so, why would that matter to his readers? Or is the sequence rather referring to an envisaged order of study? For example, after dealing with the parts of animals, should one deal with the soul and the functions common to body and soul, and only then with the generation or reproduction of animals? Either way, the intertwining of the study of soul and the zoological works firmly accommodates the study of soul within the study of nature and living beings generally speaking (or, at least, the study of all parts of soul except the understanding, which is said to be a different sort of soul); at the same time it makes clear that, as Aristotle points out in *On the Parts of Animals* 1, the philosopher of nature who wants to inquire into animals, has to consider the soul or, at least, the relevant parts of it (641^{a}18–^{b}10).

3.6. The Zoological Works

As the grand plan shows, Aristotle's philosophy of nature would be incomplete without biology, the study of animals and plants (even though no Aristotelian work on plants has come down to us). And this study is, above all, empirically oriented, but it also draws on the theory of the soul and its functions from the *De Anima* and the *Parva Naturalia*, the four-causes theory from the *Physics*, the hylomorphism of the *Physics* and the *Metaphysics*, and, of course, the scientific methodology as presented in the *Analytics*.

In a famous passage, Aristotle promotes the study of animals (as against those who confine themselves to the study of everlasting and divine beings) by pointing out that we know so much more about animals than we know about remote celestial beings, just because we live among them (*PA* 644^{b}24–29). This empirical foundation of Aristotle's zoology is impressively documented by the longest of all Aristotelian works, *On the History of Animals*, which provides a collection of facts or observations about the parts of animals (that is, their anatomy; roughly *HA* 1–4), their reproduction and the reproductive organs (*HA* 5–7), and their manners of life together with their characters (*HA* 8–9).

The work is said to deal with the differences between animals "in accord with their lives, actions, characters, and parts" (*HA* 487^{a}11–12). In the course of it, Aristotle describes hundreds of species of animals and derives many of his anatomic observations

from dissections of animal bodies. Many details he seems to owe to the reports of experts, such as fishermen, animal breeders, beekeepers, shepherds, herdsmen, sponge divers, bird-catchers, and hunters. He also describes animals that were almost certainly exotic to him—for example, crocodiles, hippopotami, elephants, and camels—thus apparently relying on travel reports. He starts with the examination of human beings (*HA* 491^{a}19–23, *PA* 656^{a}7–10), since human anatomy is more familiar to the human researcher, and thus *On the History of Animals* also includes many details about human anatomy, representing the state of medical craft of Aristotle's time.

Merely saying, though, that *On the History of Animals* is a collection of observations may conceal the fact that it also represents one of the greatest achievements of Aristotle's biology. For in order to organize all the material he presents here, he has to introduce his taxonomy of animals, which already prefigures in many important respects Linnaeus' famous *Animal Kingdom* (*Regnum Animale*). Aristotle distinguishes between blooded and bloodless animals (roughly corresponding to the modern distinction between the vertebrates and invertebrates) and subdivides the former into five "highest kinds" and the latter into four. Among the blooded animals there are birds, fish, cetaceans, the egg-laying four-footed animals, human beings together with live-bearing four-footed animals, while the four kinds of bloodless animals are hard-shelled animals or shellfish, soft-shelled animals (crayfish, crab, lobster, etc.), soft-bodied animals, and insects (see *HA* 490^{b}7–15 with 505^{b}25–32).

The differences and resemblances between different kinds and forms (traditionally, "genera and species") of animals pose a general problem for the organization of zoological research. Is the science of animals supposed to deal with each kind of them separately or should it deal with affections that different forms have in common, since, for example, all animals sleep, breath, grow, decay, and pass away? If zoologists follow the first path, which is suggested by the distinctness of animal species, they would have to say the same things again and again—for example, when discussing sleep in dogs, cats, hedgehogs, rabbits, and so on. This problem is dealt with in *On the Parts of Animals* 1, which serves as a general methodological introduction into the study of animals (in addition to the methodology provided by the *Posterior Analytics* and the discussion of starting-points and causes in the *Physics*, as the study of animals faces peculiar challenges).

Aristotle points out that the parts of two different kinds of animals might differ only in degree or might be different in shape or configuration, while being merely analogous in those respects. For example, the differences between different species of birds are a matter of "the more and the less"—some birds have long feathers, others short ones, while fishes differ from birds by analogy "for what is feather in the one is scale in the other" (*PA* 644^{a}21–22). Differences between animals might thus be more or less significant: they are insignificant when they only concern different sizes or the softness/hardness and smoothness/roughness of their parts. Aristotle therefore suggests that one might treat common affections or parts of different animals together, as long as they have a common nature or else contain closely allied parts or affections. And this

is pretty much what he practices throughout his zoological work. He is happy to discuss the bodily parts, the reproduction, or the characteristic activities of all related animals or animals within one kind together, but he is prepared to give different accounts, whenever the differences exceed the less significant variations mentioned above.

A foundational principle running through Aristotle's zoological work as a whole is that knowledge and understanding have to proceed from knowing *that* (for example, that a thusly shaped organ belongs to animals of a certain kind) to knowing *why* (for example, because this particular kind of animal has a certain essence or nature or because animals of this kind need an organ shaped in this way for this or that purpose). Methodologically speaking, this means that research has to start with the collection of facts and then proceed to the explanations (which, according to the theory of the *Posterior Analytics*, can ultimately be presented as demonstrations): "first one must grasp the things that appear to be so about each kind, then state their causes, and then speak about their coming to be" (*PA* 640^{a}14–15; also *APr.* 46^{a}17–27).

In the case of zoology, the fact-collecting and the explanatory phases of inquiry typically appear in different treatises: The collection of facts about animal parts (organized in accord with the above-mentioned taxonomy and principles) in *On the History of Animals* 1–4 finds its explanatory counterparts in *On the Parts of Animals* 2–4, while the collection of observations about the reproduction of animals in *On the History of Animals* 5–7 corresponds to the explanatory treatise *On the Generation of Animals*. The collection of facts about animal modes of life and character in *On the History of Animals* 8–9, however, is not matched by an explanatory treatise.

In addition to *On the Parts of Animals* there is a short treatise *On the Progression of Animals*, in which Aristotle focuses on the parts of animals that are required for the different sorts of progression, such as walking, swimming, and flying, and discusses why these parts are shaped and arranged as they are. Although the titles of this treatise and of *De Motu Animalium—On the Movement of Animals*—could easily be confused, the two books have quite different agendas. The former is concerned with differently shaped extremities possessed by different kinds of animals and required for different types of progression, while the latter is interested in the common account of animal movement and in self-movement as a function that is common to body and soul.

What does an explanation in the explanatory part of Aristotle's zoology look like? With regard to what Aristotle calls the "parts" of animals (which include their overall external shape, extremities, inner, uniform and non-uniform parts, organs, tissues, body fluids, etc.) the explanation often takes the form of showing how the "part" contributes to one of the life functions, such as perception, breathing, self-nourishing, reproduction, and protection. Starting from the oft-repeated heuristic principle that "nature does nothing pointlessly," Aristotle also tries to explain why particular parts of animals have a certain size, shape, or position within the body. For example, why do animals have the part called the "epiglottis"? In order to protect the windpipe. Why does the windpipe need to be protected? Because it is located in front of the esophagus, so that pieces of food can get into the windpipe. Why, then, is the windpipe in front of

the esophagus? Because it must be connected with lungs, which are located in the front, if it is to enable breathing. Or, to take another example, why are the feet of some birds webbed, while the feet of other birds are unwebbed, but their legs are remarkably long? Because the first kind of birds live in water and need the webbed feet for swimming, while the latter birds, say marsh birds, live in the marsh and need the long legs because of the unstable ground. Therefore, nature has allocated, as it were, the available matter to different parts of the body.

Here is another telling example of so-called final or teleological explanation in *On the Parts of Animals*. Why is it that all living human beings have an upright posture? Explanation: by their nature humans have the capacity to think. Even though thinking has no proper organ (as Aristotle thinks), thinking makes use of the so-called common perceptual capacity, which is located in the region close to the heart. Excessive weight pressing on the region close to the heart impairs the capacity's activity. In animals, such as four-footed ones, whose body is horizontally oriented, much weight presses upon the heart. Human beings' thought, however, requires a body in which it is not the case that much weight presses upon the heart, hence they have an upright posture.

Once this explanation has been established, Aristotle can rely on the erect posture of human beings in further explanations of additional features of the human body. Why do human beings have fleshy buttocks and thighs? Because the weight in the lower region of the body makes it easier for them to maintain an upright posture. Why do they have arms and hands? Because, due to their upright posture, they do not need front legs, so that nature could assign a different function and shape to their upper extremities.

In his presumably final work on zoology, *On the Generation of Animals*, Aristotle discusses the reproduction of animals (both sexual and what he considers "spontaneous" generation), the development of the embryo until birth, and to some extent, the development of the animal after birth. This treatise includes numerous observations (building on what he already mentioned in *On the History of Animals* 5–7), but it is particularly noteworthy how much this work is embedded into Aristotle's *Metaphysics*. In the latter work, Aristotle connects his theory of perishable substance with assumptions about animal generation, and *On the Generation of Animals* appears to be where he substantiates these claims.

At the beginning of *On the Generation of Animals* 1 (715^{a}11–14), Aristotle emphasizes the importance of the moving cause, suggesting that investigating this cause is almost the same as investigating the generation of animals. This should be understood in the context of *On the Parts of Animals*, where he explains the particular parts of animals with a view to their essence and purpose. Having established these points, he then explores how the various parts come into being, one by one. In sexual reproduction, this process involves animals with differentiated sexes. The male is identified as the moving cause of an offspring that belongs to the same form. His semen acts on the material provided by the mother (the menses) through inherent movement, seemingly transmitting

the substantial form belonging to the parents' shared form. Meanwhile, the body of the male's semen evaporates and does not become part of the embryo.

The information required for the heredity of individual characteristics is also stored in the mother's menses. According to one interpretation, this can be seen as a sort of two-semen theory, with two functionally differentiated seminal products. But Aristotle strongly disagrees with theories that attribute the same function to male and female semen, relying on the functional differentiation of form and matter. He also objects to pangenesis theories, which suggest that semen includes small-scale models of all parts of the parents' bodies. Instead, the father's semen initiates the generation of one primary organ, the heart, which then begins to control the subsequent process of generating other parts in a sequence Aristotle considers necessary. This sequence is determined by the particular organs' contributions to the functions of the nutritive and later the sensitive soul.

3.7. Theoretical Wisdom or Primary Philosophy

Aristotle's *Metaphysics* is one of the most influential works of ancient philosophy. It has shaped the concept and philosophical discipline of metaphysics from antiquity down to the present and its "theological" part has been adopted, in one way or another, by theologians of all Abrahamic religions. Aristotle thought that what he was doing in his *Metaphysics* is the supreme part and ultimate goal of all philosophy. And although there was no established term for this philosophical discipline prior to this work, Aristotle goes out of his way to show that all previous philosophers ultimately attempted to give answers to the question that his *Metaphysics* is meant to answer, namely, the question: What are the primary starting-points and causes of everything? At the beginning of the work Aristotle announces the project under the traditional term of *sophia* ("theoretical wisdom"), since we expect the wise person to know, as it were, everything, especially the most difficult things, things that admit of the most precise knowledge, and things people want to know for their own sake and not for any other purpose.

A bit later, when he tries to sketch a proper science that deals with these subjects, he speaks of the science "we are seeking" ($982^{a}4$), thus indicating the groundbreaking character of his project. Later on, he keeps speaking of "primary philosophy," which is also the formula he uses when he adds cross-references to the *Metaphysics* in other works. The term *meta ta phusika*, as we saw, is not used in the extant works by Aristotle and is thus probably the invention of ancient editors. It may refer to the place of the *Metaphysics* in the edition of the Aristotelian oeuvre or it may refer to an intended ideal order of study, in which the subject of the *Metaphysics* should be approached only after completing the study of nature.

That Aristotle sees the project of the *Metaphysics* in continuity with what previous philosophers were after does not mean, to be sure, that he settles for any of the previous theories. On the contrary, major parts of the *Metaphysics* are dedicated to a criticism of his predecessors and competitors (which makes it, as should be noted in passing,

an invaluable source for doxography, the collection of philosophical doctrines). He usually presents himself as opposing two different camps. One of these comprises the philosophers of nature who took the starting-points of nature to be the starting-points of all reality. Some of them did not even correctly identify the starting-points of the changeable world, because they seemed content to make use of one type of cause alone. At any rate, none of them had a proper understanding of formal (linked up with the definitional method that Aristotle accepts from the Socratic-Platonic tradition) and final causes.

On the other side are the Pythagoreans and Plato and the members of his Academy, who do have a grasp of forms and formal causes but, to put it in a nutshell, became fixated on numbers, separated eternal Forms (or a combination of both), and accounts of primary starting-points that are modeled after such entities (most of Books 13 and 14 are dedicated to the refutation of this latter sort of theory). On the whole, Aristotle thinks that these more abstract or metaphysically demanding approaches cannot adequately serve as starting-points and causes for physical substances. In fact, his approach is in one way closer to that of the first camp: he imports into the *Metaphysics* his theory of the four causes from the *Physics* and draws heavily on the paired notions of matter and form, which are first derived in the analysis of the starting-points of change and generation of natural beings. If there were no substances beyond the natural ones, the philosophers of nature would be right, and physics would turn into primary philosophy (*Met.* 1026^{a}27–32). Aristotle insists, however, the changeable world is not everything there is and, hence, the search for the truly primary starting-points must go on.

The *Metaphysics*, as it has come down to us, comprises fourteen books. All of them are clearly related to the core project of what Aristotle takes to be primary philosophy, but there have always been worries about the coherence and unity of the work and about whether its composition reflects decisions made by the early ancient editors (see Section 2). Apart from the fact that the different books included in the *Metaphysics* seem to approach the task of identifying the primary starting-points and causes from quite different angles, there are some manifest editorial problems:

- Book 11 consists solely of excerpts from the *Physics* and from Books 3, 4, and 5 of the *Metaphysics* itself.
- Books 1 and 2 present two competing introductions. And even though Book 1 includes the more substantial and more pertinent introduction, the Arabic commentators on Aristotle who only knew parts of it were able to make good sense of the *Metaphysics* as a whole, relying on the assumption that Book 2 represents the true introduction to this work.
- Parts of Book 1 are repeated in Book 13.
- Book 12, which one might expect to contain the work's main answer to the question posed, does not seem to be well-connected with certain other books; for example, it does not seem to include any back- or forward-references, and in its first half (12.1–5) it deals with perceptible substances, which have also been the subject of Books 7 and 8.

- Many scholars are also worried about Book 5, which presents a sort of lexicon of thirty key terms which are "said in many ways." All these terms are somehow pertinent (some more than others), but why do we need such a lexicon at all and why at this particular place?

Owing to these and related problems, some scholars have opposed any attempt to read the *Metaphysics* in its transmitted form as a coherent work and focused instead on particular books or particular groups of books, such as Books 7–9, which some regard as a more or less self-contained project about perceptible substance.

On the other hand, there are also indications of an intended coherence of the work. For example, Book 3 presents fifteen puzzles that the outlined science of primary starting-points and causes has to face. And throughout the *Metaphysics* one can find back-references to these initial puzzles as well as apparent solutions to them, sometimes explicitly presented as such. Also, early on in the *Metaphysics* Aristotle states that "something is said to *be* in many ways." In several books we find back-references to this statement, and in two or three instances the list of different meanings of "being" is even used as a sort of guideline for what has to be accomplished within this work.

Another common thread is the notion of substance. Some beings are said to be beings because they are substances, others are said to be beings because they are dependent on or suitably related to substances. References to substances can be found throughout the *Metaphysics*, and Books 7, 8, and 12 are explicitly dedicated to the treatment of substances. Given that the notion of substance captures in one way or the other the idea of ontological priority or independence, they seem to be quite pertinent to the project of the *Metaphysics* for, whatever the primary starting-points and causes look like, it is hard to think of them as dependent beings (for then they would depend on other, independent starting-points with a better claim to being primary starting-points and causes).

How the loose ends of the different books of the *Metaphysics* should be tied together is one of the most controversial questions in Aristotle scholarship. Here are some of the signposts that interpreters of the *Metaphysics* have to deal with. After Book 1 formulates the goal of finding the primary starting-points and causes and makes clear that these starting-points must be sought in terms of the four types of causes known from the *Physics*, and after the puzzles of Book 3 provide a sort of checklist of problems to be solved by the new, sought-after science, Book 4 makes a fresh start by saying that this new science will be an inquiry into "being qua being," a concept that plays an important role also in Book 6's specification of various theoretical disciplines and various broad inquiries within primary philosophy, most notably, the division of being according to the categories.

Scholars have sometimes thought that Aristotle thereby leaves behind the project of searching for the primary starting-points and causes. However, already in 4.1 he makes clear that the new science should seek the starting-points and causes not of being qua changeable or anything like that, but of being qua being: "That is why it is of being qua being that we must grasp the primary causes" (1003^a31–32). In 4.2 Aristotle

immediately appeals to the many ways in which things are said to *be*, a phenomenon that, in principle, could jeopardize the unity of an inquiry into being qua being. He makes clear, however, that the various ways are unified in that they are all related to one single type of thing, which is substance. He also outlines how an inquiry into being should deal with the affections of being (for example, one or sameness) and their contraries (for example, distinctness).

From 4.3 on, the discussion turns to certain axioms that are said to be most stable and to hold true of all beings, such as the principle of non-contradiction. These axioms, it turns out, are indeed starting-points that primary philosophy must deal with (which seems to be a first result), but they are starting-points of proof (only), not of substance, which leaves it to the later part of the study to identify primary starting-points that are starting-points of substance.

It is Book 6 that finally introduces the notion of primary philosophy by opposing it to other parts of theoretical philosophy. Primary philosophy is said to deal with unmoved and separable things, and in this context it is also equated to theology, the science of divine beings. This move has puzzled scholars because it is no longer clear whether the project carried out in the *Metaphysics* is meant to be about all beings (a universal science of being qua being), or about a certain elevated region of being, the separate, unmoved (and divine?) being. Or can both aspects be reconciled by assuming that the science is about separate, unmoved beings that are (among) the primary starting-points and causes of all beings, so that the study of these beings would be universal by being primary (1026^{a}30–31), that is, by being concerned with the starting-points of everything?

In light of the prominence of substance within a study of being qua being and also in light of the claim that everything else is dependent on substance, it is no surprise that Aristotle dedicates a detailed discussion to substance. Books 7 and 8 give important insights into the notion of substance in general, but are primarily concerned with material, changeable, perishable substances. Substances are the substrates or bearers of non-substantial affections; in the case of material substances matter is also a sort of substrate in that it underlies the determinacy that defines what each thing is. Relatedly, Books 7 and 8 give pride of place to what Aristotle calls *to ti ên einai*, the essence of a thing. It is this essence that makes each particular thing the kind of thing it is. In this sense, essence is said to be the "cause of being" of each thing. Aristotle argues that for material, perceptible substances, a thing's form is its essence. Therefore forms, as essences, are causes and starting-points of material substance (which, again, is a positive result).

However, they are not starting-points and causes of everything, but only of perceptible substances, and they only occur in the suitable sort of matter. Matter and form relate to each other as potentiality to actuality: the matter of a house is this house-in-potentiality, while it is the form (imposed by an architect, that is, an efficient cause) that turns the potential house into an actual one. Thus, the conceptual pair of potentiality and actuality becomes more and more important in the discussion of substance, which

might be the reason why Book 9.1–9 is entirely dedicated to being-in-potentiality and being-in-actuality (and includes a remarkable series of arguments for the priority of being-in-actuality).

In the end all eyes are focused on Book 12, which is supposed not only to come up with the highest starting-points, but also to tie together the loose ends of the previous discussions. Since it fails, to some extent, to meet the second expectation, scholars have wondered whether it really contains the discussion that Aristotle has announced throughout the *Metaphysics* or whether it is an independently drafted treatise used to provide, for example, a discussion of immaterial substance, otherwise notably absent from the *Metaphysics*. However that may be, it clearly distinguishes, first, perceptible and perishable substance, second, perceptible and imperishable substance (like the celestial bodies that Aristotle takes to be everlasting), and, third, non-perceptible and imperishable substance. The latter exists without matter and, hence, in pure actuality; in fact, Aristotle argues that such a purely actual substance must exist in order to guarantee the eternal, uninterrupted movement of the world as a whole. It therefore serves as an immovable mover, the existence of which has also been proved in *Physics* 8.

"This, therefore, is the sort of starting-point on which the heaven and nature depend" (*Met.* 1072^{b}13–14), Aristotle writes, and this seems to be his way of saying that this is (one of) the primary starting-point(s) he was looking for. It moves the world in the way that objects of desire or love move something else, that is, without itself being moved. In this way the immovable mover moves the outermost celestial sphere (eternally moving in a circle), while this outermost sphere or "primary heaven" is responsible for moving the adjacent celestial spheres. For Aristotle, such an immaterial substance, one that by its essence is actual being, can only be thought of as an everlasting understanding, which is divine and spends the best, most joyful life by thinking without interruption (this is probably why theorizing about this substance might also be described as "theological").

Aristotle also assumes a kinship between this divine understanding and the one found in the human soul that does not have a bodily organ (as Aristotle notoriously assumes). Human understanding can thus be seen as a divine element in human beings. However, while divine understanding, the immovable mover, never tires of thinking of itself, we human beings, being corporeal and anchored in social communities, can activate our thinking (and thereby enjoy the sublime pleasure of intellectual activity) only for a short period of time. This is also part of the reason why Aristotle holds the theoretical activity and, in particular, the part of philosophy that contemplates the primary starting-points, in such high esteem.

3.8. The Science of Human Affairs: Ethics and Politics

Aristotle's subdivision of sciences relies crucially on the distinction between things whose starting-points cannot be otherwise (not in the sense that these things cannot undergo change, but in the sense that they are subject to by-necessity-statements) and subjects that typically can be otherwise. With regard to the former subjects, we can

contemplate or understand them, while the latter things can be altered, attained, or produced by human agents and craftsmen (see *EE* 1214^{a}8–14). It is this latter group of things with which the practical and productive parts of Aristotle's philosophy are concerned. In *Nicomachean Ethics* 6 he even maps this distinction onto the architecture of the rational, reason-possessing part of the soul, insisting that there are two parts of it corresponding to subjects that can be otherwise and those that cannot (1139^{a}6–12). Whether one deals with subjects of the former or subjects of the latter type makes all the difference regarding the exactness and status of statements we can make about them.

The distinctively practical science, which comprises ethics and political philosophy, is more narrowly defined by its occupation with human action. Though Aristotle sometimes refers to both the moral and political fields taken together as the "philosophy of human affairs" (*NE* 1181^{b}15), he more frequently subsumes them under the heading of "politics," which is misleading for the modern reader, as it not only comprises Aristotle's political philosophy, but also what we call "ethics" or "moral philosophy." Aristotle's moral philosophy (as developed in the *Eudemian* and *Nicomachean Ethics*) is one part of what he calls "politics," the other part being his political philosophy in the narrow sense (as presented in his *Politics*), which deals with the nature of the city or *polis*, the citizen, and, above all, the comparison of political constitutions.

For Aristotle, indeed, the adjective "political" just means that something or someone is related to the *polis*, so that the difference between moral philosophy on the one hand and political philosophy on the other seems to boil down to the difference between treating human happiness and its attainment from the perspective of individuals and treating it from the perspective of the entire *polis* (*NE* 1094^{a}26–^{b}10), that is, with a view to political conditions that either facilitate or impede the individual attainment of happiness.

Aristotle assumes that a city supports its citizens' quest for happiness by good legislation, above all. This is because human beings acquire their stable traits of character in accord with how they act—good character traits from good actions and bad traits from bad actions—and because good laws have an important role to play in making people act well. This is why Aristotle in the *Eudemian* and *Nicomachean Ethics* keeps addressing or referring to prospective legislators, for whom he takes his discussion of moral philosophical questions to be most pertinent, because it is they in particular who will be responsible for the legislation that helps people achieve happiness.

There is the notorious problem, as we saw, of why there are these two treatises and why the three common books (*EE* 4–6 = *NE* 5–7) have been transmitted as parts of both of them. By and large, the agenda of both treatises is similar: apart from the common books, each includes a discussion of the supreme good and happiness, the definition of virtue of character, particular virtues of character, pleasure (in *EE* 6, *NE* 7 + 10.1–5), and friendship (*EE* 7, *NE* 8–9). Still, there are also not insignificant philosophical differences between them—for example, *EE* 8.3 identifies the contemplation of god as the supreme end of human life, while *NE* 10.7–8 speaks of the contemplative

life more generally and also acknowledges the life in the city as appropriate for human beings.

What, then, is the relation between these two—to some extent competing—works on ethics? Can one of them be regarded as superseding the other—for example, one being an early attempt, the other being better considered, or one representing the original insight, the other being more mature and less uncompromising? Many scholars lean toward thinking that the *Eudemian Ethics* is the earlier work, but no general consensus has been reached, in particular about the common books. One problem that commentators must confront in answering these questions is that, in terms of reception, the *Nicomachean Ethics* has surpassed the other to such a great extent that it is difficult not to read the *Eudemian Ethics* through its lens.

Apart from the co-existence of two ethical works, the crucial question for the unity of the practical division of Aristotle's philosophy concerns the role of the *Politics*. As already mentioned, Aristotle seems to say that the former treatises deal with individual attainment of happiness, while the latter deals with collective happiness in the city and the legal-constitutional conditions that facilitate its acquisition. And the *Politics* has a lot to say, indeed, about the comparative value of different constitutions, the search for the best constitution, and the virtues of citizens—topics that suggest a kinship between political philosophy and ethics. At the same time, the agenda of the *Politics* goes clearly beyond this narrow ethical, virtue-related agenda, in that Aristotle is also interested in non-ideal states and constitutions, namely, real cities that, due to incidental conditions such as poverty, civil unrest, the character of the inhabitants, and so on, do not match up to the ideal of educating their citizens in virtue and are not governed by virtuous leaders. In particular, the so-called empirical books (4–6) deal with a wide range of real constitutions which can do better or worse—for example, with regard to political stability, the avoidance of political coups, and the integration of different social groups. All these factors, Aristotle assumes, can make a difference to life in these cities, even though they need not directly pertain to the virtues of the citizenry.

Methodologically speaking, Aristotle continually emphasizes that the epistemic status of moral philosophy, broadly conceived, is quite distinctive. While in strictly theoretical philosophy and science an Aristotelian philosopher often aims at demonstrating that if a certain individual object belongs to a certain universal kind, it must have certain intrinsic coincidents by necessity, it would be inappropriate to expect such results in the domain of moral philosophy. For even if it is highly plausible to say that certain things (for example—health, wealth, beauty, good fortune) are good and beneficial for most people, the moral philosopher is not in a position to deduce that they are good and beneficial for everyone, since in some, perhaps only a few, cases, those things commonly held to be good may turn out to be harmful. Aristotle draws the unambiguous conclusion that one cannot expect ethical statements to have the same exactness as, for example, mathematical ones. In ethics, he says, one deals with what happens "for the most part" and must be content to give an "outline" of what it means to have a happy life, and so on. The clear message is that approaching moral philosophy

with the standards of strictly theoretical philosophy or science in mind would inevitably lead to mistakes.

This seems reasonable, as it stands. But what are the alternatives? Yielding the floor to those who make ethics a matter of mere conventions and subjective preferences? Clearly, this cannot be Aristotle's point of view, for it is the core project of his moral philosophy to derive, at least, a general outline of forms of life that are suitable for attaining happiness. Obviously, these questions have been taken up in exciting philosophical and exegetical debates, which may have consequences not only for the understanding of Aristotle, but also for the way one thinks of moral philosophizing quite generally. Since Aristotle seems to be saying that ethics is not like an ordinary science, not allowing of scientific demonstrations, some scholars have suggested that what he is doing in his ethico-political treatises is more like dialectic, perhaps drawing on, and refining, what people think about happiness. Others have tied these remarks about precision to Aristotle's intellectual virtue of practical wisdom, which they understand as an experience-based ability to make good decisions in particular affairs with a view to what matters for life as a whole, but cannot be codified as a full-fledged Aristotelian science. Still others have argued that Aristotle did not intend by his remarks about the status of ethical questions to dismiss the scientific model of the theoretical sciences (sketched in the *Posterior Analytics*) entirely, but only to ensure more flexibility vis-à-vis the perhaps overly strict demands of theoretical inquiry. On this reading the study of human agency and human happiness would use some of the same methods that Aristotle uses elsewhere (for example, the method of defining the core concepts, of dealing with puzzles, identifying certain starting-points, etc.) without attempting, though, to give demonstrations of what is good or bad in a particular case (which is a matter for practical wisdom, not science).

3.9. From Ethics to Moral Psychology

In broad outline, it is clear that, according to Aristotle, the happy life for human beings flows from and consists in steady or repeated activities in accord with the virtues or excellences of the parts of the soul that are peculiar to human beings—these are, first, the part that possesses reason (the excellences of which are the so-called virtues of thought, such as practical wisdom and theoretical wisdom) and, second, the part that is not itself rational but is able to obey to reason (the excellences of which are the so-called virtues of character).

Most of the particular virtues that Aristotle lists, for example, courage, temperance, justice, and generosity, are clearly acknowledged by Greek popular morality of his time. But his ambition is to show that they can actually be seen as genuine virtues of the human soul, that is, as the best states of those parts of the soul that, according to human nature, are peculiar to human beings and thus contribute to their well-being and happiness. The non-rational part of the human soul is in its best state when people are disposed by their character traits to do the right things, to have the appropriate feelings,

and to take pleasure in doing the right things or to do them easily. This is important to emphasize because it demonstrates to what extent Aristotle's ethics is entangled with his moral psychology.

Aristotle's deep and profound interest in questions of moral psychology—questions concerning feelings, desires, the experience of pleasure and pain, deliberation, decision making, character traits, and habituation—is a common thread that can be found in many Aristotelian treatises, even though there is not one single treatise that is dedicated to it. True, the ethical treatises themselves have a lot to say about moral psychology, especially when it comes to character virtues, decision making, and habituation, but additional pieces of Aristotle's moral psychology must be gathered from different projects. The *Poetics* and the *Rhetoric*, in particular, deal quite extensively with questions of character and feelings. *Rhetoric* 2.2–11 is the most elaborate discussion of different types of human feelings available at the time. In the two last books of *On the History of Animals*, Aristotle speaks of character traits and feelings that one finds in non-human animals. The *De Anima* famously uses feelings as paradigm cases for psycho-somatic affections, for one cannot have a feeling without also undergoing somatic alternations. Likewise, *De Motu* accounts for both the psychological and the somatic conditions that, taken together, are sufficient for the self-motion of animals.

3.10. The Two Remaining Projects: Rhetoric and Poetics

The *Rhetoric* and the *Poetics*, both major and extensively received works, do not seem to easily fit into Aristotle's research program of either theoretical or practical philosophy. The widespread puzzlement about their place within his system and oeuvre is indicated, for example, by the fact that they were not even included in the first printed edition of his works and that the medieval Aristotle commentators in the Islamic world ended up assigning them to the *Organon*. Even though both works have a significant terminological overlap with Aristotle's moral and political philosophy, especially with its moral psychological part (dealing with feelings and character), they are not part of the same project. Both deal with phenomena that are deeply rooted in the Athenian cultural life of Aristotle's time, namely, epic poetry and theater (the *Poetics*) and oratory (the *Rhetoric*). While these phenomena might be thought to have a harmful impact on the public (as Plato forcefully argued), Aristotle shows that neither of them needs to be considered pernicious, as long as they are understood and conducted in an appropriate way. The feelings elicited by tragedy, for example, far from spoiling the spectators, may even have an innocent purgative or relieving effect. Speeches composed in accord with Aristotle's rhetorical craft may enhance a jury's or assembly's judgment rather than corrupt or distract them. Still, neither the *Poetics* nor the *Rhetoric* directly contributes to the attainment of virtue in the way that the ethical and political treatises do.

The most common solution, therefore, is to couple the *Rhetoric* and the *Poetics* as the two representatives of productive, rather than practical or action-focused, crafts or sciences. But what sort of products exactly are these two works aiming at? The *Poetics*

analyzes the ingredients of good tragedies and good epic poetry. There is no doubt that a poet could benefit from reading it. Does this mean that the *Poetics* has tragedies and epic poems as its defining products in the way that medicine has health as its product? Similarly, the *Rhetoric* deals with what is potentially persuasive (in public speeches). There is no doubt that an orator could benefit from reading this work. Does this mean that speeches are the product of the craft of rhetoric just as shoes are the product of the craft of shoemaking? Or perhaps is it rather persuasion on the hearer's side that is the product at which the craft of rhetoric ultimately aims? Since tragedy is partly defined by the emotional effect on the spectator, should one argue, along the same lines, that this peculiar effect (purgation of tragic feelings) is the ultimate product of the craft of tragic poetry?

What seems to be unfortunate about the label of "productive" sciences or "crafts" is the impression that the respective works would directly instruct the readers in how to bring about the product in question, but this is not exactly what we find in these two works. If Aristotle's *Rhetoric* is meant to help to arrange or to deliver better speeches, it is rather by providing a better understanding of the factors contributing to persuasiveness. Accordingly, the best rhetorician is not the one who manages to convince each and every audience, but the one who is able to see the persuasive potential in any given case. Similarly, if the *Poetics* is meant to contribute to the composition of tragedies it is not by providing guidelines for poets (as in a creative writing class), but rather by getting clear about what is essential and what is rather incidental to a tragedy. For example, every tragedy consists, according to Aristotle's analysis, of six aspects: plot, character, style of speech, thought, spectacle, and melody-composition. If a tragedy is meant to bring about the tragic feelings of pity and fear together with the purgation of such feelings (which is either a pleasant relief from these rather unpleasant feelings or, as some say, a sort of purification of them), it turns out that the one aspect many people care about most, namely, spectacle, is the least important, while the plot alone should be sufficient to bring about the mentioned effect. And in order to construct the right plot, one has to understand the nature of tragic feelings and what sorts of people and actions are likely to bring them about. This is the sort of knowledge that the *Poetics* actually provides. It thus focuses on understanding the very nature of each poetic genre it deals with, and by conveying this understanding it may contribute to the production of better tragedies.

Apart from the special status that these two treatises seem to have by presenting supposedly productive crafts or methods, the *Rhetoric* and the *Poetics* are conceptionally well-connected both with each other and with the rest of the oeuvre. The core theorem of the *Rhetoric*, to begin with, says that there are mainly three factors that bring about persuasion and that can be provided by the rhetorical craft itself: rhetorical arguments, the character of the audience, and the credibility of the speaker. As for the arguments, Aristotle refers to dialectic (as the arguments of public speech have to start with premises that are accepted by the audience), while for the arousal of feelings and the presentation of character he refers to moral philosophy and its already highlighted

expertise in moral-psychological questions. The craft of rhetoric is hence an offshoot of dialectic and political science, insofar as it deals with character.

In the final book of the *Rhetoric* Aristotle turns to a slightly different aspect of the method of persuasion, namely, by looking into the style of speech we use, insofar as it makes a difference for persuasion and understanding. Style of speech again is a topic that the *Poetics* has dealt with at some length in Chapters 19–22, and this is why in the *Rhetoric* Aristotle explicitly refers to the *Poetics*' discussion of this theme. The *Poetics*' account of style again has to deploy a categorization of types of words, a distinction between simple words and sentences, and so on. This touches upon fundamental questions of Aristotle's philosophy of language, as it has been discussed in the *Organon,* above all in the first chapters of *De Interpretatione*.

CATEGORIES*

1
Homonymy, Synonymy, and Paronymy

Things are said to be homonymous when they have only the name in common but the account[1] that corresponds to the name is distinct—for example, both a human and a drawing are animals;[2] for only the name of these is common to them both, whereas the account that corresponds to the name is distinct; for if one specifies what it is for each of them to be an animal, one will give a special account to each. **1ª1** 5

Things are said to be synonymous when they have both a name in common and the account that corresponds to the name is the same—for example, both a human and an ox are animals; for each of them is called by the same name, "animal," and, moreover, the account is the same; for if one gives an account of what it is for each of these to be what it is, an animal, one will give the same account. 10

Things are said to be paronymous in case one gets its name from the other with some difference depending on derivation—for example, the grammarian gets his name from grammar, the courageous person from courage. 15

2
Said-of-a-Subject versus in-a-Subject

Among things that are said, some are said in combination, some without combination. Examples of things said in combination are "a human runs," "a human wins." Examples of things said without combination are "human," "ox," "runs," "wins."

Among the things that there are: Some are said of a subject but are not *in* any subject—for example, human is said of a subject, a particular human, but is not in any subject. Some are in a subject but are not said of any subject. (I call "in a subject" what is in something, not as a part, and cannot exist separately from what it is in.) For example, a particular bit of grammatical knowledge is in a subject, the soul, but it is not said of any subject; and a particular white is in a subject, the body, for all 20 25

* Translated by S. Marc Cohen. Text: L. Minio-Paluello, *Categoriae et Liber De Interpretatione* (Oxford, 1956). The title is a transliteration of the Greek title, *Katêgoriai*. In a legal context this word means "accusations" or "charges"; as Aristotle uses it, however, it means "predicates." The *Categories*, then, is a study of predication, i.e., saying something *of* something, as when one says of an animal that it is a horse, or of a particular horse that it is white.

1. Secluding τῆς οὐσίας ("of the substance") here and subsequently in this chapter.

2. The word *zô[i]on* can mean either an animal or a figure in a picture; the latter need not be the figure of an animal.

colors are in body, but it is not said of any subject. Some are both said of a subject
1b1 and are in a subject—for example, knowledge is in a subject, the soul, and is said of a subject, grammar. Some are neither in a subject nor said of a subject—for example,
5 a particular human or a particular horse. Nothing of this sort is either in a subject or said of a subject.

Unconditionally, things that are individual and one in number are not said of any subject, but nothing prevents some of them from being in a subject. A particular bit of grammatical knowledge is among the things in a subject.

3
Said-of-a-Subject

10 Whenever one thing is predicated of another as of a subject,[3] everything said of what is predicated will also be said of the subject—for example, human is predicated of the particular human, and animal is predicated of human; therefore, animal will also be predicated of
15 the particular human; for the particular human is both a human and an animal.

Differences between kinds that are distinct[4] and not subordinate to each other are also distinct in form—for example, differences in animal and in knowledge. For the differences in animal are, for instance, terrestrial, flying, aquatic, and two-footed, but none of these is a difference in knowledge—one sort of knowledge does not differ
20 from another by being two-footed. Yet if one kind is subordinate to another, nothing prevents their differences from being the same; for the higher kinds are predicated of those beneath them, so that all differences in what is predicated will be differences in the subject as well.

4
The Ten Categories

25 Each of the things said without any combination signifies either a substance, or how much [quantity], or of what sort [quality], or related to what [relative], or where, or when, or being arranged, or having on, or doing, or being affected. To give a general indication of what these things are, here are some examples:

Substance	human, horse
Quantity	two cubits, three cubits
Quality	white, grammatical

3. "Predicated of another as of a subject" seems to be equivalent to the semi-technical term "said of a subject" introduced at 1a20. Thus the import of this paragraph seems to be that the "said of" relation is transitive.

4. Reading ἑτέρων γενῶν.

Relative	double, half, larger	
Where	in the Lyceum, in the marketplace	**2^a1**
When	yesterday, last year	
Being arranged	lying, sitting	
Having on	wearing shoes, having armor on	
Doing	cutting, burning	
Being affected	being cut, being burned	

None of the things mentioned above, said just by itself, constitutes an affirmation, but by a combination with others of these an affirmation is produced; for it seems that every affirmation is either true or false; but none of the things said without combination—such as "human," "white," "runs," "wins"—is either true or false.[5]

5
Substance

Substance in the strictest sense, that which is primarily and most of all called "substance," is what is neither said of any subject, nor is it in any subject—for example, a particular human or a particular horse. What are called "secondary substances" are the forms that the things primarily called "substances" are instances of, both these forms themselves and the kinds of these forms—for example, the particular human is an instance of the form human, and the kind of the form is animal. So these things—for example, human and animal—are called "secondary substances."

It is evident from what has been said that both the name and the account of a thing *said of a subject* must be predicable of the subject. For example, human is said of a subject, the particular human, and so the name is predicated—for you will be predicating human of the particular human; and also the account of human will be predicated of the particular human; for the particular human is also a human. Thus, both the name and the account will be predicated of the subject.

But as regards the things that are *in* a subject, in most cases, neither the name nor the account is predicated of the subject. In some cases, however, nothing prevents the name from being predicated of the subject, but for the account it is impossible;[6] for example, white, which is in a subject, the body, is predicated of the subject—for the body is said to be white—but the account of white will never be predicated of the body.

5. *Int.* 17^a9–12 adds an important qualification.

6. Typically, it is the name of a *paronym* of what is in a subject that is predicated of the subject (1^a12–15). It is "courageous," not "courage," that is predicated of Socrates. But sometimes, the name of what is in a subject will be identical to the name of its paronym, as "white" is both the name of a color and the adjective that is predicated of what has that color in it (*Met.* 1031^b23).

All other things either are said of primary substances as of subjects or are in them as subjects. This is evident from a consideration of particular cases—for example, animal is predicated of human, and therefore of the particular human (for if it were predicated of no particular human, it would not be predicated of human at all). **2^b1** Again, color is in a body, and therefore in a particular body (for if it were not in any particular body, it would not be in a body at all). Thus, all other things either are said of primary substances as of subjects or are in them as subjects. So if there were no primary substances, it would be impossible for anything else to be.

Among secondary substances, the form is more of a substance than the kind; for it is closer to the primary substance. If one were to specify for a primary substance what it is, it would be more informative and more appropriate to specify it by giving the form than the kind—for example, in the case of a particular human, it would be more informative to give human rather than animal; for the former is more special to the particular human, while the latter is more common. And in the case of specifying a particular tree, it is more informative to specify it by giving tree than by giving plant. Further, primary substances are subjects for all other things, and therefore all other things are predicated of them or are in them, and it is for this reason that they are called "substances" most of all. But as primary substances are in relation to other things, so form is in relation to kind; for a form is a subject for its kind. And while kinds are predicated of their forms, the converse does not hold—that is, forms are not predicated of their kinds. So on the basis of these considerations too, the form is more of a substance than is the kind.

Among forms that are not themselves kinds,[7] none is more of a substance than another; for it is no more appropriate to give human in the case of a particular human than it is to give horse in the case of a particular horse. Similarly, among primary substances none is more of a substance than another; for a particular human is no more of a substance than is a particular ox.

It is reasonable that, after primary substances, forms and kinds alone among everything else should be called "secondary substances"; for they alone among things predicated make clear the primary substance. If we were to give [an account of] what a particular human is, we should properly specify it by giving the form or the kind—although we should do this more informatively by giving human than by giving animal. But to give any of the other things one would be to give something alien to it—for example, to give white or runs or anything whatsoever like that. So it is reasonable that of the other things only these are called "substances."

Further, it is because they are subjects for everything else that primary substances are in the strictest sense called "substances." But as primary substances are in relation **3^a1** to everything else, so the forms and the kinds of primary substances are in relation to all the rest; for all the rest are predicated of these. Thus, if one calls a particular

7. I.e., the so-called *infimae species*, or lowest-level forms, are divisible directly into their particular instances but not into lower-level sub-forms.

human "grammatical," it is both a human and an animal that one will be calling "grammatical"—and likewise for the rest.

Not being *in* a subject is something common to all substances. For a primary substance is neither said of a subject nor is it in a subject. And it is also quite clear that secondary substances are not in a subject either; for human is said of a subject, the particular human, but it is not in a subject; for human is not *in* the particular human. In similar fashion, animal is also said of a subject, the particular human; but animal is not in the particular human.

Further, as it regards a thing that is in a subject, although nothing prevents its name from sometimes being predicated of the subject, the account of such a thing cannot be predicated of it.[8] In the case of secondary substances, however, the account as well as the name can be predicated of the subject; for one will predicate of the particular human both the account of human and the account of animal. So no substance[9] is among the things in a subject.

This, however, is not special to substance; differences are not in a subject either; for terrestrial and two-footed are said of a subject, a human, but they are not in a subject; for neither two-footed nor terrestrial is in a human. Moreover, the account of a difference is predicated of what the difference would be said of—for example, if terrestrial is said of a human, the account of terrestrial will also be predicated of a human; for humans are terrestrial.

We should not be afraid that we might have to say that the parts of a substance are not themselves substances on the grounds that they are in a whole as in a subject; for it was said that the "things *in* a subject" are not like a part being in something.[10]

One characteristic of substances and differences is that everything called from them is so called synonymously; for every such predicate coming from them is predicated either of individuals or of forms. (While a primary substance yields no predicate—for a primary substance is not said of any subject—among secondary substances the form is predicated of the individual, and the kind is predicated of both the form and the individual. Similarly, differences are predicated of both forms and individuals.) Moreover, primary substances admit of the account both of their forms and of their kinds, and a form admits that of its kind. (For whatever is said of what is predicated will also be said of the subject.) Similarly, both forms and individuals admit of the account of their differences. But we saw[11] that synonymous things are those that have both a name in common and the same account. So all the things that are called from substances and differences are so called synonymously.

Every substance seems to signify a *this something*.[12] As far as primary substances are concerned, it is indisputable and true that each signifies a this something; for

8. $2^a29–34$.
9. Reading ἡ οὐσία.
10. $1^a24–25$.
11. $1^a6–7$.
12. I.e., a particular thing of some form or kind.

what is indicated is individual and one in number. But in the case of secondary substances, it seems from the appearance of the appellation that they too signify a this something, when one says [for instance] "human" or "animal." But it is not really so—rather, each signifies a certain sort;[13] for the subject is not one, as is a primary substance—rather, human and animal are said of many things. Yet a secondary substance does not simply signify a certain sort, as white does. White signifies nothing but a sort, whereas form and kind distinguish with respect to substance what sort it is of; for each of them signifies a certain sort of substance. (With a kind, the definition encompasses more than with a form; for saying "animal" embraces more than saying "human.")

Another characteristic of substances is that nothing is contrary to them. For what would be the contrary of a primary substance? For example, nothing is the contrary of a particular human, nor is anything the contrary of human or of animal. But this is not special to substance—it holds also of many other things, such as quantity; for nothing is the contrary of two cubits long, or of ten, or of any other such thing—unless someone says that many is the contrary of few, or large the contrary of small. But nothing is the contrary of any definite quantity.

It seems that substance does not admit of the more and the less. I do not mean that one substance is not more of a substance than another—indeed, I said[14] that it is so—rather, I mean that no substance is said to be more or less what it precisely is. For example, if this substance is a human, it will not be more or less a human, nor will this human be more or less a human than himself or than another. For one human being is not more a human being than another, as something white is whiter than another, or something beautiful is more so than another. And yet something may be said to be more or less than itself, as when a white body is said to be whiter now than before, and a hot body is called "hotter" or "less hot." But no substance is said of things in this way—for a human is not said to be more a human now than before, nor is any other thing among those that are substances. So the substance does not admit of more or less.

What seems most special to substance is that, while remaining the same and one in number, it can receive contraries. In no other case can one cite something one in number that can receive contraries. For example, a color that remains the same and is one in number will not be white and black; nor will the same action, one in number, be both bad and good; and similarly for other things that are not a substance. But a substance, while it remains the same and one in number, can receive contraries. One and the same human being, for example, comes to be pale at one time and dark at another, hot at one time and cold at another, bad at one time and good at another. This sort of thing is to be seen in no other case.

13. The word *poion* translated as "sort" is cognate with *poiotês*, the word for quality. It is used in Chapter 8 to apply exclusively to things in the category of quality, but in this passage it is used more broadly to apply to secondary substances.
14. 2^b6–22.

Someone might object by saying that statements and beliefs are also like this, for the same statement seems to be both true and false—for example, if the statement that someone is sitting is true, when the person stands, the same statement will be false. It is the same with beliefs, also. If one holds the true belief that someone is sitting, when the person stands—if one holds the same belief about him—the belief will be false. But even if we agree to this, there is still a difference in the way this happens. In the case of substances, it is because *they* undergo change that they can receive contraries; for what came to be cold from hot, or pale from dark, or bad from good, has changed (because it has altered). Similarly in other cases, each thing can receive contraries in that it undergoes a change itself. Statements and beliefs, however, remain themselves entirely unchanged; it is because the things change that the contrary comes about in the [statements or beliefs] about them; for the statement that someone is sitting remains the same, but it comes to be true at one time and false at another because the things change. It is the same with beliefs too. Thus, it would still be special about substance that it can receive contraries in this way—by a change in *itself*—even if one were to allow that statements and beliefs can receive contraries.

Yet even this is not true. For statements and beliefs are said to be receptive of contraries not because they receive any of the contraries in themselves, but because the affection comes to be in regard to something else. It is because of what the thing is, or is not, that a statement is said to be true or false, not because it can itself receive contraries; for, unconditionally speaking, no statement or belief is changed by anything at all. So since nothing happens to them, they are not receptive of contraries after all. But a substance receives contraries in itself, and this is the reason it is called "receptive of contraries"; for it receives illness and health, or paleness and darkness, and it is said to be receptive of contraries because it itself receives each such contrary. Thus, it is special to substance that something that remains the same and is one in number can receive contraries. Let this much, then, be said about substance.

6
Quantity

Some quantities are discrete, others are continuous. Some quantities are composed of parts which have a position in relation to each other, while others are composed without [such] a position.

Discrete quantities include, for example, number and speech; continuous ones include line, surface, body, and, in addition to these, time and place. For there is no common boundary of the parts of a number at which its parts meet—for example, if the parts of ten are fives, the two fives do not meet at a common boundary; rather, they are discrete. Nor do three and seven meet at a common boundary. And in general you cannot find a common boundary for the parts of any number—they are always discrete. So number is one of the discrete quantities. Similarly, speech is among the

discrete quantities. (That speech is a quantity is obvious, for it is measured by long and short syllables. Of course, I mean speech that is produced with a voice.) For their parts do not meet at any common boundary. There is no common boundary at which the syllables meet—but each in itself is discrete.

5a1 A line, on the other hand, is continuous; for there is a common boundary at which its parts meet—a point. And the parts of a surface meet at a line, for the parts of a plane meet at a certain common boundary. Similarly, for a body you can find a common boundary—a line or surface—at which the parts of the body meet. Time and place are also like this; for the present time meets both the past time and the future time. Place too is one of the continuous quantities; for the parts of a body occupy a certain place, and these parts meet at a certain common boundary. And so those parts of a place which each of the parts of a body occupies meet at the same boundary at which the parts of the body also meet. So place is also continuous; for its parts meet at one common boundary.

Further, some quantities are composed of parts which have a position in relation to each other, and some are not composed of parts which have [such] a position—for example, the parts of a line have a position in relation to each other; for each of them lies somewhere, and you can distinguish them and specify where on the plane each one lies and which of the remaining parts it meets. Similarly, the parts of a plane have a certain position; for you can specify in the same way where each one lies, and which ones adjoin each other. It is the same with both the parts of a solid and those of a place.

But the parts of a number, on the other hand, cannot be looked upon as having some position in relation to each other, or as lying somewhere, or as to which ones meet each other. Nor can the parts of time; for none of the parts of time endures, and how can what does not endure have any position? Rather, you might say that they have a certain order in that some parts of time are earlier and others later. And it is the same with number, in that in counting, one comes before two and two before three. Thus, numbers might have a certain order, but definitely you cannot find them having a position. It is the same with speech. For none of its parts endures—it is uttered, and then it is gone. So its parts do not have any position if none of them endures. Some quantities are composed of parts that have a position, then, while others are not composed of parts that have a position.

Only those we have mentioned are said to be quantities in the strict sense; all the others are said to be such coincidentally. For it is with an eye toward the ones we have mentioned that we also call the others "quantities." For example, there is said to be a **5b1** large amount of white insofar as the surface is large, and an action or a movement is said to be lengthy insofar as its duration is long. For it is not intrinsically that each of these is said to be a quantity—for example, if one were to give the quantity of some action, one would bound it temporally by specifying it as "yearlong," or something of the sort. And in speaking of a quantity of white, one would bound it by giving its surface; for of whatever size the surface is, one will say there is that much white. So

only those things we have mentioned are said to be quantities in the strict sense and intrinsically. Among the rest, none is a quantity intrinsically, but is so coincidentally, if at all.

Moreover, there is no contrary to a quantity. (It is clear that there is no contrary in the case of any of the definite quantities. There is, for example, nothing contrary to two cubits, three cubits, a surface, or anything like that.) But might not one say that many is contrary to few, or large to small? None of these, however, is a quantity; rather, they are relatives. For nothing is said to be large or small intrinsically, but only with reference to something else—for example, a mountain is called "small," and a millet seed "large," insofar as the latter is large among things of its kind, and the former small among things of its kind. There is, then, a reference to something else, since if a thing were said to be small or large intrinsically, the mountain would never be said to be small, or the millet seed large. Again, we say there are many people in the village, and few here in Athens—though there are many times as many here. And we say there are many in the house, and few here in the theater—though there are many more here. Further, two cubits, three cubits, and each thing of that sort signifies a quantity, but neither large nor small signifies a quantity; rather, each of them signifies a relative, for the large and the small are considered in relation to something else. So it is evident that they are relatives.

Further, whether one regards them as quantities or not, there is nothing contrary to them; for how can there be a contrary to what cannot be taken intrinsically, but only with reference to something else? Besides, if large and small are contraries, it will follow that the same thing at the same time admits of contraries, and that things will be their own contraries; for the same thing happens to be at the same time both large and small; for in relation to this it is small and in relation to that the very same thing is large. So it follows that the same thing happens to be both large and small at the same time, with the result that it admits of the contraries at the same time.

But it seems that nothing admits of contraries at the same time. Although a substance, for example, is thought to be able to receive contraries, it will certainly not be ill and healthy at the same time, nor white and black at the same time; nor does anything else admit of contraries at the same time. Otherwise, it turns out that some things are their own contraries; for if large is contrary to small and the same thing is at the same time large and small, that thing would be contrary to itself. But it is impossible that a thing should be contrary to itself. Therefore, large is not contrary to small, nor many contrary to few. So even if someone should say that these are not relatives but rather quantities, still they will have no contrary.

But it seems to be most of all with respect to place that there is contrariety of quantity; for people take *up* to be contrary to *down*, meaning by "down" the region toward the center, because the greatest distance is the one from the outer limits of the cosmos to the center. It seems likely that it is from these that they also derive their definition of other contraries; for they define as contraries things in the same kind that are at the greatest distance from each other.

It seems that a quantity does not admit of the more and the less—for example, one two-cubit length is not more two cubits than another. Nor does a number admit of more or less—for example, we do not say that three is more three than five, nor that one three is more three than another. Nor even is one time called "more" a time than another. Nor is any one of the items we have discussed said to be more or less. So quantity does not admit of the more and the less.

What is most special of all to a quantity is that it is said to be both equal and unequal. For each of the quantities we have discussed is said to be both equal and unequal. A body, for example, is said to be both equal and unequal; and a number is said to be both equal and unequal; and a time is said to be both equal and unequal. Similarly for the other things we have discussed, each is said to be both equal and unequal. Among the remaining things that are not quantities, it would seem that none is said to be both equal and unequal. A disposition, for example, is certainly not said to be equal and unequal, but rather similar; and white is certainly not both equal and unequal, but rather similar. So what would be most special of all to a quantity is that it is said to be both equal and unequal.

7
Relatives

The things that are said to be relatives are those that are said to be precisely what they are either *of* (or *than* or *to*)[15] other things or, in some other way, in relation to another thing. For example, what is larger is said to be precisely what it is *than* another—for it is said to be larger than something; and what is double is said to be precisely what it is *of* another—for it is said to be the double of something. It is the same with all other such things. Such things as a state, disposition, perception, scientific knowledge, or position are also to be included among relatives; for each of the aforementioned things is said to be precisely what it is (and not something else) *of* other things; for a state is said to be the state *of* something, scientific knowledge the scientific knowledge *of* something, a position the position *of* something, and so on for the rest. Relatives, then, are those things that are said to be precisely what they are *of* other things, or in some other way in relation to another thing. For example, a mountain is said to be large in relation to another [mountain] (for a mountain is said to be large in relation to something) and what is similar is said to be similar to something; and all things such as these are, in like manner, said in relation to something.

Lying, standing, and sitting are positions, and position is a relative. To be lying, to be standing, and to be sitting, however, are not positions, but things are so called paronymously after the aforementioned positions.

15. Aristotle does not give a list of prepositions; rather, he just uses the genitive *heterôn* ("other things").

There is also contrariety among relatives—for example, virtue is contrary to vice, each of which is relative to something, as scientific knowledge is to ignorance. But not all relatives have contraries; for nothing is contrary to double or triple or any other such thing.

Relatives seem to also admit of the more and the less; for what is similar is said to be more so or less so, and what is unequal is said to be more so or less so, and each of these is a relative—for what is similar is said to be similar *to* something, and what is unequal is said to be unequal *to* something. But not all relatives admit of the more and less; for what is double is not said to be more double or less double, nor is any other such thing.

Every relative is said to be related to things that are conversely related to it—for example, a slave is said to be slave of a master, and the master is said to be master of the slave; a double is said to be double of a half, and the half is said to be half of its double; and the greater is said to be greater than the lesser and the lesser is said to be lesser than the greater. It is the same with the rest. Sometimes, however, there will be a grammatical difference in case-ending[16]—for example, scientific knowledge is said to be scientific knowledge *of* what is scientifically knowable, and what is scientifically knowable is said to be scientifically knowable *by* scientific knowledge; and perception is called perception *of* what is perceptible, and what is perceptible is perceptible *by* perception.

Sometimes the converse will not seem to hold, if the speaker makes a mistake and does not give properly what a relative is said to be related to—for example, if a wing is given as being "of a bird," the bird is not conversely "of a wing";[17] for giving "wing of a bird" was not giving it properly in the first place. For it is not insofar as it is a bird that a wing is said to be a wing of it, but insofar as it is winged; for there are wings of many other things which are not birds. So if a relation is given properly, the converse also holds—for example, "a wing is the wing of what is winged" and "what is winged is winged thanks to a wing."

Sometimes it may be necessary to even make up a name, if there is no established name that properly gives what a relative is related to—for example, if you give "rudder of a boat," this is not done properly; for it is not insofar as it is a boat that a rudder is said to be the rudder of it; for there are boats which do not have rudders. Thus, the converse does not hold; for a boat is not said to be "boat of a rudder." But perhaps it would be giving it more properly if one were to give it in some way such as this: that a rudder is the rudder of (or in some other way related to) what is "ruddered" (there being no established name). And when given properly, the converse does hold—for what is ruddered is ruddered thanks to a rudder. It is the same with other cases. For

16. If *F*s are the *F*s of *G*s, it follows that *G*s are the *G*s of *F*s, but the expression for "of *F*s" in Greek may be either in the genitive case or in the dative case.

17. Aristotle later (8^a28–35) revises his definition of relatives, so that parts of things (wings, heads, hands, rudders, etc.) no longer count as relatives. He makes this point explicitly at 8^b15–19.

example, a head would more properly be given as the head of what is "headed" than as the head of an animal; for it is not insofar as it is an animal that it has a head; for many animals do not have a head. Thus, perhaps one would most easily grasp the things which do not have established names if one were to derive the names of the conversely related things from the names of the original relatives, just as, in the cases discussed, "winged" was derived from "wing" and "ruddered" from "rudder."

Thus, when properly given, every relative, *R*, is said in relation to something conversely related to it. Whereas, if we give it as being related to some random thing, rather than to the very thing in relation to which it is said, then the converse will not hold. I mean that not even among relatives, *R*, that are admittedly said in relation to things that are conversely related to them and have established names, will the converse hold, if these relatives are given as being related to coincidents rather than to the very things in relation to which they are so called. If "slave," for example, is given, not as "slave of a master," but as "of a human," or "of a two-footed [animal]," or something like that, then the converse will not hold; for this way of giving it is not proper.[18]

Further, if what a relative, *R*, is said in relation to is given properly, then, if all coincidents are taken away and all that is left is only that to which it is properly given as related to, it will always be said to be related to that—for example, if it is in relation to a master that someone is said to be a slave, then, if all coincidents attached to the master are taken away (such as his being two-footed, receptive of scientific knowledge, a human) and all that is left is that he is a master, the slave will always be said to be a slave in relation to that; for a slave is said to be slave of a master. But if what a relative, *R*, is so called in relation to is given improperly, then, if everything else is taken away and all that is left is only what it was given as related to, it will not be said to be related to that. For suppose you give "slave of a human" or "wing of a bird." Now, take away from the human his being a master. Then the slave will not be said to be a slave in relation to a human; for, if there is no master, there is no slave either. And in the same way, if you take away from the bird its being winged, the wing will not be a relative anymore; for, if there is nothing winged, there will not be a wing *of* anything either.

So one must give whatever a relative, *R*, is properly said in relation to. If there is an established name, this is easily done; if there is none, it may be necessary to make up a name. When names are given in this way, it is clear that every relative, *R*, will be said in relation to something conversely related to it.

It seems that relatives are by nature simultaneous. And in most cases this is true; for at the same time there is a double there is also a half, and when there is a half there is a double; and when there is a slave there is a master. The others too are like these.

18. I.e., for every relation, *R*, there is a converse relation, *Ř*, such that for any *x* and any *y*, *xRy* if, and only if, *yŘx*. Thus, for example, *the parent of* relation is the converse of *the child of* relation.

And the one does away with the other along with it; for when there is no double there is no half, and when there is no half there is no double. It is the same with others like these. But it does not seem to be true of all relatives that they are simultaneous by nature; for what is scientifically knowable would seem to be prior to scientific knowledge; for we gain scientific knowledge, for the most part, of already existing things. In few cases, or none at all, could one find scientific knowledge coming to be at the same time as what is scientifically knowable. Further, although when what is scientifically knowable has ceased to exist, it also makes scientific knowledge cease to exist along with it, scientific knowledge does not make what is scientifically knowable cease to exist along with it. For when there is nothing scientifically knowable there is no scientific knowledge—for there will no longer be scientific knowledge of anything—but nothing prevents there being something scientifically knowable when there is no scientific knowledge—for example, squaring the circle, if indeed it is scientifically knowable, is scientifically knowable even though there is as yet no scientific knowledge of it. Further, if an animal ceases to exist, there will be no scientific knowledge [of it], although there may be many things that are scientifically knowable.

The situation with perception is the same; for the perceptible seems to be prior to perception; for although when the perceptible ceases to exist, it makes perception cease to exist along with it, perception does not make the perceptible cease to exist along with it. For the perceptual modalities deal with bodies and are in bodies, and if something perceptible ceases to exist, a body will also cease to exist—for a body, too, is something perceptible—and if there were no bodies, perception would cease to exist. So perception ceases to exist along with the perceptible. But the perceptible does not cease to exist along with perception; for with the cessation of animal's existence, perception would cease to exist, but there would still be things that are perceptible, such as body, heat, sweet, bitter, and all other perceptible things. Further, perception comes into being at the same time as what is capable of perceiving—for animal and perception come into being at the same time—but the perceptible exists even before there is perception; for fire and water and the like, of which animals are composed, exist even before there is any animal at all, or any perception. So the perceptible would seem to be prior to perception.

There is a puzzle about whether, as it would seem, no substance is said to be among the relatives, or whether this is a possibility with respect to some secondary substances. It is true as far as primary substances are concerned, for neither wholes nor parts are said in relation to something. Thus, a particular human is not said to be a particular human of something, nor a particular ox a particular ox of something. It is the same way with parts; for a particular hand is not said to be a *particular* hand of something but rather a hand of something; and a particular head is not said to be a *particular* head of something but rather a head of something. It is the same with secondary substances, at least with most of them—for example, a human is not said to be a human of something, nor an ox, ox of something, nor a wooden

log, wooden log of something—but rather they are said to be someone's possession. In such cases as these, then, it is clear that substances are not relatives; but there is a dispute concerning some secondary substances. A head, for example, is called a head *of* something, and a hand, hand *of* something, and so on for similar cases. So these would seem to be relatives.

Thus, if the definition given[19] of relatives is sufficient, then it is either very difficult or else impossible to arrive at the solution that no substance is said to be a relative. However, if the definition is not sufficient, but rather relatives are those things the being for which is the same as their standing in a certain relation to something, then perhaps something might be said in reply. The earlier definition does indeed fit all relatives, but this—their being said to be precisely what they are *of* other things—is not what their being relatives consists in.

It is clear from these considerations that if one knows definitely that something is a relative, then one will know definitely what it is said in relation to. This is also self-evident. For if someone knows of a certain this something that it is a relative, and the being for relatives is the same as being somehow related to something, then one also knows what it is somehow related to; for if one does not know at all what it is somehow related to, then one will not know whether it is somehow related to anything. Clearly it is this way in particular cases—for example, if one knows definitely of a this something that it is a double, one will at once know definitely what it is the double of; for if there is no definite thing that one knows it to be the double of, one does not at all know whether it is a double either. Similarly, if one knows of a this something that it is better, one must know definitely what it is better than, because of this: it is not just that one will know indefinitely that it is better than something worse; for that sort of thing is a supposition, not scientific knowledge; for in that case one will not have an exact knowledge of its being better than something worse; it may happen that nothing is worse than it is. So it is evident that it is necessary for one who knows some relative definitely to also know definitely what it is said in relation to.

But now with respect to a head, a hand, and to each of the things that are substances, it is possible to know definitely what precisely it is; and it is not necessary to know what it is said in relation to. For it is not necessary to know[20] definitely whose head this is, or whose hand. So these would not be relatives. And if *they* are not relatives, it would be true to say that no substance is a relative.

It is perhaps difficult to give a strong opinion on such matters, if one has not gone over them many times. But to go through all the puzzles concerning each of them is not completely useless.

19. At 6^a36–37.

20. Reading οὐκ ἀναγκαῖον ἔστιν.

8
Quality

By "quality" I mean that in accord with which people are said to be of some sort.[21] But something is said to be a quality in many ways.

Let us say that a state or a disposition is one form of quality. States, such as the branches of scientific knowledge and the virtues, differ from dispositions in that they are more stable and longer-lasting; for scientific knowledge seems to be highly stable and hard to remove—even if one has a mediocre grasp of that scientific knowledge, granting that he suffers no great change through illness or something else of the same sort. And the same thing is true of virtue. Justice, for example, and temperance and each of the others, seem not easily removed or changed.

But things that are easily removed and quickly changed—heat, for example, and cold and illness and health and other things like that—are called "dispositions"; for a human being is disposed in some way in accord with these, but he changes quickly from hot to cold and from being healthy to being ill. It is the same with the rest, unless even one of these should happen, due to length of time, to have become natural and either incurable or extremely hard to remove, and then one might perhaps call it a "state." It is evident, though, that one tends to call "states" those things that are longer-lasting and harder to remove; for people who do not have a complete grasp of a branch of scientific knowledge, but rather change their minds easily, are not said to possess the state. And yet they are disposed in some way, better or worse, with respect to that scientific knowledge. So a state differs from a disposition in that the latter is easily removed, whereas the former is longer-lasting and harder to remove.

On the other hand, states are also dispositions, while dispositions are not necessarily states; for anyone in a state is thereby also disposed in some way in accord with it, whereas those who are disposed are not in every case in a state.

Another [second] kind of quality is that in accord with which we call people "good at boxing," "good at running," "healthy," or "sickly"—in a word, whatever they are said to be in accord with a natural capacity or incapacity; for one is said to be each of these things not because one is disposed in some way, but because one has a natural capacity to do something easily or not to be affected by something. For example, people are called "good at boxing" or "good at running," not because they are disposed in some way, but because they have a natural capacity to do something easily; and they are called "healthy" because they have a natural capacity not to be easily affected by what happens to them, and "sickly" because they have an incapacity for not being affected by something. Being hard and soft are similar; for a thing is said to be hard because it has the capacity to not be divided easily, and soft because it has an incapacity for the same thing.

21. 3^b16.

Affective qualities and affections make up a third kind of quality. Examples of these are sweetness and bitterness, sourness, and everything akin to these, and also heat and cold, and paleness and blackness. That these are qualities is evident; for it is in accord with them that what has taken them on is said to be of some sort—for example, honey is said to be sweet because it has taken on sweetness, and a body is said to be pale because it has taken on paleness. And it is the same with the others. They are called "affective qualities" not because what has taken on these qualities has been somehow affected—for honey is not said to be sweet because it has been somehow affected, nor is this the case with any other such thing. Similarly, heat and cold are called "affective qualities" not because what has taken them on is somehow affected, but it is because each of the qualities mentioned produces an affection in connection with the perceptual modalities that they are called "affective qualities"; for sweetness produces some affection in connection with taste, and heat one with touch, and similarly for the others.

Paleness and darkness and the other colors are called "affective qualities," not in the same way as those just mentioned, but because they are brought about by affections. Now, it is clear that many changes of color are brought about by an affection; for when one is ashamed one turns red, when one is afraid one turns pale, and so forth. And so if someone is by nature affected with any such affection, it makes perfect sense that he will have the associated color; for the same bodily disposition that now comes about when one is ashamed might also come about in accord with one's natural constitution, so that it might also be by nature that one comes to have the associated color.

Among these things that happen to one, those which originate from affections that are hard to remove and highly stable are called "qualities"; for if paleness or darkness comes about as part of one's natural constitution, it is said to be a quality (for we are said to be of some sort in accord with these); and if paleness and darkness have come about due to long illness or sunburn and are not easily gotten over, or even last through life, then these too are called "qualities" (for we are similarly said to be of some sort in accord with them). But those which come about from what is easily parted with and quickly gotten over are called "affections"; for people are not said to be of some sort in accord with them; for a person who turns red due to shame is not called "ruddy," nor is a person who turns pale due to fear called "pallid"; rather, they are said to have been affected by something. So such things are said to be affections, but not qualities.[22]

In much the same way we also speak of affective qualities and affections with regard to the soul. For those that come to be at the moment of birth as a result of some affection are called "qualities"—for example, mania and anger and the like; for in accord with

22. The earlier assertion that affective qualities and affections make up a third sort of quality (9ª28–29) should, perhaps, be taken to mean that those affections that are qualities constitute a third kind.

them people are said to be of some sort—angry or manic. It is the same with aberrations that are not congenital but come to be from something else that can happen to one and are either hard to get rid of or even completely irremovable: these too are qualities; for people are said to be of some sort in accord with them. But when they arise from what is quickly gotten over, they are called "affections," as when a person in pain is rather angry; for a person who is rather angry when in the grip of such an affection is not said to be an angry person, but rather is said to be affected by something. So such things are said to be affections, but not qualities.

Figure and the shape that belongs to each thing, and further, in addition to these, straightness and curvedness and if there is something similar to them, make up a fourth kind of quality; for in accord with each of these a thing is said to be of some sort; for a thing is said to be of some sort on account of being a triangle or a square, and also on account of being straight or curved, and each thing is said to be of some sort in accord with its shape.

Rare and dense and rough and smooth might seem to signify qualities. However, it seems that such things are foreign to a classification of qualities, for it appears rather that each of them indicates some arrangement of parts; for a thing is dense because its parts are close to each other, and rare because its parts are separated from each other; it is smooth because its parts lie somehow along a straight line, and rough because some parts stick out and others recede.

Perhaps some other mode of quality might be brought to light; but these are pretty much the ones mentioned most.

What we have mentioned above, then, are qualities; and things that are of some sort are those that are called in accord with them paronymously or else in some other way. In most cases, indeed in pretty much all cases, they are said of things paronymously—for example, a person is said to be pale from paleness or grammatical from grammar, and just from justice, and similarly for the rest. However, in some cases, when there are no established names for the qualities, it is not possible to be called something from them paronymously. For example, a person good at running or boxing,[23] who is so called in accord with a natural capacity, is not said to be such paronymously from any quality; for there are no established names for these natural capacities in accord with which people are said to be of some sort, as there are for the scientific knowledge from which people are called "expert boxers" and "expert wrestlers" in accord with a disposition. (For boxing is said to be scientific knowledge, as is wrestling, and it is from these paronymously that those who are so disposed are said to be of some sort.)

In some cases, even where there is an established name [for a quality], a thing that is said to be of some sort in accord with it is not so called paronymously—for

23. When the name *puktikos* is used to pick out a natural boxer, the person cannot be called a "boxer" paronymously from a natural talent because there is no name for such a talent. But when it is used to pick out an expert, the person is called a "boxer" paronymously after the science of boxing, for which there is a name (*puktikê*).

example, a person is not called "excellent" from the name "virtue"; for a person is said to be excellent due to having virtue, but is not so called paronymously from virtue. But it is not like this in many cases. So things that are called from the aforementioned qualities, either paronymously or from them in some other way, are said to be of some sort.

There is also contrariety in accord with quality. Justice, for example, is contrary to injustice, and paleness to darkness, and similarly for the rest, and also for things said to be of such-and-such a quality in accord with these; the unjust, for example, is contrary to the just, and the pale to the dark. However, it is not so in all cases; for nothing is contrary to red or to yellow or to similar colors, although they are qualities.

Moreover, if one of two contraries is a quality, the other will also be a quality. This is clear if we first consider the other categories. If, for example, justice is contrary to injustice and justice is a quality, injustice will be a quality too; for none of the other categories fits injustice—neither quantity nor relation nor place nor, in short, any such thing besides quality. And the same thing holds for other contraries in accord with quality.

Qualities also admit of the more and the less; for one thing is called "more" or "less" pale than another, and one thing more just than another. And a thing can become more so; for a thing that is pale is capable of becoming even paler.

Still, this is not so in all cases, but only in most; for one might raise a puzzle whether one case of justice can be said to be more a case of justice than another, and similarly concerning other dispositions. For some people dispute such claims; for they deny altogether that one case of justice can be called "more" or "less" a case of justice than another, or one case of health more or less a case of health than another, although they do say that one thing can have less health than another, and one thing less justice than another, and so on for grammatical knowledge and the other dispositions. But, at any rate, it is indisputable that the things called in accord with these admit of the more and the less; for one person can be called "more grammatical" than another, or "more just," or "healthier," and so on for the rest.

But triangle and square do not seem to admit of more, nor does any other figure; for things that admit of the account of a triangle or that of a circle are all equally triangles or circles, whereas none of the things that do not admit of it is called "more" [a triangle or a circle] than another; for a square is not more of a circle than an oblong is; for neither one admits of the account of a circle. And in general, unless two things both admit of the account of a given thing, neither one will be called "more" that thing than the other. Hence not all qualities admit of the more and the less.

None of the things so far mentioned is special to quality. But it is in accord with qualities alone that things are said to be similar or dissimilar; for one thing is not similar to another in accord with anything else except that in accord with which it is of some sort. So what is special about quality would be that it is in accord with it that things are said to be similar or dissimilar.

We need not be alarmed if someone should tell us that although we proposed to discuss quality we have also included many relatives; for states and dispositions are relatives. For in pretty much all such cases the kinds are so called in relation to something, but none of its particular [forms] is. Thus while scientific knowledge, which is a kind, is said to be precisely what it is *of* something else (for it is called a scientific knowledge *of* something), none of its particular [forms] is said to be precisely what it is *of* something else. For example, grammar is not said to be grammar of something, nor is music said to be music of something. But if these too are said in relation to something, then it will be in accord with the kind—for example, grammar is said to be the scientific knowledge of something, not the grammar of something; and music the scientific knowledge of something, not the music of something. So the particular [branches of scientific knowledge] are not relatives. But we are said to be of some sort in accord with the particular [branches of] scientific knowledge; for it is them that we do have—indeed, we are called "scientific knowers" on account of possessing one of the particular [branches] of scientific knowledge. So it would be the particular [branches of] scientific knowledge that are qualities, precisely those[24] in accord with which we are said to be of some sort; and these are not relatives.[25]

Still, if the same thing happens to be both a quality and a relative, it is not at all absurd for it to be included in both these kinds.[26]

9
Doing, Being Affected, and the Rest of the Categories

Both doing and being affected admit of contrariety and of the more and the less; for heating is contrary to cooling, and being heated to being cooled, and being pleased to being pained. So they admit of contrariety. But they also admit of the more and the less; for it is possible to heat more or less and to be heated more or less, and to be pained more or less. Thus doing and being affected admit of the more and the less.[27] **11^b1**

[This, then, is as much as is said about these matters. But on the topic of being arranged, it was remarked[28] (in the discussion of relatives) that things are said paronymously from positions. But about the rest—about when and where and having on—since they are quite perspicuous, nothing else is said about them except what

24. Reading καθ' ἅσπερ.
25. *Top*. $124^b15–22$.
26. *Met*. $1021^b3–8$.
27. Aristotle's discussion of individual categories breaks off at this point in an incomplete state. The following chapters (10–15) discuss various topics that pertain to more than one category. The remainder of 9 ($11^b10–16$), which serves as a transition to those chapters, along with the first sentence of 10 ($11^b15–16$), were probably inserted here by a later editor.
28. $6^b11–14$.

was said at the start[29] (that having shoes on and having armor on signify *having on*, and that in the Lyceum, for example, signifies *where*—and whatever else was said about these).]

10
Opposites

What has been said, then, about the kinds put forward is sufficient; but we have still to discuss opposites, and in how many ways things are usually opposed.

There are four ways in which things are said to be opposed to each other—either as relatives, as contraries, as privation and state,[30] or as affirmation and denial. To speak in outline about each of these ways of being opposed, an example of being opposed as relatives is double to half; as contraries, bad to good; as privation and state, blindness to sight; as affirmation and denial, he is sitting—he is not sitting.

Things opposed as relatives are said to be precisely what they are *of* their opposites, or in some other way in relation to them. For example, double is said to be precisely what it is—double—of half. Also, scientific knowledge and what is scientifically knowable are opposed as relatives, and scientific knowledge is said to be precisely what it is *of* what is scientifically knowable. And the scientifically knowable is said to be precisely what it is in relation to its opposite, scientific knowledge. For what is scientifically knowable is said to be scientifically knowable *by* something—by scientific knowledge. So things opposed as relatives are said to be precisely what they are *of* their opposites, or in some way *in relation to* each other.

Things opposed as contraries, however, while in no way said to be precisely what they are in relation to each other, are nonetheless said to be *contraries of* each other; for the good is not said to be the good of the bad, but the contrary of it; and the white is not said to be the white of the black, but its contrary. So these oppositions differ from each other.

When it is necessary for either one or the other of a pair of contraries to belong to the things in which they naturally occur, or of which they are predicated, there is no intermediate between them.[31] For example, illness and health naturally occur in the body of an animal, and it is necessary for either one or the other, either illness or health, to belong to the body of an animal; also, odd and even are predicated of numbers, and it is necessary for either one or the other, either odd or even, to belong to a number. And there is nothing at all intermediate between these, either between illness and health or between odd and even. But those of which it is not necessary for either one or the other to belong [to the things in which they naturally occur] do have

29. 2^a1–3.

30. There is an etymological connection between the noun *hexis* ("state") and the verb *echein* ("have") that is not apparent in the translation.

31. 12^a2–4 is secluded as an interpolation; it appears at 12^a9–11.

something intermediate between them. For example, black and white naturally occur in bodies, and it is not necessary for one or the other of them to belong to a body (for not every body is either white or black); also, while bad and good can be predicated both of humans and of many other things, it is not necessary for either one or the other of them to belong to those things of which they can be predicated; for not all of them are either bad or good. And there *is* something intermediate between these; for example, between white and black are gray and yellow and the other colors, between bad and good is what is neither bad nor good. In some cases there are established names for the intermediates, for example, gray and yellow between white and black; but in some cases, where it is not easy to link the intermediate to a name, the intermediate is specified by the denial of each of the extremes, for example, "what is neither good nor bad" and "what is neither just nor unjust."

Privation and state are so called in regard to the same thing—for example, "sight" and "blindness" in regard to the eye. To speak in universal terms, they are both said in regard to that in which the state naturally occurs. And we say that a thing capable of admitting a state is deprived of it if the state naturally belongs to that thing, but does not belong to it at all at a time when it would be natural for the thing to have it; for it is not what lacks teeth that we call "toothless," or what lacks sight that we call "blind," but what lacks these at a time when it would be natural for it to have them; for some things have neither sight nor teeth from birth, but they are not called "toothless" or "blind."

But being deprived is not a privation, and having a state is not a state; for sight is a state, and blindness is a privation, but *having* sight is not sight, and *being* blind is not blindness; for blindness is a certain privation, and being blind is being deprived of something, but it is not a privation. Further, if blindness were the same as being blind, both would be predicated of the same thing. But whereas a human being may be called "blind," a human being is in no way called "blindness." Yet it seems that these too—being deprived and having a state—are opposed as privation and state **$12^{b}1$** are; for the mode of opposition is the same—as blindness is opposed to sight, in just the same way being blind is opposed to having sight. Nor is what an affirmation or a denial is about an affirmation or a denial; for whereas an affirmation is an affirmative statement and a denial is a negative statement, none of the things an affirmation or a denial is about is a statement. Still, they too are said to be opposed to each other as affirmation and denial are; for in these instances too, the mode of opposition is the same; for in whatever way an affirmation and a denial—for example, "he is sitting" and "he is not sitting"—are opposed, that is the way the actual things each is about—the sitting and the not sitting—are also opposed.

It is evident that privation and state are not opposed as relatives; for neither is said to be precisely what it is *of* its opposite; for sight is not the sight *of* blindness, nor is it said in any other way in relation to it. Nor, in the same way, would blindness be said to be the blindness *of* sight, but rather blindness is said to be the privation of sight, not blindness of sight. Further, all relatives are said in relation to things conversely

related to them. So if blindness were a relative, then that in relation to which it is said would also be conversely related to it. But the converse does not hold; for sight is not said to be sight of blindness.

That things said as privation and state are not opposed as contraries either is clear from the following. Among contraries that have nothing intermediate between them, it is necessary for one or the other always to belong to the things in which they occur by nature, or of which they are predicated; for those with nothing intermediate between them were just those of which it is necessary that one or the other belong to what is receptive of them, such as with illness and health or odd and even. But of those that have something intermediate between them, it is never necessary for one or the other to belong to everything [receptive of them]; for it is not necessary that everything be white or black (or hot or cold) that is receptive of them; for there is nothing to prevent something intermediate between these from belonging. Further, those with something intermediate between them were just those of which it is not necessary that one or the other belong to what is receptive of them, unless there is one of them that belongs to those things by nature, as being hot belongs to fire and being white belongs to snow. And with these it is necessary that it be definitely one or the other that belongs, not just whichever one of them happens to do so; for it is not possible for fire to be cold, or for snow to be black. So it is not necessary for one or the other to belong to everything that is receptive of them, but only to those things to which one of them belongs by nature, and to which it is definitely one of them that belongs, and not whichever of the two happens to.

But neither of the things just mentioned is true of privation and state; for it is not necessary that one or the other of these always belongs to what is receptive of them; for a thing for which it is not yet natural to have sight is not said either to be blind or to have sight. So these would not be among the contraries that have nothing intermediate between them. Nor, however, would they be of the sort that do have something intermediate between them; for it is necessary that one or the other of them belongs at some time to everything receptive of them; for once it is natural for a thing to have sight, that thing will then be said either to be blind or to have sight; and not definitely one or the other of these, but whichever of the two happens to belong. For it is not necessary either for it to be blind or for it to have sight; rather, one or the other just happens to belong to it. But contraries with something intermediate between them were ones of which it is never necessary that one or the other belongs to everything [receptive of them]. Rather, they belong to some, and to these there is definitely one that belongs. So it is clear that things opposed as privation and state are opposed in neither of the ways in which contraries are.

Further, it is possible for there to be change from one contrary into the other as long as there is something to receive them—unless one of them belongs to something by nature, as, for example, being hot belongs to fire; for the healthy can become ill, and what is white can come to be black, and what is cold hot. And it is possible to come to be base from being excellent, and come to be excellent from being base.

(For a base person, if led into better ways of living and speaking, may show some improvement, even if only a little bit, toward being a better person. But if he should once improve a little, it is evident that he might change completely or improve a great deal; for even if he improves just a little from his starting-point, he keeps getting more inclined toward virtue, so that he is likely to improve even more. And if this keeps happening, he will be restored completely to the contrary state—if time is not exhausted.) But with privation and state it is impossible for there to be change into each other; for change comes to be from the state to the privation, whereas change from the privation to the state is impossible; for someone who has become blind does not see again, nor does a bald man recover his hair, nor does a toothless man grow teeth.

It is evident that things opposed as affirmation and denial are opposed in none of the ways we have discussed; for only with these is it always necessary for one of them to be true and one false. For neither with contraries, nor with relatives, nor with state and privation, is it necessary that always one be true and the other false. Health and illness, for example, are contraries; and neither one is either true or false. Similarly, double and half are opposed as relatives, and neither of them is either true or false. Nor are even those that are opposed as privation and state, for example, sight and blindness. In general, nothing said without any combination is either true or false; and all the things mentioned are said without combination.

Contraries said in combination might certainly seem to share this feature[32]—for "Socrates is well" is contrary to "Socrates is ill." But even with these it is not necessary that always one be true and the other false; for if Socrates exists, one will be true and one false, but if he does not exist, both will be false. For neither "Socrates is ill" nor "Socrates is well" is true if Socrates himself does not exist at all. With privation and state, if he does not exist at all, neither one is true, while if he does exist, it is not always the case that one or the other is true; for "Socrates has sight" is opposed to "Socrates is blind" as privation and state, and even if he exists it is not necessary for one or the other to be true or false (for when it is not yet natural for him to have [sight], both are false). And if Socrates does not exist at all, then again both are false, both "he has sight" and "he is blind." But with affirmation and denial it will always hold, whether he exists or not, that one is false and the other true; for with "Socrates is ill" and "Socrates is not ill," if he exists, it is obvious that one of them is true and the other false, and similarly if he does not exist; for if he does not exist, "he is ill" is false and "he is not ill" is true.[33] So the only things to which it would be special that always one of them is true and the other false are those opposed as affirmation and denial.

$13^{b}1$

32. I.e., that it is always necessary for one of them to be true and one false.

33. "Socrates is well" and "Socrates is ill" both assert that Socrates exists. If he exists, they have opposite truth values, which are determined by his health; if he does not exist, they are both false. Their negations ("Socrates is not well" and "Socrates is not ill") are merely denials of the corresponding affirmations. So while if he exists they have opposite truth values, if he does not exist they are both true.

11
Contraries

The contrary to a good thing is necessarily a bad thing. This is clear by induction—for example, illness is contrary to health, injustice to justice, cowardice to courage, and
14a1 similarly for the rest. But it is sometimes a good thing and sometimes a bad thing that is contrary to a bad thing; for excess, which is a bad thing, is contrary to deficiency, which is a bad thing. Likewise the mean, which is good, is contrary to both [excess and deficiency]. Although one may see this sort of thing in a few cases, in most cases
5 a good thing is always contrary to a bad thing.

Moreover, with contraries it is not necessary that, if one exists, the other will too; for if everyone were healthy, health would exist, but illness would not. Similarly, if everything were white, whiteness would exist, but blackness would not. Further, if
10 Socrates' being healthy is contrary to Socrates' being ill, and it is not possible for both to belong to him at the same time, if one of the contraries existed it would not be possible for the other to exist as well; for if it were the case that Socrates is healthy, it would not be the case that Socrates is ill.

It is clear that it is the nature of contraries to occur in things that are the same
15 either in form or in kind; for illness and health occur in the body of an animal, but whiteness and blackness simply in a body, and justice and injustice in a soul. And necessarily all contraries are either in the same kind or in contrary kinds or else they
20 are themselves kinds; for white and black, since their kind is color, are in the same kind; but justice and injustice are in contrary kinds, the kind of the former being virtue, and that of the latter being vice; and good and bad are not in a kind, but are
25 just themselves kinds of certain things.[34]

12
Priority

There are four ways in which one thing is said to be prior to another. First, and in the strictest sense, with respect to time, according to which[35] one thing is said to be older or more ancient than another (for it is because the time is longer that it is said to be older or more ancient). Second, where there is no converse of an implication
30 of existence—for example, one is prior to two; for if there are two things, it follows immediately that there is one, whereas if there is one, there are not necessarily two. So there is no converse implication: from the existence of the one, that of the other does not follow—and the one from which there is no converse implication of existence
35 seems to be prior. Third, a thing is said to be prior with respect to some order, as with

34. *Top*. 123b9–11.
35. Reading καθ' ὃν for καθ' ὃ.

the sciences and with speeches. For in the demonstrative sciences there is a prior and a posterior in order; elements[36] are prior in order to geometrical figures, and in grammar, letters are prior to syllables. It is the same with speeches, for the introduction is **14b1**
prior in order to the narration. Moreover, in addition to the ways we have mentioned, what is better or more estimable is thought to be prior by nature. Ordinary people are in the habit of saying that those they particularly esteem and love "have priority." 5
This is pretty much the least appropriate of the ways.

There are, then, this many ways of calling something "prior." But there would seem to be another way of being prior, in addition to the ones we have mentioned; for 10
even where there is a converse implication of existence, what is somehow the cause of the other's existence might reasonably be called "prior by nature." That there are such cases is clear; for there is a converse implication of existence between the existence of a human and a true statement about him; for if there is a human, the statement in 15
which we say that there is a human is true; and the converse certainly holds; for if the statement in which we say that there is a human is true, there is a human. But the true statement is in no way the cause of there being the thing, while the thing seems somehow to be the cause of the statement's being true; for it is in virtue of whether or 20
not the thing exists that the statement is said to be true or false. So there are five ways in which one thing might be called "prior" to another.

13
Simultaneity

The things said to be simultaneous unconditionally and in the strictest sense are those that occur at the same time; for neither of them is either prior or posterior to the other. 25
These are called "simultaneous with respect to time."[37] As to the things that are simultaneous by nature, they are the ones that have a converse implication of existence, so long as neither is the cause of the other's existence—for example, double and half; for with them there is a converse implication: if there is a double there is a half, and if there is a half there is a double—and neither is the cause of the other's 30
existence.

Coordinate subdivisions within the same kind are also said to be simultaneous by nature. They are said to be "coordinately subdivided" when they are distinguished from each other in accord with the same division; for example, the flying compared to the walking, and to the aquatic. These things are coordinately subdivided from 35
the same kind; for animal is divided into these—into the flying, the walking, and

36. *Met.* 1014b3–9.

37. The Greek words for prior, posterior, and simultaneous all have a (secondary) non-temporal, as well as a (primary) temporal sense. The English words "prior" and "posterior" parallel their Greek counterparts in this respect; "simultaneous" does not, but must be read here as if it did.

the aquatic—and none of them is prior or posterior; rather, such things seem to be simultaneous by nature. Each of these—the flying, the walking, and the aquatic—
15a1 might be further divided into forms. Thus, these things too, which are marked off by the same division of the same kind, will be simultaneous by nature. But kinds are
5 always prior to forms; for they do not have a converse implication of existence—for example, if there is an aquatic animal, there is an animal; but if there is an animal, there is not necessarily an aquatic animal.

So the things said to be simultaneous by nature are all those that have a converse implication of existence, so long as neither is in any way the cause of the other's
10 existence, and coordinate subdivisions from the same kind. But things that are simultaneous unconditionally are those that occur at the same time.

14
Forms of Movement

There are six forms of movement: coming to be, passing away, increase, decrease, alteration, and change with respect to place.[38] That the remaining cases[39] of move-
15 ment are distinct from each other is evident; for coming to be is not passing away, nor is increase, nor is decrease,[40] nor is change with respect to place, and similarly for the rest. But about alteration there is a puzzle as to whether it might perhaps be necessary for what is altering to be altering in accord with one of the remaining sorts of movement.

20 However, this is not true; for with pretty much all affections, or most of them, we undergo alteration but partake of none of the other sorts of movement; for what is moved with respect to some affection does not necessarily increase or decrease, and so
25 on for the others. So alteration would be distinct from the other sorts of movement; for if it were the same, what is being altered would straightaway have to be increasing too, or decreasing, or one[41] of the other forms of movement would follow; but this is not necessarily so. Similarly, what is increasing, or being moved in some other sort of movement, would also have to be altering. But there are things that increase without
30 altering; for example, a square grows when a gnomon is put around it, but is not at all altered. Similarly too with other such cases. So the sorts of movement are distinct from each other.

15b1 Movement, simply speaking, is contrary to rest. But among particular kinds of movement, passing away is contrary to coming to be, and decrease is contrary to increase; and what seems most opposed to change with respect to place is rest
5 with respect to place, unless perhaps it is change to the contrary place (for example,

38. I.e., movements or changes with respect to substance, quantity, quality, and where.
39. I.e., those other than alteration.
40. Reading ἡ αὔξησις οὐδὲ ἡ μείωσις.
41. Reading τινι.

upward is contrary to downward, and downward to upward). But it is not easy to say what precisely is contrary to the remaining one[42] of the movements we have presented; it seems that nothing is contrary to it, unless in this case too one opposes it either to rest with respect to quality or to change to the contrary quality—in the same way that in the case of change with respect to place there is either rest with respect to place or change to the contrary place. For alteration is change with respect to quality, and so what is opposed to a change with respect to quality is either rest with respect to quality or change to the contrary quality (as, for example, coming to be white is opposed to coming to be black); for things are altered when change occurs into contrary qualities.

15
Having

Having[43] is said of things in several ways: having as a state, disposition, or some other quality (for we are said to have scientific knowledge and virtue); having as a quantity—for example, the height someone happens to have (for he is said to have a height of three cubits or four cubits); having as things on the body—for example, a cloak or a tunic; having as a thing on a part—for example, a ring on the hand; having as a part—for example, a hand or a foot; having as in a container—for example, a bushel of wheat or a jug of wine (for the jug is said to have wine, and the bushel to have wheat—they are thus said to have these as in a container); having as a possession (for we are said to have a house or a field). We are also said to have a wife, and a wife to have a husband. But the last-mentioned mode of "having" seems to be rather far-fetched; for by "he has a wife" we signify nothing other than that he lives with her in wedlock. There might perhaps turn out to be some other modes of having, but pretty much all of the ways in which it is customarily said of things have been enumerated.

42. I.e., alteration.

43. The *having* under discussion here is not, properly speaking, the category of "having on" (1ᵇ27), as is made clear by the list of ways of "having," which is cross-categorial.

DE INTERPRETATIONE*

1
Introduction

First, we must lay down what a name is and what a verb is, then what a negation, an affirmation, an assertion, and a saying are. **16ª1**

Voiced expressions are tokens for affections in the soul, and written expressions are tokens for voiced expressions. And as letters are not the same for all, neither are voiced sounds the same. But the primary items of which these expressions are signs are affections of the soul, which are the same for all, and those of which these are likenesses are objects, which are already the same. These matters have been discussed in *De Anima*;[1] for they belong to a different study.

Anyway, as in the soul there is sometimes a thought without being true or false and sometimes instead one which is such that one of the two necessarily holds of it, likewise among voiced sounds; for falsity and truth have to do with composition and division. Names and verbs by themselves are similar to the kind of thought which is without composition and division—for example, "human" or "pale" when nothing is added; for they are not yet false or true; they are, however, signs of a specific thing.[2] For even "goat-stag" does signify something, but is not yet true or false, unless "to be" or "not to be" is added, either unconditionally or with reference to time.

2
The Name

A name is a voiced sound significant by convention, not involving time, no part of which is significant in separation. For in "Whitfield," "-field" does not signify anything in its own right, as it does in the saying "white field."[3] However, the case of simple names is different from that of complex ones. For in the former the part is in

* Translated by Francesco Ademollo and Paolo Fait. Text: L. Minio-Paluello, *Categoriae et Liber De Interpretatione* (Oxford, 1956), in consultation with H. Weidemann, *De Interpretatione* (Berlin, 2014). The Greek title *Peri hermêneias*—probably not Aristotelian—means *On Linguistic Expression*. But Boethius' questionable translation of *hermêneia* as *interpretatio* ("interpretation") has become canonical.

1. The reference may be to *DA* 3.4–5, 7–8 (on understanding receiving the intelligible form of its object) or to 3.6 (on simple and compound thoughts).

2. Reading ἀληθές πω, σημεῖον with Weidemann.

3. Aristotle's example is *Kallippos*, a proper name derived from a contraction of the phrase *kalos hippos*, "noble horse."

no way significant, whereas in the latter it has a meaning, but not in separation from anything—for example, "plum-" in "plumcot."[4]

"By convention" means that no name is such by nature, but only when it becomes a token. For also unlettered sounds, for example, those of beasts, do indicate something—and yet none of them is a name.

"Not-human" is not a name. There is, however, no name established by which one should call it; for it is neither a saying nor a negation. Let us call it an "indefinite name."

Philônos ("Philo's"), *Philôni* ("to Philo"), and the like are not names but inflections of a name. The account of this variety goes in the same way in the other respects, except that when combined with "is," "was," or "will be" it is not true or false (whereas the name always is). For example, "Philo's is" or ". . . is not": here there is not yet anything true or false.

3
The Verb

A verb is what additionally signifies time, no part of which is significant separately; and it is always[5] a sign of the things said of something other. I say that it additionally signifies time—for example, "recovery" is a name, but "recovers" is a verb, because it additionally signifies the thing's holding now. And it is always a sign of the things which are said of something other, that is, are said of a subject or in a subject.[6]

"Doesn't-recover" and "doesn't-ail" I do not call verbs. For although they additionally signify time, and always hold of something, there is no established name for their difference.[7] Let us call them "indefinite verbs," because they hold in the same way of any sort of thing: both of something that is and of something that is not.

Likewise, "recovered" and "will recover" are not verbs, but inflections of a verb. They differ from the verb because the verb additionally signifies the present time, whereas inflections additionally signify the time outside the present.

When uttered just by themselves verbs are names and signify something—for the speaker arrests the thought and the hearer pauses—but they do not yet signify whether it is or is not. For not even[8] "to be" or "not to be" is a sign of the thing—not even if

4. Aristotle's example is *epaktrokelês*: a hybrid kind of ship, partly similar to a kind of ship called *epaktris*, partly similar to a different kind called *kelês*. Likewise, a plumcot is a hybrid between a plum and an apricot.

5. Reading ἔστιν ἀεὶ with Weidemann.

6. Reading καὶ ἀεὶ τῶν καθ' ἑτέρου λεγομένων σημεῖόν ἐστιν, οἷον τῶν καθ' ὑποκειμένου ἢ ἐν ὑποκειμένῳ. See *Cat.*1a20–b6.

7. I.e., we lack a term to identify this as a specific kind of verb.

8. Reading οὐδὲ.

you say "what is" just by itself alone.[9] For by itself it is nothing, but it additionally signifies some composition, which cannot be thought of without the components.

4
The Saying

A saying is a significant voiced sound, some part of which is significant in separation—as a phrase but not as an affirmation. I mean, for example, that "human" signifies something, though not that it is or is not (there will instead be an affirmation or negation if something is added), but not a single syllable of "human." For even in "mice," "ice"[10] is not significant but is, in that context, a mere voiced sound. (In double names, instead, the part signifies, but not by itself, as was said.[11])

Every saying is significant—not, however, as an instrument, but by convention, as was said.[12] However, not every saying is assertoric, but only that in which being **17ª1** true or being false holds. And they do not hold in all sayings—for example, a prayer is a saying, but is neither true nor false. Let us leave aside the others, then, for their examination is more appropriate to rhetoric or poetry. The assertoric one, by contrast, belongs to the present theoretical investigation.

5
Assertoric Sayings: One and Many, Simple and Compound

The first assertoric saying that is a single one is the affirmation, then the negation; the others are one in virtue of a connective. Necessarily, every assertoric saying contains a verb or an inflection [of a verb]. For even the definitional saying of human, unless "is" or "will be" or "was" or some such thing is added, is not yet an assertoric saying. (Explaining why "terrestrial two-footed animal" is one and not many—for it will not be one just in virtue of being spoken together—is a matter for another inquiry.)[13]

An assertoric saying is a single one if it either indicates one thing or is one in virtue of a connective; many are either those which indicate many things and not one or those without a connective. (Let us consider the name and the verb as just a phrase, because it is not possible to say it, indicating something with one's voiced sound, in such a way as to make an assertion, whether in response to a question raised by someone or rather of one's own deliberate choice.)

9. Reading αὐτὸ καθ' αὑτὸ ψιλόν with Weidemann.
10. Aristotle's example is *mus* ("mouse") and *us* ("pig").
11. 16^a21–22.
12. 16^a19, 25–29.
13. *Met.* 7.12, 8.6.

Of these, one is a simple assertion, that is, something about something or something away from something, whereas the other is composed of these, that is, a saying which is already composite. The simple assertion is a significant voiced sound about whether something holds or does not hold, according to the divisions of time.

6
Affirmation, Negation, and Contradiction

An affirmation is an assertion of something about something; a negation is an assertion of something away from something. And since it is possible to assert of what holds that it does not hold, of what does not hold that it holds, of what holds that it holds, and of what does not hold that it does not hold (and similarly for the times outside the present), it must be possible to deny anything one has affirmed and to affirm anything one has denied. So it is clear that any affirmation has an opposite negation and any negation has an opposite affirmation. And let a contradictory pair be this: an affirmation and a negation opposite to each other. By "opposite" I mean that of the same thing about the same thing, but not homonymously, and all the other specifications of this sort which we add against the annoying objections of the sophists.

7
Universal and Particular Things; Universal, Non-universal, and Particular Assertions

Since among things some are universal, others are particular (I call "universal" what is of a nature to be predicated of a plurality of things, "particular" what is not—for example, human is a universal, Callias a particular), it is necessary to assert that something holds or does not hold either of some universal or of some particular. So, if one asserts universally about a universal that something holds or does not hold, there will be contrary assertions (by "asserting universally about a universal" I mean, for example, "Every human is pale" or "No human is pale"). When, on the other hand, one makes an assertion about universals, but not universally, the assertions are not contrary, but the things indicated may be contrary (by "making an assertion about universals not universally" I mean, for example, "A human is pale," "A human is not pale": "human" is universal, but one does not treat the assertion as universal; for "every" does not signify a universal, but that something holds, or does not hold, universally).

To predicate a universal universally about a subject of predication is not true. For there will be no affirmation in which a universal is predicated universally of the subject of a predication—for example, "Every human is every animal."[14]

14. I.e., the universal quantifier "every" should not be attached to the *predicate* term.

I say that an affirmation is contradictorily opposed to a negation when one signifies of a universal that something holds, or does not hold, of it universally, while the other signifies of the same universal that something holds, or does not hold, of it not universally[15]—for example, "Every human is pale," "Not every human is pale," "No human is pale," "Some human is pale." Contrarily opposed to each other are the universal affirmation and the universal negation[16]—for example, "Every human is just," "No human is just." These, therefore, cannot be true at the same time, whereas those opposed to them may be true [at the same time] about the same thing—for example, "Not every human is pale" and "Some human is pale."

Of all contradictory pairs concerning universals spoken of universally, then, necessarily one member is true and the other false. The same goes for those contradictory pairs that are about particulars—for example, "Socrates is pale," "Socrates is not pale." However, in the case of those contradictory pairs which are about universals not spoken of universally, it is not always the case that one is true and the other is false. For it is true at the same time to say "A human is pale" and "A human is not pale," and "A human is beautiful" and "A human is not beautiful."[17] (For if it is ugly, then it is also not beautiful; and if it is becoming something, then it also is not that thing.) This might seem absurd at first glance, because "A human is not pale" appears to signify also, at the same time, that no human is pale. But it does not signify the same, nor does it necessarily hold at the same time.

Clearly, one single affirmation has one single negation: for the negation must deny the same thing as the affirmation affirmed, and away from the same thing, whether this is particular or universal, and whether universally or not universally; I mean, for example, "Socrates is pale," "Socrates is not pale." If one instead denies something other, or the same thing away from something other, it will not be the opposite assertion, but a distinct one. The opposite of "Every human is pale" is "Not every human is pale," that of "Some human is pale" is "No human is pale," and that of "A human is pale" is "A human is not pale."

We have said, then, that one single affirmation is contradictorily opposed to one single negation, and what these are, and that contraries are distinct, and what these are, and also that not every contradictory pair has one true and one false member, why this is, and when it is has one true and one false member.

15. Reading τὴν τὸ καθόλου <ὅτι καθόλου> σημαίνουσαν <τῇ> τὸ αὐτὸ ὅτι οὐ καθόλου with Weidemann.

16. Reading τὴν καθόλου κατάφασιν καὶ τὴν καθόλου ἀπόφασιν.

17. These sentences are "indeterminate" (*APr.* 24^a19–20) and so can be used as equivalent either to particular or to universal sentences.

8
The Unity of Affirmations and Negations

A single affirmation and negation is one that signifies one thing of one thing, either a universal taken universally or not universally. For example, "Every human is pale" / "Not every human is pale"; "A human is pale" / "A human is not pale"; "No human is pale" / "Some human is pale," if "pale" signifies one thing. But if a name is given to two things from which no unity is formed, there is not a single affirmation nor a single negation.[18] For example, if someone were to give the name "cloak" to a horse and a human, "A cloak is pale" would not be a single affirmation. Saying this would not differ at all from saying "A human and a horse is pale" and this does not differ at all from saying "A horse is pale" and "A human is pale." If, then, these affirmations signify many things and are many, it is clear that also the first one signifies either many things or nothing. For no human is a horse. As a consequence, not even in these is it necessary that one part of the contradictory pair is true and the other false.

9
Assertions about Future Particular Events

With regard to things that are or have come to be, necessarily the affirmation or the negation about them is true or false. And as regards universals spoken of universally, necessarily it is always the case that one assertion about them is true and the other false, and as regards particulars too, as we have said,[19] while as regards universals spoken of not universally it is not necessarily so; we have discussed these too.[20]

However, with regard to particulars that are going to be, matters are not the same. For if every affirmation or negation is true or false, then it is also necessary for everything to hold or not to hold. So, if[21] someone will say that something will be and someone else will say of this same thing that it will not be, clearly it is necessary for one or the other of them to be speaking truly—if every affirmation is true or false. For both will not hold at the same time in such cases. For if it is true to say that it is pale, or that[22] it is not pale, then necessarily it is pale, or not pale, and if it is pale, or not pale, then it is true, as we have just said, to affirm or deny it; and if it does not hold, one is speaking falsely, and if one is speaking falsely, it does not hold. So, necessarily, either the affirmation or the negation is true. Therefore, nothing is or comes to be, nor will be or not be, by luck, or in whichever of the two ways it happens to, but everything of necessity and not in whichever of the two ways it happens to. For either

18. Reading οὐδὲ ἀπόφασις μία with Weidemann.
19. 17b27–29.
20. 17b29–34.
21. Reading ὥστε εἰ with Weidemann.
22. Reading ἢ ὅτι with Weidemann.

the one who affirms or the one who denies is speaking truly. For otherwise things might equally well come to be or not come to be; for what is in whichever of the two ways it happens to, is, or will be, no more so than not so.

Further, if something is pale now, it was true to say beforehand that it would be pale; so it was always true to say of whatever of the things which have come to be that it would be. And if it was always true to say that it was or would be, it is not possible for this not to be, or not to be going to be. But if something is such that it is not possible for it not to come to be, it is impossible for it not to come to be; and if it is impossible for something not to come to be, it is necessary for it to come to be. For all things that will be, then, it is necessary to come to be. Therefore, nothing will be in whichever of the two ways it happens to be or by luck; for if by luck, then not of necessity.

However, it is also not possible to say that neither of the two is true, that it will neither be nor not be. For, first, in such a situation, while the affirmation is false, the negation is not true, and while the latter is false, the affirmation turns out not to be true. In addition, if it is true to say that it is pale and large,[23] then both must hold, and if it is true to say that they will hold tomorrow, then they will have to hold[24] tomorrow. But if tomorrow it will neither be nor not be, then this would not be a case of things being in whichever of the two ways it happens to be. Take, for example, a sea battle: the sea battle would have neither to come to be nor not to come to be.

These, then, and other things of this sort, are the absurdities which result if, in every pair consisting of an affirmation and a negation that are opposite to each other, whether about universals spoken of universally or about particulars, necessarily one is true and the other is false: among the things which come to be, nothing is in whichever of the two ways it happens to be, but everything is and comes to be of necessity; as a consequence, there would be no need to deliberate or worry that, if we do this, this will be, but if we do not do this, it will not be. For nothing prevents someone from affirming that this will be in ten thousand years and someone else from denying it; so, whichever of the two was true to say then, will be of necessity. In fact, this makes no difference either, whether or not any people actually say the two contradictories; for clearly this is how things are even if it is not the case that someone affirms and another denies. For it is not because someone affirms or denies that it will be or not be, nor in ten thousand years rather than after a period of time of any length whatsoever. So, if during any interval of time[25] the state of things was such that one or the other was true, then it was necessary for this to come to be, and each of the things that come to be was[26] always in such a state as to come to be of necessity. For if someone said truly of something that it would be, it is not possible for this not to come to be; and of what comes to be it was always true to say that it would be.

23. Reading μέγα with Weidemann.
24. Reading ὑπάρξειν with Weidemann.
25. Reading ἐν ἅπαντι χρόνῳ with Weidemann.
26. Reading εἶχεν with Weidemann.

These things, then, are impossible. For we see that the starting-point of the things that will be is from both deliberation and action, and that, in general, in the things which are not always in activity there is the possibility of being and not being, and that in them both being and not being are admissible, and so also are coming to be and not coming to be—and in many cases it is clear to us that things are in this way: for example, it is possible for this cloak to be cut up, and yet it will not be cut up, but will wear out beforehand; and it is also equally possible for it not to be cut up, for wearing out beforehand would not hold of it, if it were not possible for it not to be cut up; so the same goes also for all the other comings to be spoken of in accord with this sort of possibility—it is evident, therefore, that not everything is or comes to be of necessity; rather, in some cases things are in whichever of the two ways they happen to be and neither the affirmation nor the negation is more true, whereas in other cases one of them is more true and one alternative comes to be for the most part, but, nonetheless, it is admissible also for the other and not the former to come to be.

What is necessarily is, when it is, and what is not necessarily is not, when it is not. Nonetheless, it is not the case that everything that is, necessarily is, or that everything that is not, necessarily is not. For it is not the same for everything that is to be of necessity when it is and to be unconditionally of necessity; and similarly with what is not. The same account applies to a contradictory pair. Everything necessarily is or is not, and will be or will not be; nonetheless, if one divides and says one or the other member of the pair, it is not the case that that is necessary.[27] I mean that, for example, necessarily there will be a sea battle tomorrow or there will not be one, and yet it is not necessary for a sea battle to come to be tomorrow, nor for it not to come to be; it is, however, necessary for it either to come to be or not to come to be.

So, since sayings are true in the same way as things, clearly whenever things are in such a condition that they are in whichever of the two ways it happens to be and contraries are admissible, the contradictory pair is necessarily in the same condition. This is precisely what happens in the case of the things that not always are or not always are not; for concerning these necessarily one or the other member of a contradictory pair is true or false—not, however, this or that, but whichever of the two it happens to be—and one of the two is more true than the other, but not thereby true or false. So it is clear that it is not necessary that, in every pair consisting of an affirmation and a negation opposite to each other, one should be true and the other false. For the case of the things that are is not like that of the things that are not, but are such that it is possible for them to be or not to be; the case of the latter is rather as we have said.

27. Cf. *SE* 166a23–32.

10
Affirmations and Negations with Indefinite Names and Verbs

Since an affirmation signifies something about something, and the latter is either a name or a "not-name," and what is in an affirmation must be one thing and about one thing (what a name is, and what the not-name, was stated previously;[28] for I do not call "not-human" a name, but an indefinite name—since it somehow signifies one indefinite thing—just as I do not call "does not recover" a verb[29]), every affirmation will be composed either of a name and a verb or of an indefinite name and a verb. Without a verb there is no affirmation or negation, for "is," "will be," "was," "comes to be," and the like are all verbs according to what we have laid down,[30] for they additionally signify time. So the first affirmation and negation are: "A human is" / "A human is not"; then "A not-human is" / "A not-human is not." Again, "Every human is" / "Every human is not"; "Every not-human is" / "Every not-human is not." The same holds for the times outside the present.

When "is" is predicated in addition as a third element, the oppositions are expressed in two ways.[31] I mean, for example, "A human is just": I say that "is" enters the composition as third name or verb[32] in the affirmation. So because of this there will be four cases, two of which will be, with regard to the sequence of affirmation and negation, in the way privations are, while two will not.[33] I mean that "is" will be added either to "just" or to "not-just," and so too will the negation. They will thus be four. Let us understand what has been said on the basis of the diagram below:

[A] A human is just	[B] Negation[34] A human is not just
[D] Negation[35] A human is not not-just	[C] A human is not-just

28. $16^a29–32$.
29. $16^b11–14$.
30. $16^b6–10$. At $16^b16–19$ verbs in tenses other than the present were described as "not verbs, but inflections of a verb."
31. I.e., depending on whether the negation is formed by adding the negation to "is" ("is-not just") or to the complement ("is not-just").
32. Aristotle's point seems to be that "is" is a third element in the set of names and verbs forming the affirmation.
33. Aristotle mentions privations (e.g., "unjust," "unequal") not because they are relevant here, but because, in the square diagram he uses as a model, affirmation and negation of a privative term appear in inverted order under affirmation and negation of the corresponding positive term.
34. I.e., of A.
35. I.e., of C.

In these cases "is" and "is not" are added to "just" and "not-just." As explained in the *Analytics*,[36] these cases are arranged in this way. Likewise too, if the affirmation is about the name taken universally—for example,

[A]	[B]
Every human is just	Not every human is just
[D]	[C]
Not every human is not-just	Every human is not-just

Here, however, the assertions on the diagonal cannot, in the same way, be true together, though they sometimes can.[37]

These, then, are two pairs in opposition. There are other oppositions if the addition is made to "not-human" as a sort of subject:

[A]	[B]
A not-human is just	A not-human is not just
[D]	[C]
A not-human is not not-just	A not-human is not-just

20^a1 There will not be any more oppositions than these, and these latter are a case of their own, separate from the previous ones, since they employ "not-human" as a name.

In all those cases where "is" does not fit (for example, with "to recover" or "to walk") the verbs produce the same result when they are placed in the same way as if "is" were added—for example: "Every human recovers" / "Every human does not recover."[38] "Every not-human recovers" / "Every not-human does not recover." For[39] one must not say "not-every-human" but add "not"—the negation—to "human." For "every"

36. At *APr*. 51^b36–52^a17 (cf. *Cael.* 282^b25–283^a1), Aristotle describes a square diagram with schematic term-letters arranged in chiastic order:

Affirmation (A)	Negation (B)
Negation (D)	Affirmation (C)

The purpose of the inversion was probably to achieve a perspicuous representation of certain logical relations in the diagram. The translation displays this and the following diagrams in that order, with the lettering of *APr*. added in square brackets.

37. A and C are mutually incompatible, while B and D are compatible. This differs from the previous diagram where both pairs are trivially compatible because their subject ("a human") is not taken universally.

38. This is the contrary, not the contradictory negation that we would expect in analogy with the quartets that precede, but Aristotle is referring back to 19^b17, and there too he phrases the negation of "Every human is" as the contrary ("Every human is not") rather than the contradictory ("Not every human is"). Although the reason is not clear, it is worth noting that here, at 19^b17, and at 20^a10–11 Aristotle is not displaying the oppositions as a square diagram.

39. I.e., in cases C and D.

does not signify the universal but that it is taken universally. This is clear from the following: "A human recovers"/ "A human does not recover." "A not-human recovers" / "A not-human does not recover." These cases differ from the previous ones in not being universal; thus "every" or "no" adds nothing to the signification other than that one affirms or denies universally about the name; hence the other elements must be added in the same way.[40]

Since the assertion signifying that no animal is just is the contrary negation of "Every animal is just," it is clear that these will never be true at the same time nor about the same thing, but their opposites[41]—"Not every animal is just" and "Some animal is just"—sometimes will. There are these consequences: "No human is just" follows from "Every human is not-just"; while the opposite of the latter, that not every human is not-just, follows from "Some human is just" (for there must be one).

It is also clear that, regarding particulars, if it is true to answer a question in the negative, it is also true to affirm—for example, "Is Socrates wise?" "No." "Therefore, Socrates is not-wise." Regarding universals, on the other hand, the affirmation phrased like the last one is not true, but the negation is true—for example, "Is every human wise?" "No." "Therefore, every human is not-wise." For this is false, while "Therefore, not every human is wise" is true. This is the opposite, whereas the other is the contrary.

Those opposite expressions that consist in indefinite names and verbs, such as "not-human" and "not-just," may seem to be negations without a name and a verb. But they are not. For a negation must always be true or false, while unless something else is added, someone who says "not-human" has no more said something true or false than someone who says "human"—indeed rather less so.

"Every not-human is just" does not signify the same as any of the above, nor does its opposite, "Not every not-human is just." "Every not-human is not-just" instead signifies the same as "No not-human is just."[42]

When names and verbs are transposed, they signify the same—for example, "A human is pale," "Pale is a human."[43] For if this is not the case, there will be more negations of the same affirmation; but it has been shown[44] that there is one negation of one affirmation. For the negation of "A human is pale" is "A human is not pale." The negation of "Pale is a human," if this is not the same as "A human is pale," will be either "Pale is not a not-human" or "Pale is not a human." But the former is the negation of "Pale is a not-human," the latter of "A human is pale." So they will be

40. I.e., by placing the negation sign "not" immediately before the subject noun of C and D.
41. I.e., the contradictory opposites.
42. Aristotle may be indicating that with negated subjects ("not-human"), there are no inferences like those mentioned at $20^{a}20$–23.
43. The transposition of "pale" and "a human" does not affect their syntactic roles. In either case "A human" is meant as the subject and "is pale" as the predicate.
44. $17^{b}37$–$18^{a}7$.

two negations of one affirmation. It is clear, then, that if the name and the verb are transposed, the same affirmation and negation result.

11
Single and Multiple Affirmations and Negations

Affirming or denying one thing about many, or many things about one, is not one affirmation or negation, unless what the many constitute is some one thing. And I do not call it "one" if there is one name established but they fail to constitute one thing.[45] For example, human is perhaps animal, and two-footed, and tame, but these items also constitute one thing, whereas pale, and human, and walking do not constitute one thing. So if someone affirms some one thing about these, it is not one affirmation: it is one voiced sound, but several affirmations. Likewise, if these are affirmed about one thing, this is several affirmations too. If, then, a dialectical question[46] is the request for an answer that is either the proposition at stake or one member of a contradictory pair (and if the proposition is a member of one contradictory pair), there will be no one answer in these cases (for the question is not one either), not even if it is true.[47] This is discussed in the *Topics*.[48] At the same time it is clear that the question "What is it?" is not dialectical either. For the question must give one the choice of asserting whichever member of the contradictory pair one wishes. The questioner must specify in addition whether human is this or not this.

Since of things predicated separately, some are also predicated in combination, the whole predicate being as one, while others are not, what is the difference? For of human it is true to say "animal" separately, and "two-footed" separately, and also to say them as one. Likewise, "human" and "pale," and these too as one. But it is not the case that if someone is good and a cobbler, he is also a good cobbler. For, if it is assumed that, because something is each of two things, it is also what is formed by both together, many absurdities will follow. For since of a human both "human" and "pale" are true, so also is the compound; again, if "pale," then also the compound. So he will be a pale pale human, and so on without limit. And again a musical pale walking one, and then these compounded many times over. In addition, if Socrates is Socrates and is a human, he is also Socrates human, and if he is a human and two-footed, he is a two-footed human.

It is clear, then, that if one unconditionally sets down that compounds come about, one ends up making many absurd claims. Let us now state how the matter must be set down.

45. Cf. $18^{a}18$–26.
46. *Top.* 1.10–11.
47. I.e., even if a question that lumps together several questions can be truly answered by a cumulative yes (or a cumulative no), still it is not a *single* answer.
48. *SE* (here referred to as part of *Top*.) $169^{a}7$–18, $175^{b}39$–$176^{a}18$, $181^{a}36$–$^{b}24$.

Among things predicated and things over which they happen to be predicated, those that are said coincidentally either about the same thing or about each other will not be one thing. For example, a human is pale and musical, but pale and musical together are not one thing, because they are both coincidents of the same thing. And even if it is true to say "pale musical," still the musical pale will not be one thing. For the musical is pale coincidentally, so the pale musical will not be one thing.[49] Nor, as a consequence, will a cobbler[50] who is unconditionally good be one thing, but an animal that is two-footed will be, for this is not coincidental. Further, all those things of which one is contained in the other will not be one thing either. That is why neither will the pale be predicated many times over nor will a human be an animal human or a two-footed human. For two-footed and animal are contained in human.

It is true to speak of the particular thing also unconditionally—for example, to call the particular human "human" and the particular pale human "pale." Not always, though. Rather, when in what is added there is contained an opposite from which a contradiction follows, it is not true but false—for example, to call a dead human "human." But when it is not contained, it is true. Or rather, when it is contained, it is always not true, while when it is not contained, it is not always true. As in this case: Homer is something, namely, a poet. Does it follow that he also is, or not? No, for "is" is predicated coincidentally of Homer. Indeed, it is because he is a poet, and not intrinsically, that "is" is predicated about Homer. So in those predications in which both no contrariety is contained when accounts are stated in place of names and the predicates are predicated intrinsically and not coincidentally, it will be true to speak of a particular case also unconditionally. It is not true that, because it is an object of belief, what is not is something that is; for the belief about it is not that it is, but that it is not.

12
Modal Affirmations and Negations

Having made these distinctions, we must investigate the mutual relations of negations and affirmations of the possible to be and the not possible, the admissible and the not admissible, and about the impossible and the necessary. For they raise certain puzzles.

For suppose we say that among composite expressions the contradictories opposed to each other are those that are ordered according to "to be" and "not to be." For example, the negation of "to be a human" is "not to be a human," not "to be a not-human"; also, the negation of "to be a pale human" is "not to be a pale human," not "to be a not-pale human" (for in that case, if either the affirmation or the negation **21b1**

49. Reading μουσικὸν ἔν τι with Weidemann.
50. Reading οὐδὲ.

applies to everything, it would be true to say that the log is a not-pale human). And if that is so, in cases in which "to be" is not added, what is said instead of "to be" will play the same role—for example, the negation of "A human walks" will not be "A not-human walks," but "A human does not walk"; for to say "A human walks" does not differ at all from saying "A human is walking." So, if this is the case everywhere, the negation of "possible to be" is "possible not to be," and not "not possible to be." Yet it seems that it is possible for the same thing both to be and not to be, because if it is possible for anything to be cut or to walk, it is also possible for it not to walk and not to be cut. The reason is that all that is possible in this way is not always actual, so the negation too will hold of it; for it is possible for what is able to walk not to walk and for what is visible not to be seen. But it is impossible for opposite phrases to be true about the same thing. Therefore, this is not the negation. For from these assumptions it follows that either it is possible to affirm and deny the same thing about the same thing at the same time, or that affirmations and negations do not come about in virtue of "to be" and "not to be" being the additional components. If, then, the former is impossible, the latter must be chosen.

The negation of "possible to be," therefore, is "not possible to be." The same account holds also for "admissible to be," for the negation of this is "not admissible to be." Likewise also in the other cases, that is, "necessary" and "impossible." For, as in the previous examples, "to be" and "not to be" are additions, while the underlying objects are pale and human, so in these cases "to be" takes the role of an underlying thing, while "to be possible" and "to be admissible" are additions, and just as "to be" and "not to be" determine the truth with regard to those underlying things, these do so with regard to being possible and being not possible.[51]

The negation of "possible not to be" is "not possible not to be." That is precisely why "possible to be" and "possible not to be" might seem to follow from each other. For it is possible for the same thing to be and not to be; for such assertions are not contradictories of each other. But "possible to be" and "not possible to be" never **22a1** hold together. For they are opposites. Nor, indeed, do "possible not to be" and "not possible not to be" ever hold together. Similarly, the negation of "necessary to be" is not "necessary not to be," but "not necessary to be"; and the negation of "necessary not to be" is "not necessary not to be." And of "impossible to be" the negation is not "impossible not to be" but "not impossible to be"; and of "impossible not to be," "not impossible not to be." And universally, as was said,[52] one must treat "to be" and "not to be" as the underlying things, and these others must be joined on to "to be" and "not to be" to make an affirmation and a negation. We must take the opposite expressions to be these: "possible" / "not possible"; "admissible" / "not admissible"; "impossible" / "not impossible"; "necessary" / "not necessary"; "true" / "not true."

51. I.e., as "is" transforms "human" and "pale" into something truth-evaluable, so "it is possible" transforms "for a human to be pale" into something truth-evaluable.
52. 21b26–32.

13
The Table of the Possible, the Admissible, the Impossible, and the Necessary

Having laid down these foundations, implications too follow along in accord with reason. From "possible to be" there follow "admissible to be" (and, conversely, the former from the latter), and "not impossible to be" and "not necessary to be." From "possible not to be" (and "admissible not to be") there follow both "not necessary not to be" and "not impossible not to be." From "not possible to be" (and "not admissible to be") there follow "necessary not to be" and "impossible to be." From "not possible not to be" (and "not admissible not to be") there follow "necessary to be" and "impossible not to be." What we say can be seen from the following table:

1	2
possible to be	not possible to be
admissible to be	not admissible to be
not impossible to be	impossible to be
not necessary to be	necessary not to be

3	4
possible not to be	not possible not to be
admissible not to be	not admissible not to be
not impossible not to be	impossible not to be
not necessary not to be	necessary to be

"Impossible" and "not impossible" follow from "admissible" and "possible" and "not admissible" and "not possible" contradictorily but conversely.[53] For the negation of "impossible" follows from "possible to be," and the affirmation from the negation; for "impossible to be" follows from "not possible to be"; for "impossible to be" is an affirmation, "not impossible" a negation.[54]

53. From the contradictory pair "possible" and "not possible" there follow "impossible" and "not impossible" as a contradictory pair ("contradictorily"), but in inverted order ("conversely"). The negative "not impossible" follows from the affirmative "possible," and the affirmative "impossible" from the negative "not possible."

54. This and the following paragraph provide a commentary on the four forms of "impossible" and of "necessary" explaining why they are arranged as they are on the table. Aristotle then raises a problem which leads to an emendation of the table.

Let us observe how it is with "necessary." Clearly not in the same way: here contraries follow[55] and contradictories are separated;[56] for "not necessary to be" is not the
22b1 negation of "necessary not to be"; for both can be true of the same thing; for what is necessary not to be is not necessary to be. The cause of their not following like the others is that, when it is equivalent to it, the impossible corresponds to the necessary
5 in a contrary way.[57] For if it is impossible to be, it is necessary for this (not, to be, but) not to be. And if it is impossible not to be, it is necessary for this to be. So if those follow from "possible" and "not possible" in the same way, these[58] follow in a contrary way, since "necessary" and "impossible" do signify the same, but, as we said, they do so conversely.

Yet perhaps it is impossible for the contradictions pertaining to the necessary to
10 be arranged in this way. For what is necessary to be is possible to be. (For otherwise the negation will follow. For it is necessary either to affirm or to deny. So if it is not possible to be, it is impossible to be. The necessary to be is thus impossible to be—which is absurd.) But[59] from "possible to be" there follows "not impossible to be"
15 and from this there follows "not necessary to be." So it follows that the necessary to be is not necessary to be—which is absurd. But again, neither "necessary to be" nor "necessary not to be" follow from "possible to be." For with the latter both outcomes can happen, but whichever of the former[60] is true, these[61] will no longer be true; for
20 it is at the same time possible to be and not to be, but if it is necessary to be or not to be, it will not be possible for both.

It remains, then, that from "possible to be" there follows "not necessary not to be," for this is also true of what is necessary to be. For this also proves to be contradictory to what follows from "not possible to be"; for it is from the latter that "impossible
25 to be" and "necessary not to be" follow, whose negation is "not necessary not to be."

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55. According to one way of explaining this cryptic remark, in the exceptional case of necessity (last line), what follows in each quadrant is not the contradictory of what follows in the adjacent quadrant. Rather, it is the contrary of the contradictory of what correspondingly follows in the adjacent quadrant. Consider quadrant 1: the contradictory of "not necessary to be" is "necessary to be," yet what follows in quadrant 2 is the latter's contrary: "necessary not to be." It is the same in quadrants 3 and 4. However, the relation between this fact and the account that follows in the text (22b3–10) is not completely clear.

56. I.e., the expressions containing "necessary" differ from the others in not flanking their contradictory.

57. I.e., a sentence of the form "It is impossible that P" can be translated into an equivalent sentence of the form "It is necessary that not-P," and a sentence of the form "It is impossible that not-P" can be translated into an equivalent sentence of the form "It is necessary that P."

58. I.e., perhaps, all the expressions containing "necessary" (fourth lines of all quadrants). However, the examples Aristotle has just given only apply to quadrants 2 and 4. In any case, "those" refers to all the expressions containing "impossible."

59. On the basis of the table.

60. I.e., "necessary to be" and "necessary not to be."

61. I.e., "possible to be" and "possible not to be."

So these contradictories too follow in the way stated, and nothing impossible results when we put things in this way.

One might raise a puzzle as to whether "possible to be" follows from "necessary to be." For if it does not follow, its contradictory, "not possible to be," will follow. And if one were reluctant to call this "the contradictory," one would have to say that "possible not to be" is—and both are false of what is necessary to be. But then again the same thing seems capable[62] of being cut and of not being cut, of being and of not being, and, hence, what is necessary to be will be admissible not to be—but this is false. It is evident, then, that not everything capable either of being or of walking is also capable of the opposite: there are cases in which this is not true. First, with things that are capable not in accord with reason; fire, for example, is able to heat and has a non-rational capacity. So, while rational capacities[63] are the same capacities for more than one thing and for contraries, not all non-rational capacities are this way. Rather, as was said, fire is not capable of heating and of not heating, nor are all the other things that are always in activity. On the other hand, even some of the things with non-rational capacities are at the same time capable of opposites.[64] But the purpose of the point we have made is that not every capacity is for opposites—not even all those that are said to be capacities in accord with the same form. In addition, some capacities are homonymous; for things are not said to be capable in only one way. Instead, one is said to be so because it is true insofar as it is activated—for example, it is capable of walking because it is walking, and in general capable of being because it is already actively what it is said to be capable of. Another is said to be so because it might be activated—for example, capable of walking because it might walk. And this latter capacity occurs only in movable things; the former also in immovable ones. Of both it is true to say that it is not impossible to walk or to be—both of what is already walking and activated and what is able to walk. And while it is not true to attribute the second kind of capable to what is unconditionally necessary, it is true to attribute the other. So, since the universal follows from the particular,[65] "capable of being"—though not every sort of capable—follows from "being of necessity." Perhaps, indeed, the necessary and the not necessary are the starting point of everything's either being or not being, and one should investigate the others as following from these.

30 35 **23^{a}1** 5 10 15 20

It is clear from what has been said that what is of necessity *is* actively; so, if the things that always *are* are prior, then also activity is prior to capacity. Some things are activities without capacity (such as the primary substances), others with capacity (and these are prior in nature but posterior in time), and others are never activities but capacities only.[66]

25

62. "Capable" is used to translate *dunaton* (previously "possible") from here to the end of the chapter.
63. *Met.* 9.2, 9.5.
64. I.e., passive non-rational capacities: wood can be burned or not.
65. I.e., the more generic term follows from the more specific.
66. I.e., things like the unlimited. See *Ph.* 3.6.

14
Contrary Beliefs and Sayings[67]

Is the affirmation contrary to the negation or the affirmation to the affirmation? Is the saying that every human is just contrary to the saying "No human is just," or "Every human is just" to "Every human is unjust"? For example, "Callias is just" / "Callias is not just" / "Callias is unjust." Which of these is contrary?[68] For if voiced expressions follow things in the mind, and there the contrary belief is that of the contrary (for example, the belief that every human is just is contrary to the belief that every human is unjust), the same must also hold for voiced affirmations. If, however, it is not the case there that the belief of the contrary is contrary, neither will the affirmation be contrary to the affirmation, but rather the aforesaid negation. So we must inquire which false belief is contrary to a true belief,[69] whether the belief of the negation or the one to the effect that the contrary is the case.

I mean this: There is a true belief about the good, that it is good. Another, a false one, that it is not good, and yet another, that it is bad. Which of these two is contrary to the true one? And if they are one single belief, in accord with which of the two is it contrary? (It is false to think that contrary beliefs are defined by being of the contraries. The belief about the good, that it is good, and the belief about the bad, that it is bad, are perhaps the same, and true, whether they are one belief or more than one; yet these are contrary things. But beliefs are not contraries because they are about contraries, but rather because they are to the contrary effect.)

If, about the good, there is the belief that it is good, the belief that it is not good, and the belief that it is something else which does not and cannot hold (we must not consider as contraries any other beliefs—neither those to the effect that what does not hold holds, nor those to the effect that what holds does not hold; for there is an indefinite number of both kinds, both of those to the effect that what does not hold holds and of those to the effect that what holds does not hold—but only those in which there is deception; and this[70] is from the things from which there are generations; for generations are from opposites, so deceptions are from them too)—if, then, the good is both good and not bad, and it is the former intrinsically and the latter coincidentally (for it is coincidental to it to be not bad), but, about anything, the belief about what it is intrinsically is more true—and this holds also for the false, if indeed it holds for the true. The belief that the good is not good, then, is false of what holds intrinsically, while the belief that it is bad is false of what holds coincidentally; so the belief of the negation will be more false of the good than the

67. Several ancient and modern commentators regard this chapter as inconsistent with the distinction between contraries and contradictories advanced in Chapter 7 and have therefore doubted its authenticity.

68. I.e., which of the last two is contrary to the first?

69. Reading ψευδὴς ἀληθεῖ with Weidemann.

70. Reading αὕτη with Weidemann.

belief of the contrary. But it is the person who holds the contrary belief who is most deceived with regard to anything; for contraries are among the things that differ most with regard to the same thing. If, then, one of the two is the contrary, and the belief of the contradictory is more contrary, clearly this must be the contrary. Also, the belief that the good is bad is complex, for the same person must perhaps assume also that the good is not good.

Further, if things must be the same way also in other cases, it would seem that our account of this one has been correct too. For the belief of the contradictory[71] is the contrary either everywhere or nowhere. But in those cases where there are no contraries, the belief opposite to the true one is certainly false—for example, he who thinks that a human is not a human is deceived. If, then, these are contraries, so too are the others, those of the contradictory.

Further, the belief about the good, that it is good, and that about the not good, that it is not good, are alike; and so, in addition, are the belief about the good, that it is not good, and that about the not good, that it is good. What belief, then, is contrary to the true belief about the not good, that it is not good? Certainly not the one that says that it is bad; for this might sometimes be true at the same time, but a true belief is never contrary to a true one (for there is something not good that is bad, so that it is possible for both to be true at the same time). Nor again is it the belief that it is not bad; for these too might hold at the same time. Thus, as contrary to the belief about the not good, that it is not good, there remains the belief about the not good, that it is good. So the belief about the good too, that it is not good, is contrary to the belief about the good, that it is good.

It is evident that it will make no difference even if we regard the affirmation as universal. For the universal negation will be contrary—for example, the belief that none of the goods is good will be contrary to the belief to the effect that every good is good. For the belief about the good, that it is good, if "the good" is taken universally, is the same as the belief to the effect that whatever is good is good. And this is no different from the belief that everything which is good is good. And similarly also in the case of the not good.

So, if indeed this is how matters stand with beliefs, and voiced affirmations and negations are tokens of things in the soul, clearly what is contrary to an affirmation is the universal negation about the same thing—for example, the contrary of "Every good is good" or "Every human is good" is "No good . . ." or "No human . . ." while "Not every good . . ." or "Not every human . . ." is opposed contradictorily. It is evident also that it is not admissible either for a true belief or for a true member of a contradictory pair to be contrary to another true one. For contrary beliefs are about opposites; and while it is admissible for the same person to speak truly about them, it is not admissible for contraries to hold of the same thing at the same time.

71. Reading ἡ τῆς ἀντιφάσεως with Weidemann.

PRIOR ANALYTICS*

BOOK 1

1.1
Subject and Scope; Key Terms Defined

First, we must say what our inquiry is about and what it falls under: it is about demonstration and it falls under demonstrative science. Next, we must define what a premise is, what a term is, what a deduction is, and what sort of deduction is complete and what sort incomplete; and after these matters, what it is for something to be or not be in something as a whole, and what we mean by "to be predicated of every" or "predicated of none."

A premise, then, is a sentence that affirms or negates something of something. This sentence may be universal, particular, or indeterminate. I call belonging to every or to none "universal"; belonging to some, not to some, or not to every "particular"; and I call "indeterminate" belonging or not belonging without "universal" or "particular" (for example, "the science of contraries is the same" or "pleasure is not a good." A demonstrative premise differs from a dialectical one in that the demonstrative premise is supposing one or the other part of a contradiction (for someone who demonstrates does not ask but instead supposes), whereas a dialectical premise is the asking of a contradiction. However, this will make no difference as to whether a deduction comes about in either case; for both the one who demonstrates and the one who questions deduce by supposing something about something, either belonging or not belonging. Consequently, a deductive premise, unconditionally, will be either the affirmation or the negation of one thing about another in the way just said. It is demonstrative if it is true and has been obtained through the initial assumptions, while a dialectical premise is, for someone getting answers, the posing of a contradiction as a question, but, for someone deducing, supposing something apparent and acceptable, as was said in the *Topics*.[1] So then, what a premise is and how deductive, demonstrative, and dialectical premises differ will be stated more precisely in what follows, but let the definitions given now be sufficient for our present needs.

* Translated by Robin Smith. Text: W. D. Ross, *Aristotelis Analytica Priora et Posteriora* (Oxford, 1964; corrected, 1968).

1. *Top.* 100^{a}29–30.

I call a "term" that into which a premise is decomposed—that is, both what is predicated and that of which it is predicated (or[2] with the words "is" and[3] "is not" added to them or separating them[4]).

A deduction is an argument in which, certain things having been assumed, something different from the things assumed follows of necessity in virtue of their being so. By "in virtue of their being so," I mean "following through them," and by "following through them," I mean "needing no further term from outside in order for the necessity to come about." I call a deduction "complete" if it stands in need of nothing else besides what was supposed for the necessity to be evident; I call it "incomplete" if it still needs one or more things that are necessary through the terms assumed but have not been supposed through premises. For one thing to be in another as a whole is the same as for the latter to be predicated of all of the former. We call it "being predicated of every" when it is not possible to take anything of the subject[5] of which the other term will not be said, and "being predicated of none" likewise.

1.2
Conversions of Non-modal Premises

25[a]1 Given that every premise is one of belonging, or belonging of necessity, or being possible to belong; and of these, some are affirmative and others negative for each designation, respectively; and of the affirmative and negative premises, in turn, some are universal, some are in part, and some indeterminate—it is necessary, then, that a universal privative premise regarding belonging converts with respect to its terms. For example, if no pleasure is a good, neither will any good be a pleasure. And the positive premise necessarily converts, though not universally but in part. For example, if every pleasure is a good, some good will also be a pleasure. Among particular premises, it is necessary that the affirmative convert with respect to a part (for example, if some pleasure is a good, some good will also be a pleasure), but not necessary for the privative to (for example, it is not the case that if human does not belong to some animal, animal will also not belong to some human).

First, then, let premise AB be universal and privative. Then, if A belongs to none of the Bs, neither will B belong to any of the As.[6] For if it does belong to one (for example, to C), it will not be true that A belongs to none of the Bs;[7] for C is one

2. Reading ἢ.
3. Reading καὶ.
4. Retaining ἤ διαιρουμένου. In Greek, the words "is" or "is not" in a sentence predicating B of A may be in front of the two terms ("Is A B"), or follow them ("A B is"), or fall between ("separating") them ("A is B"), or may not occur at all ("B (the) A").
5. Retaining τοῦ ὑποκειμένου.
6. Reading οὐδενὶ τῶν B . . . οὐδὲ τῶν A οὐδενὶ.
7. Reading μηδενὶ τῶν B.

of the Bs. And if A belongs to every B, B will belong to some one of the As. For if it belongs to none, neither will A belong to any B; but it was assumed to belong to every B.

And similarly if the premise is of a part. For if A belongs to some one of the Bs, necessarily B belongs to some one of the As[8] (for if it belongs to none, neither will A belong to any of the Bs[9]). But if A does not belong to some one of the Bs, it is not necessary that B also not belong to some one of the As (for example, if B is animal and A human: human does not belong to every animal, but animal belongs to every human).

1.3
Conversions of Necessary and Possible Premises

It will be the same way in the case of necessary premises: that is, the universal privative premise converts universally, while each sort of affirmative premise converts in respect of a part. For if it is necessary that A belongs to none of the Bs, it is necessary that B belongs to none of the As (for if it is possible that it belongs to some, it would also be possible that A belongs to some B). And if A belongs to all or some one of the Bs of necessity, it is necessary that B belong to some A (for if it is not necessary, neither would A belong to some B of necessity). But the privative particular does not convert, due to the same cause as we said previously.

In the case of possible premises, since things are said to be possible in many ways—for we say that what is necessary is possible, and also that what is not necessary is, and also that what is potential is—the situation with respect to conversion will be the same in all these cases with the affirmatives. For if it is possible for A to belong to every or to some B, it will also be possible for B to belong to some A: for if it is not possible for it to belong to any, neither will it be possible for A to belong to any B (this was proved previously[10]).

But it is not the same way with negative premises, although it is the same for those said to be possible because they of necessity do not[11] belong or do not of necessity belong—for example, if someone should say that it is possible that a human is not a horse or that white belongs to no cloak. For the first of these of necessity does not belong, while the second does not necessarily belong, and the premise converts similarly. For if it is possible that horse belongs to no human, it is possible that human belongs to no horse; and if it is possible that white belongs to no cloak, it is possible that cloak belongs to no white. For if it is necessary to some, white will also belong

8. Reading τινὶ τῶν B . . . τινὶ τῶν A.
9. Reading οὐδενὶ τῶν B.
10. $25^{a}29–32$.
11. Reading τῷ ἐξ ἀνάγκης μὴ ὑπάρχειν ἢ τῷ μὴ ἐξ ἀνάγκης ὑπάρχειν.

of necessity to some cloak (this was proved previously[12]). It is the same way with the negative particular premise.

But what is said to be possible because of being so for the most part or being naturally so (which is the way that we define possible) will not be in the same relationship in privative conversions; instead, the universal privative premise does not convert and the particular premise does.

This will be evident when we discuss the possible. For the present, however, let this much be clear in addition to what has been said: that "is possible to belong to none" or "is possible not to belong to some" is affirmative in form. For "is possible" is ordered in the same way as "is," and "is" always and in all ways makes what it is added to in predication an affirmation, as in "is not-good" or "is not-white," or simply "is not-this" (this too will be proved in what follows[13]); and with respect to their conversions, they will be in the same relationship as the others.

1.4
Deductions in the First Figure

Having made these distinctions, let us proceed to say through what, when, and how every deduction comes about. (Demonstration will need to be discussed later. Deduction must be discussed before demonstration because deduction is more universal: a demonstration is a sort of deduction, but not every deduction is a demonstration.)

Whenever, then, three terms are so related to each other that the last is in the middle as a whole and the middle is either in the first as a whole or not in it as a whole, there is necessarily a complete deduction of the extreme terms. (I call that term the "middle" which both is itself in another and has another in it—this is also middle in position—and call both what is itself in another and what has another in it "extremes.") For if A is predicated of every B and B of every C, necessarily A is predicated of every C (for it was said earlier what we mean by "of every"[14]). Similarly, if A is predicated of no B and B of every C, it is necessary that A will belong to no C. But if the first term follows all the middle and the middle belongs to none of the last, there will not be a deduction of the extremes; for nothing necessary results in virtue of these things being so. For it is possible for the first extreme to belong to all as well as to none of the last, so that neither a particular nor a universal conclusion becomes necessary; and, since nothing is necessary because of these, there will not be a deduction. Terms for belonging to every are animal, human, horse; for belonging to none, animal, human, stone. Nor when the first term belongs to no middle and the middle term to no last: there will not be a deduction this way either. Terms for belonging are science, line, medicine; for not belonging, science, line, unit.

12. 25ᵃ32–34.
13. 32ᵃ29–ᵇ3; cf. 1.46.
14. 24ᵇ26–30.

When the terms are universal, then, it is clear when there will and when there will not be a deduction in this figure. And it is also clear both that if there is a deduction, the terms must necessarily be related as we have said, and that if they are related in this way, there will be a deduction.

If one of the terms is universal and the other particular in relation to the remaining term, then when the universal is put with the major extreme (whether it is positive or privative) and the particular is put with the positive minor extreme, there will necessarily be a complete deduction, but when the universal is supposed in relation to the minor extreme, or when the terms are related in any other way, this is impossible. (I call that extreme the "major" which the middle is in and that extreme the "minor" which is under the middle.) For let A belong to every B and B to some C. Then if "to be predicated of every" means what was said at the start, it is necessary that A belongs to some C. And if A belongs to no B and B to some C, it is necessary that A does not belong to some C—for what we mean by "predicated of no" has been defined—so that there will be a complete deduction. And similarly if BC is indeterminate while being positive (for it will be the same deduction whether an indeterminate or a particular premise is supposed).

But if the universal is put with the minor extreme (whether positive or privative), there will not be a deduction either when the indeterminate or particular is affirmative or when it is negative (that is, if A belongs or does not belong to some B and B belongs to every C). Terms for belonging are good, state, practical wisdom; terms for not belonging are good, state, ignorance. Next, if B belongs to no C and A belongs or does not belong to some B, or does not belong to every B, there will not be a deduction in this way either. Terms are white, horse, swan; white, horse, raven. And the same terms also if AB is indeterminate.

Nor will there be a deduction when the term related to the major extreme is universally either positive or privative and the term related to the minor is privative and particular, whether this is supposed as indefinite or as particular[15] (for example, if A belongs to every B and B does not belong to some C, or if it does not belong to every C). For whatever part [of the last extreme] the middle does not belong to, the first extreme can follow both all and none of that. For let the terms animal, human, and white be assumed, and next, from among those white things human is not predicated of, let swan and snow be selected. Then, animal is predicated of all of one but of none of the other, so that there will not be a deduction.

Again, let A belong to no B and B not belong to some C, and let the terms be inanimate, human, white. Next, let swan and snow be selected from among those white things human is not predicated of (for inanimate is predicated of all of one and none of the other). In addition, since "B does not belong to some C" is indeterminate and is a true statement if B belongs to none as well as if it does not belong to all (because it does not belong to some), and since a deduction does not come about

15. Retaining ἀδιορίστου τε καὶ ἐν μέρει ληφθέντος.

when terms are supposed such that B belongs to none (this was said previously[16]), it is evident that there will not be a deduction through the terms being in this relationship either (for there would also have been one for those terms). It may be proved similarly if the universal is put as privative.

Nor will there be a deduction in any way if both the intervals[17] are particular, whether they are said positively, or privatively, or one positively and the other privatively, or one is indeterminate and the other determinate, or both are indeterminate. Common terms for them all are animal, white, horse; animal, white, stone.

It is evident from what has been said, then, that if there is a particular deduction in this figure, it is necessary for the terms to be related as we have said; for when they are related otherwise, in no way does a deduction come about. It is also clear that all the deductions in it are complete (for they are all brought to completion through the premises initially supposed), and that all the problems[18] are proved through this figure (that is, belonging to every, to none, to some, and not to some). I call this sort of figure the "first."

1.5
Deductions in the Second Figure

When the same thing belongs to all of one term and to none of the other, or to all of each or none of each, I call such a figure the "second." In it, I call that term the "middle" which is predicated of both and call those of which this is predicated "extremes"; the "major" extreme is the one placed next to the middle, and the "minor" extreme is the one further from the middle. The middle is placed outside the extremes and is **27ᵃ1** first in position. There cannot be a complete deduction in this figure in any way, but there can be a potential[19] one, both when the terms are universal and when they are not universal.

When the terms are universal, there will be a deduction when the middle belongs to all of one term and none of the other, no matter which term the privative is put with, but otherwise in no way. For let M be predicated of no N but of every X. Then, since the privative converts, N will belong to no M. But M was assumed to belong to every X, so that N belongs to no X (for this has been proved previously[20]). Next, if M belongs to every N but to no X, neither will X belong to any N. For if M belongs to no X, neither does X belong to any M; but M belonged to every N; therefore, X will belong to no N (for the first figure has again come about). And since the privative converts, neither will N belong to any X, so that there will be the same deduction.

16. 26ᵃ9–13.
17. I.e., premises.
18. I.e., sorts of conclusions.
19. I.e., incomplete.
20. 27ᵃ5–8.

(It is also possible to prove these results by reducing to the impossible.) It is therefore evident that a deduction comes about when the terms are related in this way, but it is not complete; for the necessary result is brought to completion, not from the initial premises alone, but from others in addition.

But if M is predicated of every N and of every X, there will not be a deduction. Terms for belonging are substance, animal, human; for not belonging, substance, animal, number (the middle is substance). Nor when M is predicated neither of any N nor of any X. Terms for belonging are line, animal, human; for not belonging, line, animal, stone.

It is evident, then, that if there is a deduction when the terms are universal, it is necessary for the terms to be related as we said at the start; for if they are otherwise, a necessary result does not come about.

If the middle is universal only in relation to one term, when it is universal in relation to the major extreme (whether positively or privatively) but particular in relation to the minor and oppositely to the universal (by "oppositely" I mean that if the universal is privative, then the particular is affirmative, while if the universal is positive the particular is privative), it is necessary for a privative particular deduction to come about. For if M belongs to no N and to some X, it is necessary that N does not belong to some X. For since the privative converts, N will not belong to any M; but M was assumed to belong to some X; consequently, N will not belong to some X, for a deduction through the first figure comes about. Next, if M belongs to every N but does not belong to some X, it is necessary for N not to belong to some X. For if it belongs to every X and M is also predicated of every N, it is necessary for M to belong to every X, but it was assumed not to belong to some. And if M belongs to every N but not to every X, there will be a deduction that N does not belong to every X. (The demonstration is the same.) But if it is predicated of every X and not of every N, there will not be a deduction (terms are animal, substance, raven; animal, white, raven). Nor will there be one when it is predicated of no X but of some N (terms for belonging are animal, substance, unit; for not belonging, animal, substance, science).

When the universal premise is opposite to the particular, then, it has been said when there will and when there will not be a deduction. But when the premises are the same in form (that is, both are privative or both affirmative), in no way will there be a deduction. For let the premises first be privative, and let the universal be put with the major extreme (that is, let M belong to no N and not to some X). It is then possible for N to belong to every X as well as to none. Terms for not belonging are black, snow, animal. We cannot get terms for belonging if M belongs to some X and does not belong to some. For if N belongs to every X and M to no N, M will belong to no X: but it was assumed to belong to some. We cannot get terms in this way, then, and it must be proved from the indeterminate. For since "M does not belong to some X" is also true even if M belongs to no X and there was not a deduction when it belonged to none, it is evident that there will not be one in the present case either.

Next, let the premises be positive, and let the universal be supposed in the same way as the particular (that is, let M belong to every N and to some X). It is then possible for N to belong to every X as well as to none. Terms for belonging to none are white, swan, stone, but we will not be able to get terms for belonging to every due to the same cause as previously; it must instead be proved from the indeterminate. And if the universal is by the minor extreme (that is, M belongs to no X and does not belong to some N), it is possible for N to belong to every X as well as to none. Terms for belonging are white, animal, raven; for not belonging, white, stone, raven. If the premises are positive, terms for not belonging are white, animal, snow; for belonging, white, animal, raven.

It is evident, then, that when the premises are the same in form, and one is universal and one particular, a deduction does not come about in any way. And neither does it if the middle term belongs or does not belong to some of each extreme, or belongs to one and does not belong to the other, or not to all of either, or indeterminately. Common terms for all these are white, animal, human; white, animal, inanimate.

From what has been said, then, it is evident both that if the terms are related to each other as was said, a deduction comes about of necessity and that if there is a deduction, it is necessary for the terms to be so related. It is also clear both that all the deductions in this figure are incomplete (for they are all brought to completion by taking in addition certain things which either are implicit in the terms of necessity or are supposed as assumptions, as when we prove through an impossibility) and that an affirmative deduction does not come about through this figure, but rather all the deductions, universal as well as particular, are privative.

1.6
Deductions in the Third Figure

If one term belongs to all and another to none of the same thing, or if they both belong to all or none of it, I call such a figure the "third." By the "middle" in it I mean that term of which they are both predicated, and by "extremes" the things predicated: by "major" extreme I mean the one farther from the middle and by "minor" the one closer. The middle is placed outside the extremes and is last in position. A complete deduction does not come about in this figure either, then, but a potential one may, both when the terms are universal and when they are not universal in relation to the middle.

With universal terms, then, when both P and R belong to every S, it follows of necessity that P will belong to some R. For since the positive premise converts, S will belong to some R; consequently, since P belongs to every S and S to some R, it is necessary that P belongs to some R; for it becomes a deduction through the first figure. It is also possible to carry out the demonstration through the impossible and through the setting-out. For if both terms belong to every S, if some one of the Ss

is selected (for example, N), both P and R will belong to this; consequently, P will belong to some R.

And if R belongs to every S but P to none, there will be a deduction that P of necessity does not belong to some R (for the way of demonstrating it is the same if premise RS is converted). It could also be proved through the impossible as in the previous cases. But if R belongs to no S and P belongs to every S, there will not be a deduction (terms for belonging are animal, horse, human; for not belonging, animal, inanimate, human). Nor will there be a deduction when both are said of no S (terms for belonging are animal, horse, inanimate; for not belonging, human, horse, inanimate; the middle is inanimate).

It is therefore evident when there will and when there will not be a deduction with universal terms in this figure. For when both terms are positive, there will be a deduction that one extreme belongs to some of the other extreme, but when they are privative there will not be. And when one term is privative and the other affirmative, if the major term is privative and the other term affirmative, there will be a deduction **28^b1** that one extreme does not belong to some of the other, but if it is the other way around, there will not be one.

If one term is universal in relation to the middle and the other term is particular, when both terms are positive it is necessary for a deduction to come about, no matter which of the terms is universal. For if R belongs to every S and P to some S, it is necessary that P belongs to some R. For since the affirmative converts, S will belong to some P; consequently, since R belongs to every S and S to some P, R will also belong to some P, and consequently P to some R. Next, if R belongs to some S and P to every S, it is necessary that P belongs to some R (for it is demonstrated in the same way). It can also be demonstrated through the impossible or by means of the setting-out, as in the previous cases.

But if one term is positive, the other privative, and the positive term is universal, when the minor term is positive, there will be a deduction. For if R belongs to every S and P does not belong to some, it is necessary that P does not belong to some R. For if it belongs to every R and R to every S, P will also belong to every S; but it did not belong. (This can also be proved without reduction if some one of the Ss is taken to which P does not belong.) But when the major term is positive (for example, if P belongs to every S and R does not belong to some S), there will not be a deduction. Terms for belonging to every are animate, human, animal. We cannot get terms for belonging to none, if R belongs to some S and does not belong to some S (for if P belongs to every S and R to some S, P will belong to some R, but it was assumed to belong to none). We must rather take it as in the previous cases, that is, since "does not belong to some" is indeterminate it is true to say that what belongs to none does not belong to some, and when it belonged to none there was not a deduction. It is therefore evident that there will not be a deduction.

If the privative term is universal, when the major term is privative and the minor positive, there can be a deduction. For if P belongs to no S and R belongs to some S,

P will not belong to some R; for it will be the first figure again when premise RS is converted. But when the minor term is privative, there will not be a deduction (terms for belonging are animal, human, wild; for not belonging, animal, science, wild; the middle in both is wild). Nor can there be a deduction when both terms are put as privative but one is universal and the other particular. Terms for the case when the minor extreme is universal in relation to the middle are animal, science, wild; animal, human, wild. When the major extreme is universal, terms for not belonging are raven, snow, white. We cannot get terms for belonging if R belongs to some S and does not belong to some: for if P belongs to every R and R to some S, P will also belong to some S, but it was assumed to belong to none. Instead, it must be proved from the indeterminate.

Nor will there be a deduction in any way if each term belongs or does not belong to some of the middle, or if one belongs and the other does not belong, or if one belongs to some and the other not to every, or if they belong indeterminately. Common terms for all these are animal, human, white; animal, inanimate, white.

Therefore, it is also evident when there will and when there will not be a deduction in this figure, and [it is evident] both that if the terms are related as was said, a deduction comes about of necessity, and that if there is a deduction, it is necessary for the terms to be so related. It is also evident that all the deductions in this figure are incomplete (for all are completed by taking certain things in addition) and that it is not possible to deduce a universal conclusion, whether privative or affirmative, through this figure.

1.7
More on Deductions; All Deductions Reduce to the First Figure

It is also clear that in all the figures, whenever a deduction does not come about, if both the terms are positive or privative no necessary result comes about at all, but if one term is positive and the other privative, when the privative is taken as universal, a deduction of the minor extreme in relation to the major always comes about. For example, if A belongs to every or to some B and B to no C: when the premises are converted, it is necessary that C does not belong to some A. And similarly in the case of the other figures, for a deduction always comes about through conversion. It is also clear that putting an indeterminate premise in place of a positive particular will produce the same deduction in all the figures.

It is furthermore evident that all the incomplete deductions are completed through the first figure. For they all come to a conclusion either probatively or through the impossible, and in both ways it becomes the first figure. With those completed probatively, that is because they all come to a conclusion through conversion, and conversion produces the first figure. For those proved through the impossible, this is because, when a falsehood is supposed, the deduction comes about through the first

figure. For example, it is proved in the last figure that if both A and B belong to every C, A will belong to some B: for if it belongs to none and B to every C, A will belong to no C: but it belonged to every C. And similarly also in the other cases.

It is also possible to reduce all deductions to the universal deductions in the first **29^b1** figure. It is evident that those in the second figure are completed through these deductions, although not all in the same way: the universal deductions are completed when the privative premise is converted, but each of the particular deductions is completed through reducing to the impossible. As for the deductions in the first 5 figure, the particular ones are indeed brought to completion through themselves, but it is also possible to prove them through the second figure by reducing to the impossible. For example, if A belongs to every B and B to some C, we can prove that A belongs to some C. For if it belongs to no C and to every B, B will not belong to any C (for we know this through the second figure). The demonstration will also 10 proceed similarly in the case of the privative deduction. For if A belongs to no B and B to some C, A will not belong to some C. For if it belongs to every C, but to no B, neither will B belong to any C (this was the middle figure). Consequently, since the deductions in the middle figure are all reduced to the universal deductions in the 15 first, while the particular deductions in the first figure are reduced to the deductions in the middle figure, it is evident that the particular deductions can also be reduced to the universal deductions in the first figure. The deductions in the third figure are brought to completion directly through those [in the first figure] when their terms are universal and through the particular deductions in the first figure when their terms 20 are taken as particular. But the latter were reduced to the former, and so the particular deductions in the third figure are also reduced to them. It is evident, then, that they all can be reduced to the universal deductions in the first figure. 25

It has been said, then, how those deductions that prove something to belong or not to belong are related: both how those from the same figure are related among themselves, and how those from different figures are related to each other.

1.8
Deductions with Two Necessary Premises

Since to belong, to belong of necessity, and to be possible to belong are distinct (for 30 many things belong, but nonetheless not of necessity, while others neither belong of necessity nor belong at all, but it is possible for them to belong), it is clear that there will also be distinct deductions of each and that their terms will not be alike: instead, one deduction will be from necessary terms, one from belonging terms, and one from possible terms. 35

In the case of necessary premises, then, the situation is almost the same as with premises of belonging: that is, when the terms are put in the same way both in the case of belonging and in the case of belonging or not belonging of necessity, there

will likewise either be or not be a deduction (except that these will differ by adding
30ᵃ1 "belonging (or not belonging) of necessity" to the terms). For the privative premise converts in the same way, and we will define "being in as a whole" and "predicated of every" in the same way.

In the other cases, then, the necessary conclusion will be proved through conversion in the same way as in the case of belonging. But in the middle figure, when the universal is affirmative and the particular is privative, and again in the third, when the universal is positive and the particular privative, the demonstration is not possible in the same way, and instead it is necessary to set-out that part to which each term does not belong and construct the deduction about this. For [the term] will be necessary of [each of] these; and if it is necessary of what is set-out, it will be necessary of some part of that former term (for what is set-out is precisely a certain *that*). Each of these deductions occurs in its own figure.

1.9
Deductions with One Necessary Premise in the First Figure

It sometimes happens that the deduction is necessary when only one of the premises is necessary—not, however, whatever premise one likes, but only the premise directed to the major extreme. For example, if A has been taken to belong or not to belong of necessity to B, and B only to belong to C. For if the premises have been taken in this way, A will belong or not belong to C of necessity. For since A belongs or does not belong of necessity to every B and C is some one of the Bs, it is evident that one or the other of these will also apply to C of necessity.

However, if AB is not necessary but BC is necessary, the conclusion will not be necessary. For if it is, that A belongs of necessity to some B will result both through the first and through the third figure. But this is false: for it is possible for B to be the sort of thing that it is possible A belongs to none of. It is in addition evident from terms that the conclusion can fail to be necessary, as, for example, if A is movement, B animal, and C stands for human. For a human is of necessity an animal, but an animal does not move of necessity, nor does a human. It would also be similar if AB were privative (for the demonstration is the same).

In the case of particular deductions, if the universal is necessary, the conclusion will also be necessary, but if the particular is, the conclusion will not be necessary either when the universal premise is privative or when it is positive. First, then, let the universal be necessary, and let A belong to every B of necessity, but let B only belong to some C. Then it is necessary for A to belong to some C of necessity (for C is below B, and A belonged to every B of necessity). It will also be this way if the deduction
30ᵇ1 is privative; for the demonstration will be the same. But if the particular is necessary, the conclusion will not be necessary (for nothing impossible happens), as it was also

in the case of universal deductions. And similarly in the case of the privatives. Terms are movement, animal, white.

1.10
Deductions with One Necessary Premise in the Second Figure

In the case of the second figure, if the privative premise is necessary, the conclusion will also be necessary, but if the positive premise is, the conclusion will not be necessary. For first let the privative be necessary, and let it not be possible that A belongs to any B, but let A merely belong to C. Then, since the privative converts, neither is it possible for B to belong to any A. But A belongs to every C, so that it is not possible for B to belong to any C (for C is below A). And likewise also, if the privative is put with C. For if it is not possible for A to belong to any C, neither will it be possible for C to belong to any A. But A belongs to every B; consequently, it will not be possible for C to belong to any of the Bs;[21] for it becomes the first figure again. Therefore, neither will it be possible for B to belong to C, for it converts similarly.

But if the positive premise is necessary, the conclusion will not be necessary. For let A belong to every B of necessity but merely belong to no C. Then when the privative premise is converted, it becomes the first figure, and it was proved[22] that in the first figure, when a privative premise that is related to the major term is not necessary, the conclusion will not be necessary either. Consequently, neither will it be of necessity in this case. Moreover, if the conclusion is necessary, it follows that C of necessity does not belong to some A. For if B belongs of necessity to no C, C will also belong of necessity to no B. But it would be necessary for B to belong to some A, if indeed A belonged to every B of necessity. Consequently, it would be necessary for C not to belong to some A. But nothing prevents something having been taken as A to all of which it is possible that C belongs. Moreover, it would be possible to prove by setting-out terms that the conclusion is not unconditionally necessary but only necessary when these things are so. For example, let A be animal, B human, C white, and let the premises have been taken in the same way. So it is possible that animal belongs to nothing white. Human will then indeed not belong to anything white either, but not of necessity; for it is possible for a human to become white, although not while animal belongs to nothing white. Consequently, the conclusion will be necessary when these things are so, but not unconditionally necessary.

It will be the same in the case of the particular deductions. For when the privative premise is both universal and necessary, the conclusion will also be necessary; but when the positive premise is universal and the negative premise is particular, the conclusion will not be necessary. First, then, let the privative premise be both

21. Reading οὐδενὶ τῶν B.
22. 30^a23–32.

universal and necessary: and let it not be possible that A belongs to any B, but let it belong to some C. Then, since the privative converts, neither will it be possible that B belongs to any A. But A belongs to some one of the Cs, so that B will of necessity not belong to some one of the Cs.[23] Next, let the positive premise be both universal and necessary, and let the positive be put with B. So if A belongs to every B of necessity, but does not belong to some C, it is evident that B will not belong to some C, but not of necessity. (For the same terms will serve for the demonstration as in the case of the universal deductions.) But neither will the conclusion be necessary if the privative, taken as particular, is necessary (for the demonstration is through the same terms).

1.11
Deductions with One Necessary Premise in the Third Figure

In the last figure, if the terms are universal in relation to the middle and both the premises are positive, then if either one is necessary the conclusion will also be necessary. However, if one is privative and the other positive, then when the negative is necessary the conclusion will also be necessary, but when the positive is necessary the conclusion will not be necessary. For let both premises first be positive, and let both A and B belong to every C, but let AC be necessary. Then, since B belongs to every C, C will also belong to some B (because the universal converts into a particular). Consequently, if A belongs to every C of necessity and C belongs to some B, it is also necessary for A to belong to some B (for B is under C). It becomes the first figure, then. And it will also be proved in the same way if BC is necessary. For C converts to some A, so that if B belongs to every C of necessity, it will also belong to some A of necessity.

Next, let AC be privative, BC affirmative, and the privative necessary. Then, since C converts to some B and A belongs of necessity to no C, A will also of necessity not belong to some B (for B is below C). But if the positive premise is necessary, the conclusion will not be necessary. For let BC be positive and necessary and AC privative and not necessary. Then, since the affirmative converts, C will belong to some one of the Bs[24] of necessity. Consequently, if A belongs to no C and C to some one of the Bs,[25] A will not belong to some one of the Bs, but not of necessity: for it was proved[26] in the first figure that when the privative premise is not necessary, the conclusion will not be necessary either. This could also be evident through terms. For let A be good, B stand for animal, and C horse. Then it is possible that good belongs to no horse and necessary that animal belongs to every horse, but it is not necessary for some animal not to be good, if indeed it is possible for every one to be good. (Or

23. Reading τινὶ τῶν Γ . . . τινὶ τῶν Γ.
24. Reading τινὶ τῶν Β.
25. Reading τινὶ τῶν Β . . . τινὶ τῶν Β.
26. 30a23–32, 30b2–6.

if this is not possible, being awake or sleeping should be put as a term instead, for every animal is receptive of these.)

It has been said, then, when the conclusion will be necessary if the terms are universal in relation to the middle. But if one term is universal, the other is particular, and both are positive, the conclusion will be necessary whenever the universal is necessary. The demonstration is the same as the previous one; for the positive particular also converts. Thus, if it is necessary for B to belong to every C and A is below C, it is necessary for B to belong to some A. But if it is necessary for B to belong to some A, it is also necessary for A to belong to some B (for it converts). It would also be similar if AC were necessary and universal (for B is below C).

If the particular premise is necessary, the conclusion will not be necessary. For let BC be both particular and necessary. And let A belong to every C, however not of necessity. Then, when BC is converted, it becomes the first figure, and the universal premise is not necessary while the particular premise is necessary. But when the premises were like this, the conclusion was not necessary; consequently, it will not be in this case either. Moreover, this is also evident from terms. For let A be wakefulness, B something two-footed, and C stand for animal. Then, it is necessary that B belongs to some C, it is possible that A belongs to C, and it is not necessary for A to belong to B (for it is not necessary for something two-footed to be asleep or awake). It can also be proved in the same way, through the same terms, if AC is both particular and necessary.

But if one of the terms is positive and the other privative, when the universal is both privative and necessary, the conclusion will also be necessary. For if it is not possible for A to belong to any C, and B belongs to some C, it is necessary that A does not belong to some B. But when the affirmative is put as necessary (whether it is universal or particular), or when the privative is particular, the conclusion will not be necessary. The proofs for the rest are the same as those we said concerning the previous cases; terms for the case in which the necessary positive premise is universal are wakefulness, animal, human (with human the middle); when the positive necessary premise is particular, they are wakefulness, animal, white. For it is necessary **32^a1** that animal belongs to something white, but it is possible that wakefulness belongs to nothing white, and it is not necessary that wakefulness does not belong to some animal. When the privative is particular and necessary, the terms are two-footed, moving, animal (with animal the middle).

1.12
Some Results about Deductions with Necessary Premises

It is evident, then, that there is no deduction of belonging unless both the premises express belonging; a deduction of belonging of necessity is possible, however, even when only one premise is necessary. But in both cases, with either affirmative or

privative deductions, it is necessary for one or the other premise to be like the conclusion. By "like" I mean that if the conclusion is belonging, the premise must be belonging, and if the conclusion is necessary, the premise must be necessary. Consequently, this also is clear, that the conclusion cannot be either necessary or belonging unless a necessary or a belonging premise has been taken.

1.13
Conversion of Possible Premises; Definition of Possible

About enough has been said, then, concerning what is necessary, how it comes about, and what differentiates it in relation to what belongs. After this, let us say when, and how, and through what premises there can be a deduction of what is possible. I use the expressions "to be possible" and "what is possible" of whatever is not necessary but, when it is supposed to be the case, nothing will be impossible because of this (for we say that what is necessary is possible homonymously). {It is evident that this is what "possible" is from opposed pairs of negations and affirmations. For "it is not possible to belong" and "it is impossible to belong" and "it is necessary not to belong" are either the same or follow each other, and so their opposites "it is possible to belong," "it is not impossible to belong," and "it is not necessary not to belong" will also either be the same or follow from each other (for either the affirmation or the negation is [true] of everything). Therefore, what is possible will not be necessary and what is not necessary will be possible.}[27]

It follows that all premises about being possible convert with each other. I do not mean that affirmative premises convert with negatives, but rather that such as have an affirmative form convert with respect to their opposite: that is, "possible to belong" converts to "possible not to belong," "possible to belong to every" converts to "possible to belong to no" (or "not to every"), and "it is possible to belong to some" converts to "it is possible not to belong to some." It is also the same way for the others. For since what is possible is not necessary, and it is possible for what is not necessary not to belong, it is evident that, if it is possible for A to belong to B, it is also possible for it not to belong; and, if it is possible for it to belong to every one, it is also possible for it not to belong to every one. And it will also be the same in the case of particular affirmations (for the demonstration is the same). Such premises as these are positive and not privative: for "to be possible" is ordered in the same way as "to be," as was said previously.[28]

Having made these distinctions, let us say next that things are said to be possible in two ways. One is what happens for the most part and falls short of necessity, as for a human to turn gray or grow or shrink, or, in general, for what is natural to belong

27. Rejected as an inauthentic later addition by most editors, because of its apparent inconsistency with the definition of "possible."
28. 25b19–25.

(for this does not have continuous necessity because a human does not always exist; however, when a human does exist, it happens either of necessity or for the most part). The other is the indefinite, that which is capable of being thus as well as not thus, as for an animal to walk or for there to be an earthquake while one is walking, or, in general, what comes about by luck (for it is no more natural for this to happen in one way than in the contrary way). Each of these sorts of possible premise converts with its opposite premise, although not in the same way. A premise about what is natural converts because it does not belong of necessity (for it is in this way that it is possible for a human not to turn gray), whereas a premise about what is indefinite converts because it is no more this way than that. Science—that is, demonstrative deduction—is not possible concerning the indefinite because the middle term is disorderly, but it is possible concerning what is natural, and arguments and inquiries pretty much arise about what is possible in this way. A deduction could perhaps arise about the former, but that is at any rate not usually sought for.

These matters will be better determined in what follows, but for the present let us say when and how there can be a deduction from possible premises, and what it will be. The expression "it is possible for this to belong to that" may be understood in two ways: it may mean either "to that to which this belongs" or "to that to which it is possible that this belongs." (For "A is possible of that of which B" signifies one or the other of the following: "of which B is said" or "of which it is possible that B is said." But "A is possible of that of which B" is no different from "it is possible that A belongs to every B".) Therefore, it is evident that "it is possible that A belongs to every B" may be said in two ways. So, let us first say what deduction and what sort of deduction there will be if the premises are that B is possible of what C is, and A is possible of what B is. {For in this way both premises are supposed as expressing being possible, but when the premise is that A is possible of that of which B is the case, one premise is belonging and the other is possible.}[29] So we should begin from premises that are the same in form, as also in the other cases.

1.14
Deductions with Two Possible Premises in the First Figure

When it is possible that A belongs to every B and B to every C, there will be a complete deduction that it is possible that A belongs to every C. This is evident from the definition (for this is how we meant "to be possible to belong to every"). And similarly, if it is possible that A belongs to no B and B to every C, there will be a complete deduction that A is possible to no C (since "A is not possible of that of which B is possible" meant precisely this: not leaving out anything that is possibly under B). When A is possible to every B and B is possible to no C, no deduction comes about

29. Some editors reject this sentence as a later addition.

through the premises taken, but if premise BC is converted in accord with possibility, it becomes the same deduction as before. For since it is possible that B belongs to no C, it is also possible that it belongs to every C (this was said previously[30]). So, if B belongs to every C and A to every B, the same deduction comes about again.

Similarly, if to both premises a negation is added along with "is possible" (I mean, for example, if A is possible to none of the Bs and B to none of the Cs[31]). For no deduction comes about through the premises taken, but if they are converted it will again be the same deduction as previously.

It is evident, then, that when a negation is added to the minor extreme or to both premises, either no deduction comes about, or one does come about but it is not complete (for the necessity is concluded from conversion).

But if one of the premises is taken as universal and the other as particular, when the universal premise is the one related to the major extreme there will be a complete[32] deduction. For if A is possible to every B and B to some one of the Cs, A is possible to some C (this is evident from the definition of "to be possible"). Next, if it is possible that A belongs to no B and B belongs to some C, it is necessary that it is possible for A not to belong to some one of the Cs (the demonstration is the same).

But if the particular premise is taken as privative, the universal premise as affirmative, and they are similarly positioned—that is, it is possible that A belongs to every B and possible that B does not belong to some C—then an evident deduction does not come about through the premises taken, but when the particular premise is converted and it is supposed that it is possible that B belongs to some C, there will be the same conclusion as previously, as in the initial cases.

If the premise with the major extreme is taken as particular and the premise related to the minor as universal, then whether both are put as affirmatives, or both as privatives, or they are not put as the same in form, or both as indeterminates or particulars, there will not be a deduction in any way. For nothing prevents B from extending beyond A and not being predicated of equally many things. Suppose that C is that by which B extends beyond A: it will not be possible for A to belong to all of this, or to none, or to some, or not to some, since premises according to possibility convert and it is possible for B to belong to more things than A does. Moreover, this is evident from terms. For with premises like these, it is not possible for the first term to belong to any of the last and also necessary that the first belongs to all of the last. Terms in common for all cases, for belonging of necessity, are animal, white, human; for not being possible, animal, white, cloak. Since there exist terms in this relationship, then, it is evident that no deduction comes about. For every deduction is of belonging, or of belonging of necessity, or of being possible. It is evident, then, that there is not a deduction of belonging or of belonging necessarily, for the affirmative

30. 32a29–b1.
31. Reading μηδενὶ τῶν Β . . . μηδενὶ τῶν Γ.
32. Retaining τέλειος.

deduction is ruled out by the privative conclusion and the privative deduction by the affirmative conclusion. So, what is left is a deduction of being possible. But this is impossible, for it has been proved[33] that with terms so related, it can be necessary for the first to belong to all the last, as well as not possible for the first to belong to any of the last. Thus, there will not be a deduction of being possible (for what is necessary was not possible).

It is evident, then, that when the terms are universal in possible premises, a deduction always comes about in the first figure, both when the terms are positive and when they are privative (except that when they are positive it is complete, while when they are privative it is incomplete). "To be possible" must be taken not in the sense that applies to what is necessary, but rather according to the determination stated (this is sometimes overlooked).

1.15
First Figure: One Possible and One Non-modal Premise

If one of the premises is supposed as belonging and the other as possible, then when the premise related to the major extreme signifies being possible, all the deductions will be both complete and of being possible according to the definition stated. However, when the premise related to the minor extreme does, not only are the deductions all incomplete, but also the privative deductions among them are not of what is possible according to the definition but rather of what belongs of necessity to none or not to every (for if something belongs of necessity to none, or not to every, we do also say that it is possible that it belongs to none or not to every). For let A be possible to every B and let B be put as belonging to every C. Then, since C is below B and A is possible to every B, it is evident that it is also possible for A to belong to every C. Thus, a complete deduction comes about. And similarly, if premise AB is privative, premise BC is affirmative, and one premise is taken as possible while the other is taken as belonging, there will be a complete deduction that it is possible for A to belong to no C.

It is evident, then, that when belonging is put with the minor extreme, complete deductions come about. But that there will be deductions when it is contrariwise must be proved through the impossible (and it will be clear at the same time that they are incomplete, for the proof is not from the premises taken).

It must first be said that if it is necessary that B is when A is, then when A is possible[34] B will of necessity also be possible. For with the terms like this, let what A stands for be possible and what B stands for be impossible. Then, if what is possible, when it is possible for it to be, could come about, and what is impossible, when

33. With the example terms in this same argument.

34. *Dunaton*, which can also mean "potential" (25^a37–40), is used in 34^a5–33 in place of *endechomenon* ("possible"), which is used elsewhere.

impossible, could not come about, and if A is possible and B impossible at the same time, it would be possible for A to have come about without B; and if to have come about, then also to be, for what has come about, once it has come about, is. (We must take "impossible" and "possible" not only as they apply to coming about, but also as they apply to being true, and to belonging, and however many other ways "possible" is said: it will be alike in all of them.) Next, "if A is, B is" must not be understood to mean that if some single thing A is so, B will be so. For nothing is of necessity when a single thing is so, but instead only if at least two are, that is, when the premises are so related as was said[35] concerning deductions. For if C is predicated of D, and D of E, C will also be predicated of E of necessity; and if each is possible, the conclusion will also be possible. So, if one should put the premises as A and the conclusion as B, it follows not only that when A is necessary, B is also necessary at the same time, but also that when A is possible, B is possible.

This having been proved, it is evident that when something false but not impossible is assumed, what follows through that hypothesis will also be false but not impossible. For example, if A is false but yet not impossible, and if B is when A is, B will also be false, but not impossible. For since it has been proved that if B is when A is, B will also be *possible* when A is possible, and since A was assumed to be possible, therefore B will also be possible. For if it is impossible, the same thing will be possible and impossible at the same time.

With these matters determined, let A belong to every B and let it be possible that B belongs to every C. Then it is necessary for it to be possible that A belongs to every C. For let it not be possible, and put B as belonging to every C (this is false but not impossible). Therefore, if A is not possible to every C and B belongs to every C, A will not be possible to every B (for a deduction comes about through the third figure). But it was assumed that it is possible for A to belong to every B. Therefore, it is necessary that A is possible to every C (for when something false but not impossible is supposed, what follows is impossible). {It is also possible to produce an impossibility through the first figure, supposing as a premise that B belongs to C. For if B belongs to every C and it is possible for A to belong to every B, it would be possible for A to belong to every C: but it was assumed not to be possible for it to belong to every one.}[36]

One must suppose "belonging to every" without limiting it with respect to time (for example, "now" or "at this time") but instead unconditionally. For it is also by means of these sorts of premises that we produce deductions, since there will not be a deduction if the premise is supposed as holding only with respect to a certain moment. For perhaps nothing prevents human from belonging to everything in movement at some time (that is, if nothing else should be moving), and it is possible for moving to belong to every horse, but yet it is not possible for human to belong to

35. As in 1.1–7.

36. Rejected as spurious by most editors.

any horse. Next, let the first term be animal, the middle term moving, the last term human. The premises will be in the same relationship, then, but the conclusion will be necessary, not possible (for a human is of necessity an animal). It is evident, then, that the universal should be taken as holding unconditionally and not as determined with respect to time.

Next, let AB be a universal privative premise, and let A be assumed to belong to no B, but let it be possible that B belongs to every C. With these supposed, then, it is necessary that it is possible for A to belong to no C. For let it not be possible, and let B be supposed as belonging to C, just as previously. Then, it is necessary that A belongs to some B (for a deduction comes about through the third figure). But this is impossible; consequently, A is possible to no C: for with a false supposition what follows is impossible. This deduction, then, is not of what is possible according to our definition but rather of what belongs to none of necessity, for that is the contradictory of the hypothesis that was made (for it was supposed that A belongs to some C of necessity, and a deduction through the impossible is of the opposite affirmation). Moreover, it is also evident from terms that the conclusion will not be possible. For let A be raven, B stand for thinking, and C stand for human. Then, A belongs to no B (for nothing that thinks is a raven), while B is possible to every C (for thinking is possible for every human). However, A belongs of necessity to no C; therefore, the conclusion is not possible. Yet neither is it always necessary. For let A be moving, B scientific knowledge, C stand for human. Then A will belong to no B, while B is possible to every C, and the conclusion will not be necessary (for it is not necessary that no human be moving nor necessary that some human be). It is clear, then, that the conclusion is of belonging of necessity to none.[37] (The terms should be better chosen.)

If the privative is put with the minor extreme and signifies being possible, there will be no deduction from the premises that were actually taken, but there will be one if the possible premise is converted accordingly, as in the previous cases. For let A belong to every B and let B be possible to none of the Cs. When the terms are in this relationship, nothing will be necessary, but when BC is converted and B is supposed to be possible to every C, a deduction comes about just as before (for the terms are similarly related in position).

And in the same way with both intervals privative, if AB signifies not belonging and BC signifies being possible to belong to none. For something necessary does not result at all through the premises actually taken, but when the premise according to being possible is converted there will be a deduction. For let A have been supposed to belong to no B and B to be possible to no C. Through these premises, then, nothing is necessary, but if B is assumed to be possible to every C (which is true) and premise AB remains the same, it will again be the same deduction. But if it is supposed that B does not belong to every C, and not that it is possible for it not to belong, there

37. I.e., not of necessity to any.

will in no way be a deduction, whether premise AB is privative or positive. Terms in common for belonging of necessity are white, animal, snow; terms for not being possible are white, animal, pitch.

It is evident, then, that if the terms are universal and one of the premises is supposed as belonging, the other as possible, when it is the premise related to the minor extreme that is taken to be possible, a deduction always comes about (except that sometimes it is from the premises themselves and sometimes with a premise converted). We have said when each of these sorts of deduction comes about and through what cause.

If one of the intervals is supposed as universal and the other as particular, when the interval related to the major extreme is put as universal and possible (whether negative or affirmative), and the particular is put as affirmative and belonging, there will be a complete deduction, just as when the terms are universal. (The demonstration is the same as previously.) And when the interval related to the major extreme is universal, but belonging rather than possible, and the other interval is particular and possible, then if both premises are put as negative, or both affirmative, or one negative and the other affirmative, in all these ways there will be an incomplete deduction, although some deductions will be proved through the impossible and others through the conversion of "is possible," as in the previous cases.

There will be a deduction through conversion when the universal premise, put in relation to the major extreme, signifies belonging or not belonging[38] and the particular premise is privative and supposes being possible—for example, if A belongs or does not belong to every B and it is possible that B does not belong to some C. For a deduction comes about when BC is converted according to being possible. But when the premise put as particular supposes not belonging, there will not be a deduction. Terms for belonging are white, animal, snow; for not belonging, white, animal, pitch (the demonstration must be obtained through the indeterminate).

If the universal is put in relation to the minor extreme and the particular in relation to the major, there will in no way be a deduction, regardless of whether either term is privative or positive, possible or belonging.

Nor when the premises are put as particular or indeterminate, whether they suppose being possible, or belonging, or in alternation: there will not be a deduction in this way either. The demonstration is the same as that for the previous cases. Common terms for belonging of necessity are animal, white, human; terms for not being possible are animal, white, cloak. It is evident, then, that when the premise related to the major extreme is put as universal a deduction always comes about, but when the premise related to the minor extreme is, there is never a deduction of anything.

38. Retaining ἢ μὴ ὑπάρχειν.

1.16
First Figure: One Necessary and One Possible Premise

When one of the premises signifies belonging of necessity and the other premise signifies being possible, there will be a deduction when the terms are in the same relationship [as previously], and it will be complete whenever "necessary" is put with the minor extreme. When the terms are positive, the conclusion will be one of being possible and not belonging, whether the terms are put as universal or not universal. However, if one term is affirmative and the other privative, then when the affirmative one is necessary, the conclusion will be one of being possible rather than belonging; but if the privative term is necessary, then the conclusion may be both of being possible not to belong and of not belonging, whether the terms are universal or not universal. ("Is possible" in the conclusion must be taken in the same way as in the previous cases.) There will not be a deduction [concluding that] something of necessity does not belong, for "does not of necessity belong" is different from "of necessity does not belong."

It is evident, then, that a necessary conclusion does not come about when the terms are affirmative. For let A belong to every B of necessity, and let B be possible to every C. So, there will be an incomplete deduction that it is possible for A to belong to every C. That it is incomplete is clear from the demonstration; for it will be proved in the same way as in the previous cases. **36^a1**

Next, let A be possible to every B and let B belong to every C of necessity. There will then be a deduction that it is possible for A to belong to every C, but not that it belongs; and it will be complete rather than incomplete; for it is brought to completion directly by means of the initial premises.

If the premises are not the same in form, first let the privative premise be necessary, and let A not be possible to any B, but let B be possible to every C. Then it is necessary for A to belong to no C. For let A be supposed to belong either to every or to some C. But it was assumed not to be possible for A to belong to any B. Therefore, since the privative converts, neither is B possible to any A. But it is supposed that A belongs either to every or to some C, so that it would not be possible for B to belong to any C or (respectively) to belong to every C. But it was initially assumed [to be possible] to every. It is evident that a deduction of being possible not to belong also comes about, given that there is one of not belonging.

Next, let the affirmative premise be necessary: let it be possible that A belongs to no B, and let B belong to every C of necessity. The deduction, then, will be complete, but its conclusion will be of being possible not to belong rather than not belonging. For that is also how the premise made from the major extreme was supposed, and it cannot be reduced to the impossible (for if A should be assumed to belong to some C and also put as possible to belong to no B, nothing impossible results through these). If the privative is put with the minor extreme, when it signifies being possible there will be a deduction through conversion, as in the previous cases; but when it signifies

not being possible, there will not be one; nor, again, when both are put as privative and the premise related to the minor extreme is not possible. The terms are the same: for belonging, white, animal, snow; for not belonging, white, animal, pitch.

It will be the same way for particular deductions. For when the privative premise is necessary, the conclusion will also assert not belonging. For example, if it is not possible that A belongs to any of the Bs[39] and possible that B belongs to some one of the Cs,[40] it is necessary for A not to belong to some one of the Cs.[41] For if it belongs to every one but is not possible to any B, neither is it possible for B to belong to any A. Consequently, if A belongs to every C, B is not possible to any of the Cs:[42] but it was assumed to be possible to some. And when the particular affirmative premise in the privative deduction (that is, BC) is necessary, or the universal premise in the positive deduction is (that is, AB), there will not be a deduction of belonging. (The demonstration is the same as that in the previous cases.) If the universal premise, whether affirmative or privative, is put as possible in relation to the minor extreme and the particular as necessary in relation to the major extreme,[43] there will not be a deduction. Terms for belonging of necessity are animal, white, human; for not being possible, animal, white, cloak. When the universal is necessary and the particular is possible, then, if the universal is privative, terms for belonging are animal, white, raven, and for not belonging, animal, white, pitch; but if it is affirmative, terms for belonging are animal, white, swan, and terms for not being possible are animal, white, snow. Nor when the premises are taken as indeterminate, or both as particular, will there be a deduction in this way either. Common terms for belonging are animal, white, human; for not belonging, animal, white, inanimate (for animal both necessarily belongs to something white and is not possible to something [else] white, and [similarly] white to something inanimate; and it is the same with being possible, so that the terms are usable for all the cases).

It is evident from what has been said, then, that both in the case of belonging and in the case of necessary things, a deduction either does or does not come about with the terms in the same relationships, except that when the privative premise is put as belonging, the deduction was of being possible, whereas if the privative was supposed in the sense of necessity the deduction was both of being possible and of not belonging. {It is also clear that all these deductions are incomplete and that they are completed through the figures that were mentioned.}[44]

39. Reading μηδενὶ τῶν B.
40. Reading τινὶ τῶν Γ.
41. Reading τινὶ τῶν Γ.
42. Reading οὐδενὶ τῶν Γ.
43. Retaining πρὸς τῷ μείζονι ἄκρῳ.
44. This sentence is identical to 39a1–3 and inconsistent with the results just proved, so its inclusion here is probably a copyist's error.

1.17
Second Figure: Two Possible Premises

In the second figure, when both premises suppose something being possible, there will be no deduction, whether they are put as positive or as privative, as universal or as particular. However, when one premise signifies belonging and the other signifies being possible, when it is the affirmative premise that signifies belonging, there will never be a deduction, but when it is a privative universal premise that does, there will always be one. And in the same way when one of the premises is supposed as necessary and the other as possible. (In these deductions also, one must take "possible" in the conclusions as in the previous cases.)

First, then, it must be proved that a privative premise that expresses being possible does not convert: that is, if A is possible to no B, it is not also necessary that B is possible to no A. For let this be supposed (that is, let it be possible that B belongs to no A). Then, since affirmations that express being possible convert with their negations (contraries as well as opposites), and it is possible for B to belong to no A, apparently it would also be possible for B to belong to every A. But this is false: for it is not the case that if it is possible that *this* belongs to every *that*, necessarily *that* is possible to every *this*. Consequently, the privative does not convert. Moreover, nothing prevents it being possible that A belongs to no B and yet B of necessity does not belong to some A, as, for example, it is possible for white to not belong to every human (for it may also belong), though it is not true to say that it is possible for human not to belong to anything white, for it of necessity does not belong to many of them, and what is necessary was not possible.

But neither can it be proved from the impossible that it converts, that is, if someone should claim: "Since 'It is possible for B to belong to no A' is false, 'It is not possible for B to belong to no A' is true (for they are an affirmation and its negation); and if this is true, it is true that B belongs of necessity to some one of the As.[45] Consequently, A also belongs of necessity to some one of the Bs.[46] But this is impossible." For it is not the case that if it is not possible for B to belong to no A, it is then necessary for it to belong to some. For "is not possible to no" is said in two ways: in one way if it belongs of necessity to some, and in the other way if it of necessity does not belong to some. For it is not true to say, of what of necessity does not belong to some one of the As, that it is possible for it not to belong to every one, just as it is not true either to say of what belongs of necessity to some that it is possible for it to belong to every. Therefore, if someone were to claim that since it is not possible for C to belong to every D, it of necessity does not belong to some, he would be supposing a falsehood. For [perhaps] it belongs to every one but, because it belongs to certain ones of necessity, we say, for this reason, that it is not possible for it to belong to every

45. Reading τινὶ τῶν A.
46. Reading τινὶ τῶν B.

one. Consequently, both "of necessity belongs to some" and "of necessity does not belong to some" are opposed to "possibly belongs to every" (and likewise opposite to "possibly belongs to no"). It is clear, then, that for an opposite of what is possible or not possible in the way we initially defined it, we must not only take "of necessity belongs to some" but also[47] "of necessity does not belong to some." But if this is supposed, nothing impossible results, so that no deduction comes about. It is evident from what has been said, then, that the privative premise does not convert.

With this established, let A be put as possible to no B and to every C. There will not then be a deduction through conversion (for it has been said that this sort of premise does not convert). But neither will there be one through the impossible. For if we suppose it is possible for B to belong to every C,[48] nothing false follows (for it would be possible for A to belong to every C as well as to none).

In general, if there is a deduction, clearly it would be of being possible because neither of the premises was supposed as belonging, and this deduction would be either affirmative or privative. But neither way is possible. For if we suppose the conclusion to be affirmative, it can be proved through terms that it is not possible for B to belong to C, whereas if we take it to be privative, the conclusion is not possible but instead necessary. For let A be white, B human, C stand for horse. Then it is possible for A (white) to belong to all of one and none of the other. But it is not possible for B either to belong or not to belong to C. That it is not possible for it to belong is evident, for no horse is a human. Yet neither is it possible for it not to belong: for it is necessary that no horse is a human, and the necessary was not possible. Therefore, no deduction comes about.

It can also be proved similarly if the privative is put the other way around, or if both premises are supposed as affirmative or privative (for the demonstration will be through the same terms), or when one premise is universal and the other particular, or both premises are particular or indeterminate, or in whatever other ways it is possible to alter the premises (for the demonstration will always be through the same terms). It is evident, then, that when both premises are supposed as possible, no deduction comes about.

1.18
Second Figure: One Possible and One Non-modal Premise

If one premise signifies belonging and the other signifies being possible, there will never be a deduction if the positive premise is put as belonging and the privative premise as being possible, whether the terms are supposed as universal or as particular (the demonstration is the same and through the same terms). But when

47. Reading οὐ μόνον . . . ἀλλὰ καὶ.
48. Reading τοῦ Β παντὶ τῷ Γ ἐνδέχεσθαι ὑπάρχειν.

the affirmative premise signifies being possible and the privative premise signifies belonging, there will be a deduction. For let A be supposed to belong to no B and to be possible to every C. Then, when the privative premise is converted, B will belong to no A. But A was possible to every C, so a deduction that it is possible for B to belong to no C comes about through the first figure. And similarly if the privative is put with C.

But if both premises are privative and one signifies not belonging and the other being possible, nothing necessary follows through the premises taken themselves, but when the premise in the sense of possibility is converted, a deduction that it is possible for B to belong to no C comes about, as in the previous cases (for it will again be the first figure). But if both premises are put as positive, there will not be a deduction. Terms for belonging are health, animal, human; terms for not belonging are health, horse, human.

The situation will be the same in the case of the particular deductions. For when the affirmative premise is supposed as belonging (whether taken as universal or particular), there will be no deduction (this is proved similarly to the previous cases and through the same terms); but when it is the privative premise, there will be a deduction through conversion, as in the previous cases. Next, if both intervals are supposed as privative and the one of not belonging is universal, nothing will result necessarily from the premises themselves, but when "is possible" is converted in the same way as in the previous cases, there will be a deduction. And if the privative is belonging and is supposed as particular, there will not be a deduction, no matter whether the other premise is affirmative or privative. Nor when both premises are taken as indeterminate (whether affirmative or negative) or as particular. The demonstration is the same and through the same terms.

1.19
Second Figure: One Necessary and One Possible Premise

If one of the premises signifies belonging of necessity and the other premise signifies being possible, when it is the privative premise that is necessary there will be a deduction, not only that it is possible for something not to belong, but also that it does not belong; but when it is the affirmative premise, there will not be a deduction.

For let A be supposed to belong of necessity to no B and to be possible to every C. Then when the privative premise is converted, neither will B belong to any A. But A was possible to every C, so a deduction that it is possible for B to belong to no C comes about again through the first figure. At the same time, it is clear that B will also not belong to any of the Cs.[49] For suppose it does belong. Then, if A is possible to no B and B belongs to some one of the Cs, A will not be possible to some one of

49. Reading τῶν Γ.

the Cs.[50] But it was assumed that it is possible for it to belong to them all. It can be proved in the same way if the privative is put with C.

Next, let the positive premise be necessary and the other premise possible, and let A be possible to no B, but let A belong of necessity to every C. When the terms are related like this, there will be no deduction, for it may happen that B of necessity does not belong to C. For let A be white, B stand for human, C stand for swan. Then white belongs to swan of necessity and is possible to no human, and human belongs to no swan of necessity. It is evident, then, that there is no deduction of being possible, for what is of necessity was[51] not possible. But neither is there a deduction of a necessary conclusion; for a necessary one followed either from both premises being necessary or from the privative premise being so. Moreover, it is possible when these things are supposed for B to belong to C. For nothing prevents C being below B and A being possible to every B and belonging of necessity to C, as, for example, if C is awake, B is animal, and A stands for movement: for movement belongs of necessity to what is awake and is possible to every animal, and everything awake is an animal. It is evident, then, that neither is there a deduction of not belonging, given that when the terms are like this it is necessary for B to belong to C. But neither is there a deduction of the opposite affirmations. Consequently, there will be no deduction. It can be proved similarly if the affirmative premise is put the other way around.

If the premises are the same in form, when they are privative there will always be a deduction when the premise expressing possibility is converted, as in the previous cases. For let A be supposed not to belong to B of necessity and possibly not to belong to C. Then, when the premises arc converted, B belongs to no A and A is possible to every C, so it becomes the first figure. Likewise, if the privative is put in relation to C. However, if positive premises are supposed, there will not be a deduction. For it is evident that there will not be one of not belonging or of not belonging of necessity, because a privative premise was not supposed, either as expressing belonging or as expressing belonging of necessity. But neither will there be a deduction of possibly not belonging. For with the terms in this relationship, B may of necessity not belong to C (for example, if A is put as white, B stands for swan, C is human). Yet neither will there be a deduction of the opposite affirmations, since B has been proved as of necessity not belonging to C. Therefore, no deduction comes about at all.

It will be likewise in the case of the particular deductions. For whenever the negative premise is both universal and necessary, there will always be a deduction both of being possible and of not belonging (the demonstration is through conversion); but when it is the affirmative premise, there never will be one. For this can be proved in the same way as in the case of the universal deductions and through the same terms. Nor when both premises are taken as affirmatives (for the demonstration of this is also the same one as before). But when both premises are privative and the one

50. Reading τινὶ τῶν Γ twice.
51. 32a18–20, 32a36.

signifying not belonging is both universal and necessary, a necessary result will not come about by means of the premises taken themselves, but there will be a deduction when the premise expressing being possible is converted, as in the previous cases. And if both premises are put as indeterminate or as particular, there will not be a deduction (the demonstration is the same and through the same terms).

It is evident from what has been said, then, that when the privative universal premise is supposed as necessary, a deduction always comes about not only of being possible not to belong but also of not belonging, but that a deduction never comes about when the affirmative premise is put as necessary. It is also evident that deductions both do and do not result with the terms in the same relationships in the case of necessary premises as in the case of premises of belonging. It is also clear that all these deductions are incomplete and that they are completed through the figures that were mentioned.

1.20
Third Figure: Two Possible Premises

In the last figure, there will be a deduction when both premises are possible and also when only one of them is. When the premises signify being possible, then, the conclusion will also be possible, and also when one premise signifies being possible and the other signifies belonging. However, when one premise is supposed as necessary, if it is affirmative the conclusion will not be either necessary or belonging, but if it is privative there will be a deduction of not belonging as in the previous cases. In these deductions as well, we must understand "possible" in the conclusions in the same way.

Let the premises first be possible, then, and let it be possible that both A and B belong to every C. Then, since the affirmative premise converts in part and B is possible to every C, C will also be possible to some B. Consequently, if A is possible to every one of the Cs[52] and C to some B, it is also necessary for A to be possible to some one of the Bs[53] (for it becomes the first figure). And if it is possible that A belongs to no C and B belongs to every C, it is necessary for it to be possible that A does not belong to some B (for it will be the first figure again through conversion). If both premises are put as privative, there will be no necessary result from the premises taken themselves, but there will be a deduction when the premises have been converted, as in the previous cases. For if it is possible that both A and B do not belong to C, if "is possible to belong" is substituted, it will again be the first figure through conversion.

And if one of the terms is universal and the other is particular, there will either be, or fail to be, a deduction when the terms are in the same relationship as in the case

52. Reading παντὶ τῶν Γ.
53. Reading τινὶ τῶν Β.

of belonging. For let A be possible to every C and B to some C. Then it will be the first figure again if the particular premise is converted. For if A is possible to every C and C to some one of the Bs, A is possible to some B. And if the universal is put with BC, likewise. And similarly if AC should be privative and BC affirmative (for it will again be the first figure through conversion). But if both premises are put as privative, one as universal and the other as particular, there will not be a deduction through the premises taken themselves, but when they are converted there will be, as in the previous cases. But when both premises are taken as indeterminate or as particular, there will not be a deduction. For A can be necessary both to every and also to no B: terms for belonging are animal, human, white; for not belonging, horse, human, white (white is the middle term).

1.21
Third Figure: One Possible and One Non-modal Premise

If one of the premises signifies belonging and the other signifies being possible, the conclusion will be that it is possible, not that it belongs, and there will be a deduction when the terms are in the same relationships as in the previous cases. First let the terms be positive, and let A belong to every C, but let it be possible that B belongs to every C. Then, when BC is converted, it will be the first figure, and the conclusion will be that it is possible that A belongs to some one of the Bs.[54] For when one or the other of the premises in the first figure signifies being possible, the conclusion was[55] also possible. Similarly, if BC signifies belonging and AC signifies being possible, or if AC is privative and BC positive (and either one is belonging), in both ways the conclusion will be possible. For it becomes the first figure again, and it was proved that in it, if one or the other premise signifies being possible, the conclusion will also be possible. But if the privative is put in relation to the minor extreme, or again if both premises should be taken as privative, there will not be a deduction through the assumptions themselves, but there will be one when they have been converted, as in the previous cases.

If one of the premises is universal and the other is particular, when both premises are positive, or when the universal premise is privative and the particular premise is affirmative, there will be deductions in the same way. For they all come to a conclusion through the first figure; consequently, it is evident that the deduction will be of being possible and not of belonging. But if the affirmative premise is universal and the privative premise is particular, the demonstration will be through the impossible. For let B belong to every C, and let it be possible that A does not belong to some C. Thus, it is necessary for A to be possible not to belong to some B. For if A belongs of

54. Reading τινὶ τῶν B.
55. 1.15.

necessity to every B and B is put as belonging to every C, A will belong to every C of necessity (for this was proved earlier): but it was assumed to be possible for A not to belong to some C.

When both premises are taken as indeterminate or as particular, there will not be a deduction. The demonstration is the same as in the previous cases and through the same terms. **40^a1**

1.22
Third Figure: One Necessary and One Possible Premise

If one of the premises is necessary and the other is possible, when the terms are positive there will always be a deduction of being possible. But when one is positive and the other privative, if the affirmative is necessary, the deduction will be of being possible not to belong, while if the privative is necessary, it will be both of being possible to belong and of not belonging. But there will not be a deduction of not belonging of necessity, just as there was not one in the other figures.

First, then, let the terms be positive, and let A belong to every C of necessity, but let B be possible to every C. Then, since it is necessary that A belongs to every C and C is possible to some B, "A to some B" will also be possible (not belonging): for that is the way it happened in the case of the first figure. If BC is put as necessary and AC as possible, it will be proved similarly. Next, let one term be positive, the other privative, and the positive necessary, that is, let it be possible that A belongs to no C, and let B belong to every C of necessity. It will then be the first figure again. For since the privative premise signifies being possible, it is therefore evident that the conclusion will be possible: for when the premises are like this in the first figure, the conclusion was also possible. But if the privative premise is necessary, the conclusion will be both that it is possible not to belong to some and that it does not belong. For let A be put as not belonging to C of necessity, and let B be possible to every C. Then, when the affirmative BC is converted, it will be the first figure, and the privative premise will be necessary. And when the premises are like this, it turned out[56] both that it is possible for A not to belong to some C and that it does not belong, so that it is also necessary that A does not belong to some B. But when the privative is put in relation to the minor extreme, then, if it is possible, there will be a deduction when the premise is substituted as in the previous cases. But if it is necessary, there will not be a deduction; for it [may] both belong necessarily to all and also be possible to belong to none. Terms for belonging to all are sleep, sleeping horse, human; for belonging to none, sleep, waking horse, human.

It will be similar if one of the terms is universal and the other particular in relation to the middle. For when both are affirmative, there will be a deduction of

56. 36^a17–25.

40ᵇ1 being possible but not of belonging, and also when one is taken as privative and the other as affirmative and the affirmative is necessary. But when the privative is necessary, the conclusion will also be one of not belonging. For the way of proving them will be the same whether the terms are universal or not universal. For it is necessary to complete the deductions through the first figure, and so it necessarily happens the same way in these cases as it did in those. But when the privative premise is taken as universal in relation to the minor extreme, if this premise is possible there will be a deduction through conversion, but if it is necessary there will not be. This will be proved in the same way as in the universal cases and through the same terms.

It is evident, then, both when and how there will be a deduction in this figure, and when it will be of being possible and when of belonging. It is clear too that the deductions are all incomplete and that they are completed through the first figure.

1.23
All Deductions Whatever Can Be Reduced to the First Figure

It is clear from what has been said, then, that the deductions in these figures are both completed through the universal deductions in the first figure and reduced to them. But it will now be evident that this holds for all deductions unconditionally when it has been proved that all of them come about through one of these figures.

Every demonstration and every deduction must prove something either to belong or not to belong, and this either universally or particularly, and in addition either probatively or from a hypothesis (for deduction through the impossible is a part of deduction from an assumption). First, then, let us discuss probative cases, for when these have been proved, the result will also be evident both for those that reduce to the impossible and generally for those from a hypothesis.

If someone must deduce A of B, either as belonging or as not belonging, it is necessary to suppose something of something. If A is taken of B, then that will be supposing the initial thing. But if A is supposed of C, and C of nothing nor anything else of it, nor some other thing of A, there will be no deduction, for nothing results of necessity in virtue of one single thing having been supposed of another. Consequently, another premise must be supposed in addition. If A is then supposed of something else, or something else of it or of C, nothing prevents there being a deduction, but it will not be in relation to B through the premises taken. Nor when C is supposed to belong to something else, that to another thing, and this to something else, but it does not connect to B: there will not be a deduction
41ᵃ1 in relation to B in this way either. For we said that in general, it is never possible to deduce one thing of another without some middle term having been supposed

which is related in some way to each according to the sorts of predications.[57] For a deduction, unconditionally, is from premises; a deduction in relation to this term is from premises in relation to this term; and a deduction of this term in relation to that is through premises of this term in relation to that. And it is impossible to take a premise in relation to B without either predicating or denying anything of it, or again to get a deduction of A in relation to B without taking any common term, but just predicating or denying certain things separately of each of them. As a result, something must be taken as a middle term for both that will connect the predications, if there is actually to be a deduction of this term in relation to that. Therefore, if it is necessary to suppose some common term in relation to both, and if this is possible in three ways—that is, by predicating A of C and C of B, or C of both A and B, or both A and B of C—and these ways are the figures we said, it is evident that every deduction must come about through some one of these figures. (The argument will be the same if A connects with B through more things: for the figure will be the same even in the case of many terms.)

It is evident, then, that probative deductions are brought to a conclusion through the figures stated previously. But that this holds for deductions reducing to the impossible as well will be clear through these next considerations. For all those that come to a conclusion through the impossible *deduce* the falsehood but *prove* the initial thing from a hypothesis, when something impossible results from assuming its contradictory—for example, proving that the diagonal is incommensurable because if it is assumed to be commensurable, odd numbers become equal to even ones. It *deduces* that odd numbers become equal to even ones, then, but it *proves* that the diagonal is incommensurable from a hypothesis, since a falsehood follows because of its contradictory. For this is what was meant[58] by "deducing through the impossible": proving something impossible through the initial hypothesis. Consequently, since a probative deduction of the falsehood comes about in those cases that reduce to the impossible (while the initial thing is proved from a hypothesis), and we said earlier that probative deductions are brought to a conclusion through these figures, it is evident that deductions through the impossible will also be through these figures. And likewise for all the other sorts of deduction from an assumption. For in all of them, the deduction is in relation to the substituted proposition, and the initial thing is concluded through an agreement or some other sort of hypothesis. But if this is true, every demonstration and every deduction must necessarily come about through the three figures mentioned previously. With this proved, it is clear that every deduction is both brought to completion through the first figure and reduced to the universal deductions in it.

57. I.e., to every, no, some, or not to some.

58. Not defined previously in *APr.*, but see 2.11.

1.24
Some General Results about Deductions

Moreover, in every deduction one of the terms must be positive and there must be a universal. For without a universal, either there will not be a deduction, or it will not be in relation to what was proposed, or it will be asking for the initial thing.[59] For let it be proposed [to prove] that musical pleasure is excellent. Then, if someone should claim "pleasure is excellent," without adding "every," there will not be a deduction. But if he should claim "some pleasure is excellent," then if it is another pleasure, that is nothing in relation to what was proposed, whereas if it is this very pleasure, he is taking the initial thing.

This becomes more evident in geometrical proofs—for example, the proof that the angles at the base of an isosceles triangle are equal. Let the lines AB be drawn toward the center. Then, if someone should suppose angle AC to be equal to angle BD without claiming that in general the angles of semicircles are equal, or next that C is equal to D without supposing this in addition for every angle of a segment, or in addition supposes "if equal angles are taken away from the whole angles, which are equal, the remainders E and F are equal," without taking equal things to remain when equals are subtracted from equals, he will be asking for the initial thing.

It is evident, then, that every deduction must include belonging universally, and also that the universal is proved from all the terms being universal, while the particular is proved both in this way and in the other way. As a result, if the conclusion is universal the terms must also be universal, while if the terms are universal it is possible for the conclusion not to be universal. It is also clear that in every deduction either both premises or one of them must be like the conclusion (I mean not only with respect to being affirmative or privative, but also with respect to being necessary or belonging or being possible). The other sorts of predications must also be examined.

It is evident, then, both when there will unconditionally be or not be a deduction, and when it will be potential and when perfect, and also that if there is a deduction it is necessary for the terms to be related in accord with one of the ways we said.

1.25
Further Results about Extended Deductions

It is also clear that every demonstration will be through three terms, and no more, unless the same conclusion comes about through different pairs of premises—for example, E through A and B and also through C and D, or through A and B and also through A, C, and D (for nothing prevents there being several middles for the same terms; but when there are, there is not one deduction but several), or again when

59. Explained in 2.15.

each one of A and B is obtained through a deduction—for example, A through DE and next B through FG, or one through induction and the other through deduction. (But in this way also the deductions are more than one, for the conclusions are more than one—that is, A, B, and C.) If, therefore, this is not many deductions but one, then it is possible in this way for the same conclusion to come about through more [than three] terms. However, it is impossible for this to happen in the way that C results through A and B. For suppose that E has been concluded from ABCD, then some one of them must necessarily have been supposed in relation to another term, one as whole and the other as part (for this was proved earlier,[60] that is, that if there is a deduction, it is necessary for some of the terms to be related in this way). Then let A be so related to B. Therefore, there is some conclusion from them. It will be either E, or one of CD, or something else besides these. But if it is E, the deduction would be from A and B alone. And if C and D are so related as to be one a whole and the other a part, there will also be some conclusion from them, and it will be either E or one of A and B or something else besides these. If it is E or one of A and B, either there will be several deductions, or it will follow in the way it was possible for the same thing to be concluded through multiple terms. But if it is something else besides these, the deductions will be multiple and not connected to each other. And if C is not so related to D as to make a deduction, these premises will have been taken to no purpose (unless for the sake of induction, or concealment, or something else of that sort). **42a1**

If instead of E some other conclusion comes about from A and B, and if the conclusion from C and D is either one or the other of these or something else besides them, the deductions become both many and not of the underlying subject (for the deduction was assumed to be of [conclusion] E). And if no conclusion comes about from C and D, it results both that they were assumed to no purpose and that the deduction is not of the initial thing. So it is evident that every demonstration and every deduction will be through only three terms.

And since this is evident, it is clear that it will also be from two premises and no more (for three terms are two premises), unless something should be supposed in addition for the purpose of completing the deductions, as was said in our initial remarks.[61] It is evident, then, that if the premises in a deductive argument through which the principal conclusion results are not even in number (for some of the upper conclusions are necessarily premises) then that argument either has not deduced or has asked for more things than are necessary in relation to the proposition.

Counting deductions by their principal premises, then, every deduction will be from an even number of premises and an odd number of terms (for the terms are one more in number than the premises). Also, the conclusions will be half as many as the premises. And when the conclusion is reached through prior deductions or through **42b1**

60. 1.23.
61. $24^{b}22–26$.

several continuous middle terms (for example, if premise AB is concluded through terms CD), the number of terms will likewise exceed the premises by one (for the term inserted will be put either outside or in the middle [of the interval], but in both ways it results that the intervals are one fewer than the terms, and the premises are equal in number to the intervals). However, the premises will not always be even and the terms odd, but in alternation: when the premises are even, the terms will be odd, and when the terms are even, the premises will be odd. For a single premise is added at the same time as a term, no matter from what side the term may be added, so that since the premises were even and the terms odd, this will necessarily alternate when the same addition has been made. But the conclusions will no longer be ordered in the same way either with respect to the terms or with respect to the premises. For when one term is added, conclusions will be added one fewer in number than the terms which were already present: for only in relation to the last term does it fail to produce a conclusion, while it produces one in relation to all the rest. For example, if D is added to ABC, two conclusions are added immediately, one in relation to A and one in relation to B (and similarly in the other cases). It will also be the same way if the term is inserted in the middle (for it will only fail to produce a deduction in relation to one of them). Consequently, the conclusions will be much greater in number than either the terms or the premises.

1.26
Which Problems Are Easiest to Prove and Which Hardest

Since we now know what deductions are about, and what sort of problem is proved in each figure and in how many ways, it is also evident to us what sort of problem is difficult and what sort easy to attack. For what is concluded in more figures and through more inflections[62] is easier to attack, and what is concluded in fewer figures and by means of fewer cases more difficult. The affirmative universal, then, is proved through the first figure alone, and through it in only one way. The privative universal is proved both through the first figure and through the middle (through the first in one way, through the middle in two). The particular affirmative is proved through the first and through the last (in one way through the first and in three ways through the last). The privative particular is proved in all the figures: in the first figure it is proved in one way, while in the middle and in the last figures it is proved in two ways and in three, respectively.

43a1 It is evident, then, that the universal positive is most difficult to establish but easiest to disestablish. And in general, a universal is easier to do away with than a particular. For if it either belongs to none or does not belong to some, it has been

62. Here and at 43a10, 42b30, 49a2, and 94a12 an "inflection" (*ptôsis*) is a particular form (or "mood") of deduction.

done away with; and of these, not belonging to some is proved in all the figures, while belonging to none is proved in two of them. And it is the same way for the privatives; for if it belongs either to every or to some, the initial problem has been done away with, and this was proved in two figures. But in the case of the particulars, the problem is done away with only in one way, that is, by proving to belong either to all or to none.

But in establishing, the particular problems are easier, for they are proved in more figures and through more inflections.[63] And in general, it must not be overlooked that it is possible to do away with the problems through each other, that is, both universals through particulars and particulars through universals, but that it is not possible to establish universals through particulars, although it is possible to establish the latter through the former (but at the same time it is clear that it is easier to disestablish than to establish).

From what has been said, then, it is clear how every deduction comes about, both through how many terms and premises and how they are related to each other, and furthermore what sort of problem is proved in each figure, and what sort in more and what in fewer figures.

1.27
How to Find Deductions: Selecting Premises

Now it is time to explain how we may ourselves always be well supplied with deductions about whatever is proposed, and the route by which we can obtain the starting-points concerning any subject. For surely we should not only observe how deductions come about, but also to have the capacity to produce them.

Among all the things that are, some are such as not to be predicated truly and universally of anything else (for example, Cleon and Callias and what is particular and perceptible) but to have other things predicated of them (for each of these is both a human and an animal); some are themselves predicated of others but do not have other prior things predicated of them; and some are both predicated of others and have others predicated of them (for example, human is predicated of Callias and animal of a human).

So then, among all the beings, some are not of such a nature as to be said of anything is clear; for each perceptible object is pretty much the sort of thing that cannot be predicated of anything except coincidentally (for we do sometimes say that this white thing is Socrates, or that what is approaching is Callias). And that it also comes to a stop at some point proceeding in the upward direction we will explain later:[64] for the present, let this be supposed. Of these things, then, it is not possible to

63. Reading πτώσεων.
64. 1.15, 1.22.

demonstrate that anything else is predicated (except in accord with belief), but they are predicated of others. Neither can particulars be predicated of other things, but instead other things are predicated of them. But it is clear that for those in between, predication is possible in both ways (for they can be said of other things, and other things can also be said of them). And arguments and inquiries are probably always concerned mostly with these things.

43b1 So, we must select the premises about any subject in this way: first, assume the subject itself (its definitions, and also what is special to it); next, after this, whatever follows the subject; next, whatever the subject follows; and then, whatever cannot belong to it. (Those to which it is not possible for the subject to belong need not be selected, because the privative converts.) The terms that follow the subject must also be divided into those predicated of it in the what-it-is, those special to it, and those predicated coincidentally, and of these, also, which are in accord with belief and which are in accord with the truth. For the more such terms one is supplied with, the more quickly hit on a conclusion, while to the extent that one is supplied with more that is true, the more will one demonstrate.

We must select those things that follow the subject as a whole, not those that follow some of it (for example, not what follows some human, but what follows every human); for a deduction is through universal premises. So then, when a premise is indeterminate, it is unclear whether it is universal, whereas if it is determinate this is evident. Similarly, we must select what the subject follows as a whole for the reason stated. However, we must not take what follows to follow as a whole (I mean, for example, taking every animal to follow human or every science to follow music), but only to follow unconditionally, in the same way that we also propose premises. For the other way—for example, that every human is every animal or justice is every good, is both useless and impossible. Instead, it is what the subject follows that "every" should be put with.

When the subject for which one needs to select the things that follow is contained under something, those following or not following that [containing] universal need not be selected for inclusion in these (for they were already included in the former terms: for whatever follows animal also follows human, and likewise for those which do not belong). But those that are special concerning each subject should be taken. For there are certain things special to a form besides its kind, since it is necessary for some special affections to belong to each of the various forms. Nor, again, should what the contained term follows be selected for the [containing] universal—for example, taking what human follows in the selection for animal (for if animal follows human, it is necessary for it to follow all of these, but they are more appropriate to the selection for human). Those things that follow or are followed for the most part should also be taken. For deductions of problems that are for the most part are also from premises that are for the most part (either all or some of them); for the conclusion of each deduction is like its starting-points. In addition, those that follow

everything should not be selected, for there will not be a deduction from them (the cause of this will be clear in what follows).

1.28
Finding Premises from Which to Deduce a Given Conclusion

If we want to establish something of some whole, we should look at the subject terms that the predicate to be established is said of and those that follow the term that this term is to be predicated of. For if there is something the same in these groups, the one term must belong to the other. If we need to establish, not that it belongs to every, but that it belongs to some, we must look at those that each term follows. For if something in these groups is the same, it is necessary that it belongs to some. When we need [to prove] belonging to none, then regarding the term that the predicate must be proved not to belong to, we must look at the things that follow it and, regarding the term that needs not to belong to it, we must look at the things that cannot be present in it; or, the other way around, regarding the term that the predicate must be proved not to belong to, we must look at the things that cannot be present in it, and, regarding the term that needs not to belong, we must look at the things that follow it. For if either of these is the same, it will not be possible that the one term belongs to any of the other. (Sometimes a deduction in the first figure comes about, sometimes one in the middle figure.) And to prove not belonging to some, regarding the term that the predicate must be proved not to belong to, we must look at the things that follow it, and regarding the term that needs to not belong, we must look at the things that cannot be present in it. For if some one of these is the same, it is necessary that [the predicate] proposed does not belong to some [of the subject].

Perhaps each of these statements will be clearer in the following way. Let B stand for those that follow A, let C stand for those that A follows, and let D stand for those that cannot belong to A. Next, let F stand for those that belong to E, G stand for those it follows, and H for those that cannot belong to it. Accordingly, if one of the Cs should be the same as one of the Fs, it is necessary for A to belong to every E (for F belongs to every E and A to every C, so that A belongs to every E). But if a C and a G are the same, it is necessary for A to belong to some one of the Es[65] (for A follows every C and E follows every G). And if an F and a D are the same, A will belong to none of the Es, from a preparatory deduction (for since the negative converts and the F is the same as the D, A will not belong to any of the Fs, but F belongs to every E). Next, if a B and an H are the same, A will belong to none of the Es (for the B will belong to every A but to none of what E stands for: for the B was the same as the H, and the H belonged to none of the Es). And if a D and a G are the same, A will not belong to some one of the Es (for it will not belong to the G, because it does not

65. Reading τινὶ τῶν E.

belong to the D either; but the G is below E, so that it will not belong to some one of the Es[66]). But if a B is the same as a G, there will be a converted deduction. For E will belong to every A (for the B will belong to A, and E to the B, since it was the same as the G); and though it is not necessary that A belongs to every E, it is necessary for it to belong to some, because the universal predication converts into a particular. It is evident, then, that with respect to each problem one must look at what was previously said for each of its terms (for all the deductions are through these).

In addition, among both those things which follow each term and those which are followed by it, one must look at those that are primary and most universal. For example, when it comes to E, one must look at KF rather than F alone. Or, when it comes to A, one must look at KC rather than C alone. For if A belongs to KF, it also belongs to F and to E, whereas if it does not follow the latter, it still is possible for it to follow F. Those that the subject itself follows must be examined in the same way. For if something follows the first terms, it follows those below them, although if it does not follow the latter, it is still possible for it to follow those below the former.

It is also clear that the inquiry is through the three terms and the two premises, and that all the deductions are through the figures said previously. For A is proved to belong to every E when we get some same term from among the Cs and the Fs. But this will be the middle term, and A and E the extremes; therefore, it becomes the first figure. A is proved to belong to some E when we get a C and a G that are the same. But this is the last figure; for the G becomes the middle term. A [is proved to belong] to no E when we get a D and an F that are the same. But in this way, both the first figure and the middle come about: the first because A belongs to no F (since the privative converts) and F belongs to every E, and the middle because the D belongs to no A and to every E. And [A is proved] not to belong to some E when a D and G are the same. But this is the last figure; for A will belong to no G and E to every G. It is evident, then, that all the deductions are through the figures we said previously, and also that we need not select terms that follow everything because no deduction comes about from them. For it was overall not possible to establish just from what follows something, and it is not possible to refute by means of what follows everything (for it must belong to one and not belong to the other).

It is also evident that the other inquiries that are in accord with these selections are useless for producing a deduction—that is, whether terms following each are the same, or whether terms A follows are the same as those that are not possible to belong to E, or next whether terms that cannot belong to each term are the same. For no deduction comes about through these. For if terms that follow each term are the same—that is, a B and an F—it will become the middle figure with the premises positive; if terms that A follows are the same as terms that are not possible to E—that is, a C and an H—it will be the first figure with the premise related to the minor extreme privative; and if terms that cannot possibly belong to each are the same—that is, a D

66. Reading τινὶ τῶν E.

and an H—both premises will be privative, either in the first or in the middle figure. But in none of these ways is there a deduction.

It is also clear that we must take terms that are the same, not terms that are different or contrary, as the terms selected for the investigation. This is so in the first place because the examination is for the sake of a middle term, and we must take as middle something the same, not something different. Moreover, those cases in which a deduction does result, through taking contraries or terms that cannot belong to the same thing, can all be reduced to the ways previously said. For example, suppose a B and an F are contraries or that it is not possible for them to belong to the same thing. If we get these, there will be a deduction that A belongs to none of the Es. However, it will not be from these terms themselves, but rather from the way said previously. That is, B will belong to every A and to no E, so that B must be the same as some one of the Hs.[67]

{Next, if it is not possible for a B and a G to be present in the same thing, [there will be a deduction] that A will not belong to some one of the Es.[68] For in this way also it will be the middle figure. For B will belong to every A, but to no E, so that it is necessary for the B to be the same as some one of the Hs: for there is no difference between it not being possible for a B and a G to belong to the same thing and the B being the same as some one of the Hs, since everything that cannot belong to E was taken.}[69]

It is evident, then, that no deduction comes from these inspections themselves. However, if a B and an F are contraries, the B must be the same as some one of the Hs, and the deduction must come about through these terms. The result, then, is that those who examine in this way are carrying out a superfluous examination through a different route from the one needed, because they overlook the identity of the Bs and the Hs.

1.29
Deduction by Deduction to the Impossible

The circumstances concerning deductions by reducing to the impossible are the same as for probative ones. For they too come about through what each term follows or is followed by, and the same inquiry applies in both. For whatever is proved probatively can also be deduced through the impossible through the same terms, and whatever is proved through an impossibility can also be deduced probatively—for example, that A belongs to none of the Es.[70] For suppose it belongs to some. Then, since B belongs

67. Reading τινὶ τῶν Θ.
68. Reading τινὶ τῶν Ε.
69. Secluded as a confused later addition.
70. Reading οὐδενὶ τῶν Ε.

to every A and A to some one of the Es,[71] B will belong to some one of the Es: but it belonged to none. Next, [a proof] that it belongs to some. For if A belongs to none of the Es and E to all of the Gs,[72] A will belong to none of the Gs: but it belonged to them all. Similarly, also for the other problems: for always and in every case, the proof through the impossible will be from what each of the terms follows or is followed by.

And the inquiry is the same, with respect to each problem, whether we intend to deduce probatively or reduce to the impossible. For both demonstrations are made from the same terms. For example, if A has been proved to belong to no E because it follows that B also belongs to some one of the Es,[73] and this is precisely what is impossible: if B is taken to belong to no E and to every A, it is evident that A will belong to no E. Next, if it has been deduced probatively that A belongs to no E, by assuming that it belongs to some, it will be proved to belong to none through the impossible. And it is similar in the other cases. For in them all, it is necessary to take some common term different from those assumed which the deduction of the falsehood will be in relation to; consequently, if this premise is converted while the other premise remains the same, the deduction will be probative through the same terms. For the probative deduction differs from the one to the impossible because in the probative deduction both the premises are supposed in accord with the truth, whereas in the deduction to the impossible one premise is supposed falsely.

These things will be more evident in the course of the following remarks, when we come to discuss proof through the impossible, but for now let this much be clear to us: that one must look at the same things whether one wants to deduce probatively or to lead to the impossible. In other deductions from a hypothesis, for example, those according to substitution or according to quality, the inquiry will be conducted concerning the terms assumed—not the initial ones, but those substituted—and the manner of the examination will be the same. (We need to examine this further and divide up the different ways of deducing from a hypothesis.)

Each of the problems is proved in this way, then, but there is also another way to deduce some of them—for example, deducing universals from a hypothesis through the examination of a particular. For if a C and a G were the same and E should be supposed to belong only to Gs, A would belong to every E. Again, if a D and a G are the same and E should be predicated only of Gs, it follows that A will belong to none of the Es.[74] It is evident, then, that we should also look over the terms in this way.

And it is the same way in the case of the necessary and the possible, for the way of inquiry is the same, and the deduction of being possible will be through terms arranged in the same way as for the deduction of belonging. But in the case of possible propositions, we must also select the terms that do not belong but are capable[75]

71. Reading τινὶ τῶν E.
72. Reading μηδενὶ τῶν E . . . παντὶ τῶν H.
73. Reading τινὶ τῶν E.
74. Reading οὐδενὶ τῶν E.
75. *Dunaton* (as at 34a5–33).

of belonging (for it was proved that a deduction of being possible also comes about through these). Similarly for the other sorts of predication.

It is evident from what has been said, then, not only that it is possible for all deductions to come about through this route, but also that this is impossible through any other. For every deduction has been proved to come about through one of the figures previously mentioned, and these cannot be constructed except through what each term follows or is followed by: the premises and the selection of a middle are from these, so that it is not even possible for a deduction to come about through others.

1.30
This Method Is the Universal Method for Any Subject

The route is the same with respect to all things, then, whether concerning philosophy or concerning any sort of craft or learning whatever. For we must discern what belongs to each term and what it belongs to, and be supplied with as many of them as possible, and examine these through the three terms, disestablishing in this way and establishing in that; according to truth, from terms that have been cataloged as belonging in accord with truth, but in dialectical deductions from premises that are in accord with belief.

The starting-points of deductions have been described universally—both what they are like and how we should hunt for them—in order that we might not look to everything that is said of something or inspect the same things when establishing as when disestablishing, or the same things when establishing something to belong to all as to some, or when disestablishing a predicate of all as of some, but rather that we should look to fewer and determinate things, and that we should make a selection concerning each thing that is (for example, concerning the good or science).

The majority of the starting-points of each science are special to it. That is why it is the role of our experience to deliver to us the starting-points concerning any given subject. I mean, for example, that it is astronomical experience that delivers the starting-points of astronomical science (for when the appearances had been sufficiently grasped in this way, astronomical demonstrations were found), and similarly concerning any other craft or science whatever. Consequently, once the facts concerning any subject have been grasped, it is then already within our grasp to bring the demonstrations readily to light. For if nothing that truly belongs to the things has been left out of our recorded cases, then concerning every case, if a demonstration for it exists, we will be able to find that demonstration and demonstrate it, while if it does not naturally have a demonstration, we will be able to make that evident.

The way we should select premises has been sufficiently explained in general, then. We have gone through this in exact detail, however, in our study concerning dialectic.[76]

1.31
Comparison with the Method of Division

It is easy to see that division through kinds is only a small part of the methodical inquiry that has been described. For division is a sort of weak deduction: it asks for what needs to be proved and always deduces one of the things higher up. But to begin with, this very point had been overlooked by all those who made use of it, and they used to try to persuade us that it is possible for there to be a demonstration concerning substance and the what-it-is. Consequently, they understood neither what it is possible to deduce by dividing nor that it was possible to deduce in the way we have said. In demonstrations, when we must deduce something to belong, the middle term through which the deduction comes about must always be both less than the first of the extremes and not universal of it. Division, however, means just the opposite: it takes the universal as a middle term. For example, let A stand for animal, B stand for mortal, and C stand for immortal, and let D stand for human, the definition of which we must get. Division then supposes that every animal is either mortal or immortal, which is to take everything that is A to be either B or C. Next, as the division continues, it takes a human to be an animal, so that it takes A to belong to D. The deduction, then, is that every D will be either B or C, so that it is necessary that a human is either mortal or immortal. To be a mortal animal, however, is not necessary but instead is taken as a posit: yet this is what it was required to deduce. Next, putting A to be mortal animal, B to stand for footed, C to stand for footless, and D human, the person dividing likewise supposes that A is either in B or in C (for every mortal animal is either footed or footless), and that A is predicated of D (that is, it supposes human to be a mortal animal), so that it is necessary that a human is either a footed or a footless animal. But to be footed is not necessary, and instead he supposes this: but that was again what it was required to prove. So it results that those who keep dividing in this way always take the universal—that is, the subject about which it was required to prove—as their middle term and take its differences as their extremes. But as for the final result—that this is what human is, or whatever it might be that is being sought—they do not say anything at all clear about why this is necessary. For indeed, they follow out their different route in its entirety without even thinking that the possible ways to proceed exist.

It is also evident that one can neither disestablish through this procedure nor deduce something concerning a coincident or a special affection, or about a kind,

76. The reference is probably to *Top*. 1.14.

or deduce in those cases in which it is not known whether the facts are this way or that, such as whether the diagonal of a square is incommensurable or commensurable [with its side]. For if someone supposes that every length is either commensurable or incommensurable and that the diagonal is a length, he has deduced that the diagonal is either commensurable or incommensurable. However, if he supposes it to be incommensurable, what needed to be deduced will be taken. Therefore, it cannot be proved: for this is his route, and through this route it cannot be done. Let A stand for "incommensurable or commensurable," B length, C diagonal. It is evident, then, that this way of investigation is neither suitable for every inquiry, nor even useful in those very cases in which it appears to be most fitting. It is therefore evident from what has been said what all demonstrations come from, and how they do so, and what things we should look at in the case of each problem.

1.32
Reducing All Deductions to the Deductions in the Figures

But after these matters, we must say how we can reduce deductions to the figures previously mentioned, for this is still missing from our inquiry. For if we should both **47^a1** have a theoretical understanding of how deductions come into being and also have the power of finding them, and if moreover we can analyze deductions that have already been produced into the figures previously mentioned, our initial project will have attained its end. It will follow at the same time that what we have said previously will be made more secure, and that this is how matters stand will be made clearer by what we are now about to say: for all that is true must be in agreement with itself in every way.

First, then, we must try to select the two premises of the deduction; for it is easier to divide into larger parts than smaller ones, and composite things are larger than what they are made from. Next, we must examine which is universal and which is particular. And if both premises have not been supposed, we must put in the other premise ourselves. For sometimes people who put forward a universal premise do not suppose the premise included in it, either in writing or in speech. Or, they do put these premises forward but leave out what they are concluded through and instead ask for other useless things. We must therefore see whether something superfluous has been supposed, and whether one of the necessary premises has been left out, and then we should put in the latter and take away the former until the two premises are reached. For without these, it is not possible to reduce arguments which have been presented through questions in this way.

It is easy to see what is missing from some arguments, then, but it escapes notice in others, and they appear to deduce because something necessary does follow from the things supposed. For example, if it should be supposed that a substance is not done away with by doing away with what is not a substance and that if the things

out of which something is composed are done away with, what is made from them also perishes. For with these supposed, it is necessary for a part of a substance to be a substance; yet it has not been deduced through what was supposed, but instead premises have been left out. Next, if it is necessary that there is an animal if there is a human, and that there is a substance if there is an animal, it is necessary that there is a substance if there is a human, but this has not yet been deduced (for the premises are not related as we have said).

We are deceived in such arguments through the fact that something necessary follows from the suppositions, because a deduction is also something necessary. But the necessary is more extensive than deduction: every deduction is necessary, but not everything necessary is a deduction. Consequently, if something does result when certain things have been supposed, we should not try to reduce it straightaway but instead first get the two premises, then divide them into their terms and put that term said in both the premises as the middle (for the middle must occur in both premises in all of the figures).

So then, if the middle is predicated and a subject of predication, or if it is predicated and something else is denied of it, it will be the first figure; if it is both predicated of something and denied of something, it will be the middle figure; and if others are predicated of it, or one is denied and another is predicated, it will be the last figure. For this is how the middle was in each figure. And similarly if the premises are not universal; for the definition of the middle term will be the same. It is evident, then, that in any argument in which the same thing is not said multiple times there cannot be a deduction; for no middle term has been supposed.

And since we have found which sort of problem is concluded in each figure, and in which one a universal and in what sort a particular, it is evident that we need not look to all the figures, but only to the one appropriate to each problem. For those problems that are concluded in several figures, we will recognize the figure by the position of the middle term.

1.33
Misleading Appearance of Deduction Because of Position of Terms

It often happens, then, that we are deceived about deductions because something necessary follows, as was said earlier, but sometimes it is as a result of the similarity in position of the terms. We must not overlook this. For example, if A is said of B and B of C: it might seem that if the terms are so related there is a deduction, though there is neither anything necessary nor any deduction at all. For let A stand for "always is," B stand for thinkable Aristomenes, and C stand for Aristomenes. Then it is true that A belongs to B, for thinkable Aristomenes always is. But also B belongs to C, for Aristomenes is thinkable Aristomenes. However, A does not belong to C; for Aristomenes is capable of passing away. For a deduction did not

come about with the terms related in this way, and it would be necessary to take premise AB as universal. But this is false, to claim that every thinkable Aristomenes always is, if Aristomenes is capable of passing away. Next, let C stand for Miccalus, B for musical Miccalus, and A for perishing tomorrow. Then, it is true to predicate B of C, for Miccalus is musical Miccalus. But it is also true to predicate A of B, for musical Miccalus may perish tomorrow. However, to predicate A of C is false. So this is in fact the same as the preceding case: for the statement that musical Miccalus perishes tomorrow is not true universally, and if this is not supposed there was not a deduction. This kind of deception, then, arises from a detail, for we are led to agree as if there were no difference between saying that this belongs to that and that this belongs to every that.

1.34
Misleading Appearances of Deduction Because of Setting-Out

But it will often happen that we are misled because the terms in the premise have not been set-out well—for example, if A is health, B stands for illness, C for human. For it is true to say that it is possible for A to belong to no B (for health belongs to no illness), and again that B belongs to every C (for every human is susceptible of illness). It might seem to follow, then, that it is not possible for health to belong to any human. The cause of this is that the terms are not set-out well verbally, since there will not be a deduction if we substitute the predicates corresponding to the states for them, that is, if "healthy" is put in place of "health" and "ill" in place of "illness." For it is not true to say that being healthy cannot belong to someone who is ill. But if this premise is not supposed, a deduction does not come about, unless it is one of being possible. And that is not impossible: for it is possible for health to belong to no human.

Next, a falsehood can happen in the same way in the middle figure. For to no illness, but to every human, does health possibly belong, so that to no human is illness possible. But in the third figure, the falsehood happens with respect to being possible, for it is possible for both health and illness, or both scientific knowledge and ignorance, or in general for contraries to belong to the same thing, but impossible for them to belong to each other. But this is not in agreement with what was said earlier: for when it was possible for several things to belong to the same thing, it was also possible for them to belong to each other.

It is evident, then, that in all these cases the deception results from the setting-out of the terms. For when predicates corresponding to the states are substituted, no falsehood arises. Thus, it is clear that in the case of such premises the predicate corresponding to the state must always be substituted for the state and put as the term.

1.35
Setting-Out a Term without a Name

One should not always seek to set-out terms with a word, for they will sometimes
30 be sentences to which no name has been assigned. For that reason, it is difficult to reduce such deductions, and moreover it will sometimes happen that we are deceived through this sort of search. For example: "Deduction of immediate propositions is possible. Let A be two right angles, B stand for triangle, C stand for isosceles. Then, A belongs to C through B, but A belongs to B through nothing else. For the trian-
35 gle possesses two right angles intrinsically, so that there will be no middle term of AB, although it is demonstrable." For it is evident that we must not always take the middle term as a particular "this" but rather sometimes as an argument, which is just what happens in the example given.

1.36
Alternative Ways Premises May Be Expressed

One must not take the statement that the first belongs to the middle, and this to the
40 extreme, as always implying that they can be predicated of each other, or that the first
48b1 can be predicated of the middle, and it of the last, in the same way (and likewise in the case of not belonging). Instead, in however many ways *be* or *it is true to say this is that* are said of things, we must assume that *belong* is said in that many ways. Take as an example the statement that there is a single science of contraries. For let A be
5 there being a single science, and let B stand for things contrary to each other. Then, A belongs to B, not in the sense that contraries are a single science of them,[77] but because it is true to say of them that there is a single science of them.

10 Sometimes it happens that the first is said of the middle but the middle is not said of the third. For example, if theoretical wisdom is a science and theoretical wisdom is of the good, the conclusion is that a science is of the good. (So the good is not a science, but theoretical wisdom is a science.) And sometimes, the middle is said of the
15 third, but the first is not said of the middle. For example, if there is a science of every quality or contrary, and the good is both a contrary and a quality, the conclusion is that there is a science of the good (but the good is not a science, nor is a quality or a contrary, though the good is these). And it is possible for neither the first to be said of
20 the middle nor this of the third, with the first sometimes being said and sometimes not being said of the third. For example, if there is a kind of that of which there is a science, and there is a science of the good, the conclusion is that there is a kind of the good, although nothing is predicated of anything. And if that of which there is
25 a science is itself a kind, and there is a science of the good, the conclusion is that the

77. Reading τὸ μίαν εἶναι αὐτῶν ἐπιστήμην. This is meant to be nonsense.

good is a kind: so the first [extreme] is predicated of the [last] extreme, but the terms are not said of each other.

We must take it in the same way in the case of not belonging. For "this does not belong to that" does not always signify that this is not that, but sometimes this is not of that or this is not to that. For example, "There is no movement of a movement or coming-to-be of a coming-to-be, but there is a coming-to-be of pleasure; therefore, pleasure is not a coming-to-be"; or again, "There is a sign of laughter, but there is no sign of a sign; consequently, laughter is not a sign." Similarly in other cases in which a problem is done away with through the kind being said of itself[78] in a way. Next, "The opportune moment is not the time needed, for there is an opportune moment for a god, but not a time needed, because nothing is profitable for a god." Opportune moment, time needed, and god should be put as terms and the premise should be supposed in accord with the inflections of the words. For we say this unconditionally about all cases: terms must always be put in accord with their nominative forms (as "man" or "good" or "contraries," not "man's" or "of the good" or "of contraries"), while premises must be taken in accord with the inflection of each term. For it might be "to this" (as "equal"), or "of this" (as "double"), or "this" in the accusative case (as "hitting" or "seeing"), or "this" in the nominative (as "a human is an animal"), or if the word is inflected in some other way in the premise.

1.37
A Note on the Many Senses of "Belongs To"

"This belongs to that" and "this is true of that" should be taken in as many ways as the ways in which predications have been divided,[79] and these either in some way or unconditionally and either simple or compound; and similarly also with not belonging. (These things must be investigated and better determined.)

1.38
Reduplicated Terms in Premises

Anything reduplicated in the premises is to be put with the first extreme, not with the middle term. I mean, for example, if there is a deduction that of justice there is knowledge that it is good, "that it is good" (or "insofar as it is good") should be put with the first extreme. For let A be knowledge that it is good, B stand for good, C stand for justice. Then it is true to predicate A of B: for there is knowledge that it is good of something that is good. But it is also true to predicate B of C: for justice

78. Reading αὐτὸ.
79. 48^b2–5.

is precisely something good. In this way, then, an analysis results. However, if "that it is good" is put with B, there will not be one, for A will be true of B, but B will not be true of C (for to predicate "good that it is good" of justice is false—or rather, unintelligible). And similarly if it is proved that what is healthy is knowable insofar as it is good, or a goat-stag insofar as non-existent, or that a human is capable of passing away insofar as it is perceptible. For in all these cases of extra predication, the reduplication should be put with the [first] extreme.

The setting of the terms is not the same when something is deduced unconditionally and when it is deduced as something that is such-and-such,[80] or in some respect, or in some way.[81] (I mean, for example, when something good is proved to be knowable and when it is proved of [the] knowable that it is good.) Instead, if it has been proved to be knowable unconditionally, then so-and-so should be taken as the middle term, whereas if it has been proved to be knowable that it is good, something that is such-and-such should be taken. For let A be knowledge that it is so-and-so, let what B stands for be something that is such-and-such, and let C stand for good. Then it is true to predicate A of B: for there was [by assumption] knowledge of what is such-and-such that it is so-and-so. But it is also true to predicate B of C (for what C stands for is something that is such-and-such), so that also A of C. Therefore, there will be knowledge of what is good that it is good (for "such-and-such" is a sign for the thing's special substance). But if being so-and-so had been put as the middle term, and "what is" unconditionally rather than "what is so-and-so" had been added to the [first] extreme, there would not have been a deduction that there is knowledge of what is good that it is good, but rather that it *is* (that is to say, if A stands for knowledge that it is, B stands for being, C stands for good). It is evident, then, that the terms should be taken in this way in particular deductions.

1.39
Use Names Rather Than Accounts in Premises

One should substitute things that have the same meaning for each other (names in place of names, accounts in place of accounts), whether a name or an account, and always take the name instead of the account; for the setting-out of terms will be easier. For example, if there is no difference between saying that the supposable is not the kind of the believable and that what is believable is not precisely a certain sort of supposable (for what is signified is the same), "supposable" and "believable" should be put as terms in place of the account stated.

80. Reading τι τόδε.
81. *SE* 166b37–167a20.

1.40
A Note on "Good" and "the Good"

Since it is not the same thing for pleasure to be *a* good and for pleasure to be *the* good, the terms should not be put in the same way. Rather, if the deduction is that pleasure is *the* good, "the good" should be put as the term, while if the deduction is that pleasure is *a* good, "a good" should be put. And this way also in the other cases.

1.41
Issues Concerning "Belongs"; No Absurdity from Setting-Out

It is not the same thing, either in being or in speaking, [to say] that what B belongs to, A belongs to all of, and to say that what B belongs to all of, A also belongs to all of. For nothing prevents B from belonging to C, but not to every C. For example, let B be beautiful and C white. Then, if beautiful belongs to something white, it is true to say that beautiful belongs to the white, but perhaps not to everything white. So then if A belongs to B, but not to everything B is said of, whether B belongs to *every* C, or merely belongs to it, not only is it not necessary for A to belong to *every* C, it is not even necessary for it to belong at all. But if it belongs to everything B is truly said of, it will follow that whatever B is said of all of, A will be said of all of that. However, if A is said of whatever B is said of all of, nothing prevents B from belonging to C while A does not belong to every C, or even does not belong to C at all. So putting it in three terms, it is clear that "everything B is said of, A is said of" is this: "whatever things B is said of, A is also said of all those." And if B is said of all of something, A is likewise [said of all of it], but if B is not said of all of something, it is not necessary that A be said of all of it.

One should not think that any absurdity results from setting-out. For we do not make any use of there being a certain particular thing; instead, it is like someone who, in giving a proof, says that this line is a foot long, straight, and breadthless (though it is[82] not) but does not use these as something to deduce from. For to speak generally, if something is not related as whole to part, with something else related to it as part to whole, the person who proves does not prove from such a thing, so that neither does any deduction come about from it. We use setting-out in the same way as when we tell[83] a learner to "perceive." For it is not as if the **50^{a}1** conclusion could not be demonstrated without such things, as it is in the case of the premises a deduction is from.

82. Reading οὖσαν.
83. Reading μανθάνοντα λέγοντες.

1.42
Not All the Conclusions in the Same Deduction Are through a Single Figure

Let us not overlook the fact that not all the conclusions in the same deduction are through a single figure, but rather one is through this figure and one is through that one. Clearly, then, analyses must also be produced in this way. And since not every problem is proved in all the figures and instead they have been arranged according to each figure, it is evident from the conclusion in which figure we should seek.

1.43
On Deductions Attacking a Definition

In arguments attacking a definition that happen to draw a conclusion about one of the terms in the definition, one should put what the conclusion was drawn about as a term rather than the whole account (for confusion is less likely to result because of length). For example, if someone proved that water is a drinkable liquid, drinkable and water should be put as the terms.

1.44
Arguments from an Assumption Not to Be Reduced

Moreover, we should not try to reduce deductions from an assumption; for it is not possible to reduce them from the premises supposed. For these arguments were not proved through a deduction, but instead all of them were assented to on the basis of an agreement. For example, if someone, making the assumption that if there is not one capacity for contraries, there is not one science of them either, argued next that there is not one[84] capacity for [every pair of] contraries—for example, in the case of what makes healthy and what makes unhealthy (for the same thing would be at the same time healthy and unhealthy). A proof has then been presented that there is not one capacity for every [pair of] contraries, but it has not been proved that there is not one science of them. And yet it is necessary to agree to this, although not on the basis of a deduction but on the basis of an assumption. This argument cannot be reduced, then, but that there is not a single capacity can be, for the latter was perhaps a deduction but the former was an assumption.

It is likewise with deductions that conclude through the impossible, for these arguments also cannot be analyzed; however, the part that is the reduction to the impossible can be analyzed (for that is proved by a deduction), while the other part

84. Reading μία.

cannot be (for that is concluded from an assumption). These deductions differ from the ones discussed previously because in the earlier ones, it was necessary for [the opponent] to agree in advance whether he is going to concur (that is, concur that if it is proved that there is a single capacity of contraries, the science of them is also the same). In these latter cases, however, people concur even without having made an agreement in advance because the falsehood is obvious (for example, that when it is supposed that the diagonal is commensurable odd numbers are equal to even ones).

Many other deductions are also brought to a conclusion from an assumption, and these must be examined and accurately marked out. We will say later[85] what the differences among these are and in how many ways something can be deduced from an assumption. But for the present, let this much be evident to us: that it is not **$50^{b}1$** possible to analyze these sorts of deductions into the figures. (And we have explained due to what cause this is so.)

1.45
Reducing Deductions from One Figure to Those in Another

For those problems that are proved in several figures, if they have been deduced in one of those figures, it is possible to reduce the deduction to the other figure. For example, a privative deduction in the first figure can be reduced to the second and a privative deduction in the middle figure reduced to the first. Not all of the deductions can be reduced, however, but only some. This will be evident in what follows. For if A belongs to no B and B to every C, A belongs to no C: in this way, then, it is the first figure, but if the privative is converted it will be the middle figure (for B belongs to no A but to every C). And similarly if the deduction is not universal but particular—for example, if A belongs to no B but B belongs to some C (for when the privative is converted it will be the middle figure). The universal deductions in the second figure can be reduced to the first figure, but only one of the particular deductions can be. For let A belong to no B but to every C. Then when the privative is converted it will be the first figure (for B will belong to no A and A to every C). But if the positive is with B and the privative with C, C must be put as the first term. For this belongs to no A and A to every B, so that C belongs to no B, and therefore neither does B belong to any C (for the privative converts). And if the deduction is particular, when the privative is with the major extreme, the deduction can be reduced to the first figure, as when A belongs to no B and to some C. For when the privative is converted, it will be the first figure (for B belongs to no A and A to some C). But when it is the positive premise, the deduction cannot be analyzed (for example, if A belongs to every B and not to every C: for AB does not admit of conversion, nor would there be a deduction if it did).

85. Aristotle does not address this topic in any surviving treatise.

Next, the deductions in the third figure cannot all be analyzed into the first, but those in the first can all be analyzed into the third. For let A belong to every B and B to some C. Then, since the particular positive converts, C will belong to some B. But A belonged to every B, so that it becomes the third figure. And likewise if the deduction is privative (for the particular positive converts, so that A will belong to no B and C will belong to some).

51^a1 Only one of the deductions in the last figure is not analyzed into the first (the one when the privative is not put as universal), but all the others are so analyzed. For let A and B be predicated of every C. Then, C will convert partially in relation to each term. Therefore, it will belong to some B, so that it will be the first figure (if A belongs to every C and C to some one of the Bs[86]). And if A belongs to every C and B to some C, the argument is the same. For C converts in relation to B. But if B belongs to every C and A to some C, B must be put as the first term (for B belongs to every C and C to some A, so that B belongs to some A; and, since the particular converts, A will also belong to some B). If the deduction is privative, then, when the terms are universal it must be supposed in the same way. For let B belong to every C and A to none; then, C will belong to some B and A to no C, so that C will be the middle term. Similarly if the privative is universal and the positive is particular (for A will belong to no C and C to some of the Bs). However, if the privative is supposed as particular, no analysis will be possible (that is, if B belongs to every C and A does not belong to some C). For when BC is converted both the premises will be particular.

It is also evident that in order to analyze the figures into each other, the premise with the minor extreme must be converted in both the figures; for it was when this premise was substituted that the transition to the other figure took place.

One of the deductions in the middle figure can be analyzed into the third and the other cannot be. For when the universal is privative, the deduction can be analyzed: if A belongs to no B and to some C, both convert alike in relation to A, so that B belongs to no A and C to some (the middle, therefore, is A). But when A belongs to every B and does not belong to some C, an analysis is not possible (for neither of the premises resulting from the conversion is universal).

The deductions from the third figure can also be analyzed into the middle if the privative is universal, that is, if A belongs to no C and B belongs to some or to every C (for C will also belong to no A and to some B). But if the privative is particular, the deduction cannot be analyzed; for a particular negative does not admit of conversion.

It is evident, then, that the deductions that are not analyzed in these figures are the same ones that were also not analyzed into the first, and that when deductions **51^b1** are reduced to the first figure, these deductions alone are brought to a conclusion through the impossible.

From what has been said, then, it is evident how one must reduce deductions, and also evident that the figures are analyzed into each other.

86. Reading τινὶ τῶν B.

1.46
"Not to Be This" and "to Be Not This" Distinguished

It makes a certain difference in establishing and disestablishing whether one thinks that "not to be this" and "to be not this" signify the same thing or different things (for example, "not to be white" and "to be not white").[87] For these do not signify the same thing, nor is "to be not white" the negation of "to be white" (instead, "not to be white" is). The argument for this is as follows: "can walk" has the same relationship to "can not walk" as "is white" has to "is not white," or as "knows the good" has to "knows the not good." For "knows the good" is no different from "is knowing the good," and "can walk" is no different from "is one who can walk."[88] Consequently, their opposites, "can not walk" and "is one who can not walk," are also no different. Therefore, if "is not one who can walk" does signify the same thing as "is one who can not walk" (or "can not-walk"[89]), these can even belong to the same thing at the same time (for the same person can walk and not-walk, and is knowledgeable of the good and the not good): but an opposite affirmation and negation do not belong at the same time to the same thing. Therefore, just as "not to know the good" and "to know the not good" are not the same, neither are "to be not good" and "not to be good" the same: for with terms related in the same way, if those in one pair are different, those in the other pair are also different.

Nor are "to be not equal" and "not to be equal" the same. For there is some subject for "to be not equal" (that is, whatever it is that is unequal) but there is not any subject for the other. This is why not everything is equal or unequal, though everything is equal or not equal.

Next, "it is a not white log" and "it isn't a white log" do not belong to things together. For if a log is not white it will be a log, whereas it is not necessary that what isn't a white log is a log.

Consequently, it is evident that "it is not good" is not the negation of "it is good."[90] Therefore, if either the affirmation or the negation is true of every single thing, then

87. Aristotle's examples sometimes depend on distinguishing whether "not" negates a whole sentence or a single word (in modern terminology, its scope). In Greek, that difference is expressed entirely by word order, but this cannot be reproduced in English. Instead, a hyphen is sometimes used to connect "not" with the expression it modifies.

88. Literally, "is being-able-to walk." English "can" has no present participle; "is one who can walk" is a workaround.

89. Greek has two words for "not": *ou* and *mê*. Usually, *mê* is used with infinitives, but up to this point in the argument Aristotle has used *ou* with "to walk" (*badizein*) as well as with "white" and "knows." Here he appears to take note that *ou badizein* is not quite normal Greek and gives the usual *mê badizein* as an alternative. To reflect this, *ou badizein* is translated as "not walk" and *mê badizein* as "not-walk."

90. These examples rely on a distinction it is impossible to reproduce in ordinary English: *ouk esti leukon*—word for word "not it is white"—is the negation of "it is white" and corresponds to English "it isn't white," but *estin ou leukon* (word for word "it is not white") *can* be understood

if "it is not-good" is not a negation it is clear that it is a sort of affirmation. But there is a negation of every affirmation. Therefore, the negation of this affirmation is "it isn't not-good."

They stand in this order in relation to each other. Let A stand for "to be good," B stand for "not to be good," C stand for "to be not-good" (which is below B), and D stand for "not to be not-good" (which is below A). Either A or B will belong to everything but not at the same time to the same thing, and also either C or D will belong to everything and not both to the same thing. And it is necessary for B to belong to everything to which C belongs: for if it is true to say that it is not-white, it is also true to say that it isn't white (for it is impossible to be white and to be not-white at the same time, or to be a not-white log and to be a white log), so that if the affirmation does not belong, the negation will. But C does not always belong to B (for what is not a log at all will not be a not-white log either). Therefore, in reverse order, D belongs to everything A belongs to: for either C or D belongs to everything, and since it is not possible to be at the same time not-white and white, D will belong (for of what is white it is true to say that it isn't not-white). But A will not be true of every D; for it is not true to say A (that it is a white log) of what is not a log at all. Consequently, it is true to say D of it, but it is not true to say A (that it is a white log). It is also clear that it is not possible for A and C to belong to anything the same but that it is possible for B and D to belong to the same thing.

Privations also have the same relationship to their predications when put in this arrangement. Let A stand for equal, B stand for not equal, C stand for unequal, D stand for not unequal.

In the case of a group of things, where the same term belongs to some of them and not to others, the negation might similarly be true either because they are not all white or because each of them is not white, though it is false that each is not white or that all are not white. In the same way, the negation of "every animal is white" is not "every animal is not white" (for both are false), but "not every animal is white."

And since it is clear that "it is not white" and "it isn't white" signify different things, and that one is an affirmation and the other a negation, it is evident that the way of proving each is not the same (that is, proving that whatever is an animal is not white, or that it is possible for it not to be white, and proving that it is true to call it not-white—for that is to be not-white). But "it is true to call it white" and "[it is true to call it] not-white" *are* proved in the same way, for both are proved by establishing through the first figure. For "true" is ordered in the same way as[91] "is": the negation of "it is true to call it white" is not "it is true to call it not white" but

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as saying of something that it has the affection of being "not white." This is represented in the translation with a hyphen between "not" and the following term ("it is not-white"), but in Greek the difference is entirely in the word order.

91. I.e., in Greek the word order is the same: the negation of "it is true to call it white" is, word for word, "not it is true to call it white."

instead "it isn't true to call it white." So if [the thing to be proved] is[92] "it is true to say that whatever is a human is musical" or "not musical," then suppose that whatever is an animal is musical or is not musical, and it has been proved. But "whatever is a human is not musical" is proved by disestablishing it in accordance with the three ways stated.

In general, whenever A is so related to B that it is not possible for them to belong to the same thing at the same time but necessary for one or the other of them to belong to everything, and C and D, in turn, are likewise related, and A follows C and does not convert with it, D will also follow B and will not convert with it. Also, it is possible for A and D to belong to the same thing but not possible for B and C to.

First, then, it is evident from the following argument that D follows B. Since one or the other of CD belongs to everything of necessity, but it is not possible for C to belong to what B does (because C brings A along with it, and it is not possible for A and B to belong to the same thing), it is evident that D will follow B. Next, since C does not convert with A, but either C or D belongs to everything, it is possible for A and D to belong to the same thing. However, this is not possible for B and C, because A follows along with C (for something impossible results). It is evident, then, that B does not convert with D either, since it is possible for D and A to belong at the same time.

Sometimes, we are also deceived in this sort of arrangement of terms because of not correctly taking opposites one or the other of which must necessarily belong to everything—for example, if it is not possible for A and B to belong to the same thing at the same time, but it is necessary for one of them to belong to what the other does not, and next C and D are likewise related, and A follows everything C belongs to. For it will follow that B belongs of necessity to whatever D does, and that is precisely what is false. For [we might reason as follows:] "Take F to stand for the negation of AB, and next take H to stand for the negation of CD. Then it is necessary for either A or F to belong to everything (for either the affirmation or the negation does). Next, either C or H belongs to everything (for they are an affirmation and negation). But A was assumed to belong to everything C belongs to. Consequently, H belongs to everything F does. Next, since one or the other of F, B belongs to everything, and one or the other of H, D likewise, and H follows F then B will also follow D (for we know this). Therefore, if A belongs to C, B also belongs to D." But this is incorrect, for the consequence was in reverse order for terms related in this way. For it is surely not necessary for either A or F to belong to everything, nor necessary for either F or B to (for F is not the negation of A, since "not good" is the negation of "good" but "not good" is not the same as "neither good nor not good"). And in the same way also in the case of C, D; for the negations that were supposed are two.

92. Reading ἔστι.

BOOK 2

2.1
Additional Conclusions That Follow in Deductions

We have already gone through the number of figures a deduction comes about in, and the sorts and number of premises it is through, and when and why this occurs; and in addition what things one must look at when disestablishing or establishing, and how one must search for premises concerning whatever is proposed [for proof], in accord with any methodical inquiry whatever, and finally the route through which we may obtain the starting-points concerning each subject.

But since some deductions are universal and others are particular, all the universals always deduce more than one thing; among particular deductions, the positive ones deduce more than one thing, but negatives deduce only the conclusions. For the other premises convert, but the privative [particular] premise does not convert, and the conclusion is one thing predicated of another; consequently, the other deductions deduce something additional. For example, if A has been proved to belong to every or to some B, it is also necessary that B belongs to some A, and if A belongs to no B, neither does B belong to any A (and that is a different conclusion from the previous one). However, if A does not belong to some B, it is not also necessary that B does not belong to some A, since it is possible for it to belong to all.

This cause, then, is common to all deductions, both universal and particular. However, something different can be said for the universal ones: whatever terms are under either the middle or the conclusion, there will be the same deduction for them all if the former are put under the middle or if the latter are put under the conclusion. For example, if conclusion AB is [deduced] through C, then whatever terms are below B or C, it will be necessary that A is said of all of them. For if D is in B as a whole, and B in A, D will also be in A. Next, if E is in C as a whole, and C in A, E will also be in A. And similarly if the deduction is privative.

But in the second figure, we can deduce only what is below the conclusion—for example, when A belongs to no B and to every C (the conclusion is that B belongs to no C). If D is below C, it is evident that B will not belong to it. However, it is not clear by means of the deduction that it does not belong to those below A. To be sure, B does not belong to E if E is below A. But what was proved through the deduction was that B belongs to no C, while that B does not belong to A was supposed as undemonstrated; consequently, that B does not belong to E does not follow through the deduction. And in the case of particular deductions, no necessary result will be possible for terms below the conclusion (for a deduction does not come about when this premise is taken as particular). One will be possible for all those below the middle term, except that it does not result by means of the [same] deduction. For example, if A belongs to every B and B to some C, there will not be a deduction for what is put

below C, but there will be one for what is put below B, although it is not through the deduction already formed.

And similarly in the case of the other figures: there will not be a deduction for something below the conclusion, but there will be one for what is below the other term, except that it results not through the deduction, but in the way that those below the middle were also proved from the undemonstrated premise in the case of the universals. Consequently, either there will not be a deduction in the former case, or there will also be one in the latter case. **53^b1**

2.2
True Conclusions from False Premises: First Figure

Matters may be such that the premises through which a deduction comes about are true, or that they are false, or that one premise is true and the other false. But the conclusion is of necessity either true or false. From true premises, then, it is not possible to deduce a false conclusion, but it is possible to deduce a true conclusion from false premises (except that it is not a deduction of the why but of the that, for a deduction of the why is not possible from false premises). The cause due to which this is so will be explained in what follows.

First, then, it is clear from the following that it is not possible to deduce a false conclusion from true premises. For if it is necessary that B is when A is, when B is not it is necessary that A is not. Therefore, if A is true, it is necessary that B is true, or else it will follow that the same thing both is and is not at the same time: but that is impossible.

But one must not think that, because A is set-out as a single term, it is possible for something to follow of necessity when a single thing is so; for it cannot. For what follows of necessity is the conclusion, and the fewest things through which this comes about is three terms and two intervals (that is, premises). So, then, if it is true that A belongs to everything B belongs to, and B to what C belongs to, it is necessary for A to belong [to what C belongs to], and this cannot be false (for the same thing would belong and not belong at the same time). Therefore, A is put as one thing, the two premises supposed together. It is similar in the case of privative deductions. For it is not possible to prove a false conclusion from true premises.

It is possible, however, to deduce a truth from false premises, either when both premises are false or when only one is (this cannot be either premise indifferently, if it is taken to be wholly false, but only the second; however, if it is not taken as wholly false, it can be either premise). For let A belong to the whole of C and to none of the Bs,[93] and B belong to no C. (This is possible: for example, animal does not belong to any stone, nor stone to any human.) Then, if A is supposed to belong to every B and

93. Reading τῶν B.

B to every C, A will belong to every C; consequently, from premises both of which are false the conclusion is true (for every human is an animal). The privative deduction is likewise. For it is possible for neither A nor B to belong to any C and yet A to belong to every B—for example, if the same terms are supposed but human is put as the middle (for neither animal nor human belongs to any stone, but animal belongs to every human). Thus, if one takes one term to belong to none of what it does belong to and the other to belong to all of what it does not belong to, the conclusion will be true from premises both of which are false. This can also be proved in the same way if each premise is taken to be false in part.

But if only one premise is put as false, then when the first premise (that is, premise AB) is wholly false the conclusion cannot be true, but when premise BC is wholly false it can be. (By "wholly false" I mean the contrary premise, that is, if what belongs to none is supposed to belong to every, or if what belongs to every is supposed to belong to none.) For let A belong to no B and B to every C. If I take premise BC as true and AB as wholly false (that is, take A to belong to every B), it is impossible for the conclusion to be true (for A did not belong to any of the Cs, if it belongs to none of what B belongs to and B belongs to every C). And similarly, if A belongs to every B and B to every C, and BC was supposed as a true premise but AB as a wholly false one (that is, A was taken to belong to none of that to which B belongs), the conclusion will be false: for A will belong to every C, since A belongs to everything to which B belongs and B to every C. It is evident, then, that when the first premise is supposed as wholly false (whether it is affirmative or privative) and the other premise as true, the conclusion cannot be true.

However, when the first premise is supposed as not wholly false, the conclusion may be true. For if A belongs to every C and to some B, and B belongs to every C (for example, animal belongs to every swan and to something white, and white belongs to every swan), if A is supposed to belong to every B and B to every C, A will belong to every C truly (for every swan is an animal). And similarly if AB is privative. For it is possible for A to belong to some B and to no C and for B to belong to every C—for example, animal belongs to something white and to no snow, and white belongs to all snow. Therefore, if A is taken to belong to no B and B to every C, A will belong to no C.

But if premise AB is supposed as wholly true and premise BC as wholly false, there will be a true deduction. For nothing prevents A from belonging to every B and every C and yet B belonging to no C—for example, such forms of the same kind as are not under each other. For animal belongs both to horse and to human, but horse belongs to no human. So, if A is taken to belong to every B and B to every C, the conclusion will be true with premise BC being wholly false. And similarly if premise AB is privative. For it is possible for A to belong neither to any B nor to any C, nor B to any C, as a kind does to forms from another kind. For animal belongs neither to music nor to medicine, nor does music belong to medicine. Therefore, if A is supposed to belong to no B and B to every C, the conclusion will be true. And

if premise BC is not false wholly, but only in part, the conclusion will also be true in this way. For nothing prevents A belonging to the whole both of B and of C and yet B belonging to some C, as a kind does to a form and its difference. For animal belongs to every human and to everything that walks, but human belongs to something, not everything, that walks. Therefore, if A is assumed to belong to every B and B to every C, A will belong to every C, which was true. And similarly if premise AB is privative. For it is possible for A to belong neither to any B nor to any C but yet for B to belong to some C, as a kind does to a form and a difference from another kind. For animal belongs neither to any wisdom nor to any theoretical science, but wisdom belongs to some theoretical science. If, then, A is taken to belong to no B and B to belong to every C, A will belong to no C (and this was true).

In the case of particular deductions, it is possible for the conclusion to be true when the first premise is wholly false and the other premise true, or when the first premise is false in part and the other premise is true, or when the first premise is true and the other premise false in part, or when both premises are false. For nothing prevents A belonging to no B and to some C and B belonging to some C, as animal belongs to no snow but to something white and snow to something white. Therefore, if snow is put as the middle term and animal as the first, and A is supposed to belong to the whole of B and B to some C, premise AB is wholly false, premise BC is true, and the conclusion is true.

And similarly if premise AB is privative. For it is possible for A to belong to the whole of B and not to belong to some C, and yet for B to belong to some C, as animal belongs to every human but does not follow something white and human belongs to something white. Consequently, putting human as the middle term, if A is supposed to belong to no B and B to some C, the conclusion will be true when premise AB is wholly false. The conclusion can also be true if premise AB is false in part. For nothing prevents A from belonging both to some B and to some C and B belonging to some C, as animal belongs to something beautiful and to something large and beautiful belongs to something large. Therefore, if A is supposed to belong to every B and B to some C, premise AB will be false in part, premise BC true, and the conclusion true. And similarly also when premise AB is privative (the terms will be the same and positioned likewise for the demonstration). **55^{a}1**

Next, if premise AB is true and premise BC false, the conclusion can be true. For nothing prevents A from belonging to the whole of B and to some C and B belonging to no C, as animal belongs to every swan and to something black and swan belongs to nothing black. Consequently, if A is supposed to belong to every B and B to some C, the conclusion will be true when BC is false. And similarly when premise AB is taken as privative. For it is possible for A to belong to no B and not belong to some C and yet for B to belong to no C, as a kind does to a form from another kind and to a coincident of its own forms. For animal belongs to no number and to something white, and number to nothing white. Therefore, if number is put as the middle term

and A is supposed to belong to no B and B to some C, A will not belong to some C (which was [supposed to be] true), and premise AB is true while premise BC false.

And if premise AB is false in part and premise BC is also false, the conclusion can be false. For nothing prevents A from belonging both to some B and to some C and B to no C—for example, if B is contrary to C and both are coincidents in the same kind. For animal belongs to something white and to something black, but white belongs to nothing black. Therefore, if A is supposed to belong to every B and B to some C, the conclusion will be true. And likewise if premise AB is supposed as privative (the same terms, arranged likewise, may be put for the demonstration).

The conclusion can also be true when both premises are false. For it is possible for A to belong to no B and to some C and yet B to belong to no C, as a kind does to a form from another kind and to a coincident of its own forms. For animal belongs to no number and to something white, and number belongs to nothing white. Therefore, if A is supposed to belong to every B and B to some C, the conclusion is true but the premises are both false. And similarly when premise AB is privative. For nothing prevents A belonging to the whole of B and not belonging to some C and B not belonging to any C, as animal belongs to every swan and does not belong to something black and swan belongs to nothing black. Consequently, if A is supposed to belong to no B and B to some C, A will not belong to some C (the conclusion, then, is true, and the premises are false).

2.3
True Conclusions from False Premises: Second Figure

In the middle figure it is possible to deduce a true conclusion through false premises in all ways: when both premises are supposed as wholly false, or when either one is supposed as false in part, or when one as true and the other as [wholly] false (no matter which one is put as false), {or if both are false in part, or if one is simply true and the other false in part, or if one is wholly false and the other in part true,}[94] in the case of universal as well as particular deductions.

For if A belongs to no B and to every C, as animal belongs to no stone and to every horse, if the premises are put contrariwise and A is supposed to belong to every B and to no C, the conclusion will be true from wholly false premises. And similarly if A belongs to every B and to no C (for it will be the same deduction).

And again if one premise is wholly false and the other wholly true. For nothing prevents A from belonging both to every B and to every C and yet B to no C, as a kind does to forms that are not under each other. For animal belongs both to every horse and to every human, and no human is a horse. Therefore, if animal is supposed to belong to all of one and none of the other, one premise will be wholly false, the

94. The bracketed text has been rejected by editors as an inaccurate later addition.

other premise will be wholly true, and the conclusion will be true, no matter which one the privative is put in relation to.

Also, if one premise is false in part and the other premise wholly true. For it is possible for A to belong to some B and to every C and yet for B to belong to no C, as animal belongs to something white and to every raven, and white to no raven. If, then, A is supposed to belong to no B and to the whole of C, premise AB is false in part, premise AC is wholly true, and the conclusion is true. And likewise when the privative is put the other way around (for the demonstration is through the same terms).

Also, if the affirmative premise is false in part and the privative premise wholly true. For nothing prevents A from belonging to some B and not belonging to the whole of C, and B belonging to no C, as animal belongs to something white and to no pitch, and white to no pitch. Thus, if A is supposed to belong to the whole of B and to no C, premise AB is false in part, premise AC is wholly true, and the conclusion is true.

Also, if both premises are false in part the conclusion can be true. For it is possible for A to belong both to some B and to some C and for B to belong to no C, as animal belongs both to something white and to something black and white belongs to nothing black. Therefore, if A is supposed to belong to every B and to no C, both premises **56^a1** are false in part but the conclusion is true. And similarly if the privative premise is put the other way around ([the proof is] through the same terms).

This is also evident in the case of particular deductions. For nothing prevents A belonging to every B and to some C and B not belonging to some C (for example, animal belongs to every human and to something white, but human can fail to belong to something white). Therefore, if it is supposed that A belongs to no B and belongs to some C, the universal premise is wholly false, the particular premise is true, and the conclusion is true. And likewise also if premise AB is supposed as affirmative. For it is possible for A to belong to no B and not to some C and for B not to belong to some C (for example, animal belongs to nothing inanimate and not[95] to something white, but inanimate may fail to belong to something white). Therefore, if A is supposed as belonging to every B and not belonging to some C, premise AB (the universal premise) is wholly false, premise AC is true, and the conclusion is true.

And [the conclusion may be true] when the universal premise is put as true and the particular premise as false. For nothing prevents A following neither any B nor any C but yet B not belonging to some C, as animal belongs to no number or anything inanimate and number does not follow something inanimate. Then, if A is put as belonging to no B and to some C, the conclusion will be true, as will the universal premise, but the particular premise will be false.

And likewise when the universal premise is put as affirmative. For it is possible for A to belong to the whole both of B and of C, but yet for B not to follow some C, as

95. Reading λευκῷ δὲ τινὶ οὔ.

a kind in relation to its form and the difference. For animal follows every human and follows walking as a whole, but human does not follow everything walking. Consequently, if A is supposed as belonging to the whole of B and not belonging to some C, the universal premise is true, the particular premise is false, and the conclusion is true.

And it is evident that a true conclusion is also possible from premises that are both false, since it is possible for A to belong to the whole of B and of C, but yet for B not to follow some C. For if A is supposed to belong to no B and to some C, both premises are false but the conclusion is true. And similarly if the universal premise is positive and the particular premise is privative. For it is possible for A to follow no B and every C and B not to belong to some C (as animal follows no science and every human and science does not follow every human). Therefore, if A is supposed to belong to the whole of B and not to follow some C, the premises are false but the conclusion is true.

2.4
True Conclusions from False Premises: Third Figure

There can also be a true conclusion through false premises in the last figure when both premises are wholly false, or when each premise is false in part, or when one premise is wholly true and the other false, or when one is false in part and the other wholly true, or the reverse, or in whatever other ways it is possible to substitute premises. For nothing prevents neither A nor B belonging to any C and yet A belonging to some B. For example, neither human nor walking follows anything inanimate and yet human belongs to something walking. If A and B are taken to belong to every C, then, the premises are wholly false but the conclusion true. And likewise also when one premise is privative and the other is affirmative. For it is possible for B to belong to no C and A to every C and for A not to belong to some B (for example, black belongs to no swan, animal to every swan, and animal does not belong to everything black). Consequently, if B is supposed to belong to every C and A to none, A will not belong to some B. The conclusion is then true but the premises are false.

The conclusion can also be true if each premise is false in part. For nothing prevents both A and B belonging to some C, and A belonging to some B (for example, white and beautiful belong to some animal and white belongs to something beautiful). Therefore, if A and B are put as belonging to every C, the premises are false in part and the conclusion is true. And similarly when premise AC is put as privative. For nothing prevents A not belonging to some C, B belonging to some C, and A not belonging to every B (as white does not belong to some animal, beautiful does belong to some animal, and white does not belong to everything beautiful). Consequently, if A is supposed to belong to no C and B to every C, both the premises are false in part and the conclusion is true.

And likewise when one premise is taken as wholly false and the other as wholly true. For it is possible for both A and B to follow every C but yet for A not to belong to some B (for example, animal and white both follow every swan, and yet animal does not belong to everything white). Therefore, putting these as the terms, if B is supposed to belong to the whole of C, and A not to belong to the whole of it, premise BC will be wholly true, premise AC wholly false, and the conclusion true. And similarly if BC is false and AC true (for the terms for the demonstration are the same). Also, if both premises are supposed as affirmative. For nothing prevents B following every C, A not belonging to it as a whole, and A belonging to some B (for example, animal belongs to every swan, black to no swan, and black belongs to some animal). Consequently, if A and B are supposed to belong to every C, premise BC is wholly true, premise AC wholly false, and the conclusion true. And similarly when premise AC is supposed as true (for the demonstration is through the same terms).

Next, when one premise is wholly true and the other is false in part. For it is possible for B to belong to every C, for A to belong to some C, and for A to belong to some B (for example, two-footed belongs to every human, beautiful does not belong to every human, and beautiful belongs to something two-footed). So then, if both A and B are supposed to belong to the whole of C, premise BC is wholly true, premise AC is false in part, and the conclusion is true. And similarly when premise AC is taken as true and premise BC as false in part (for the demonstration will be with the same terms transposed). And when one premise is privative and the other is affirmative. For since it is possible for B to belong to the whole of C, A to some C, and—with the terms so related—for A not to belong to every B, therefore if B is taken to belong to the whole of C and A to none, the privative premise is false in part and the other premise is wholly true, as is the conclusion. Next, since it has been proved that when A belongs to no C and B belongs to some C it is possible for A not to belong to some B, it is evident that when premise AC is wholly true and premise BC false in part, it is also possible for the conclusion to be true. For if A is supposed to belong to no C and B to every C, premise AC is wholly true and premise BC false in part.

It is also evident that in particular deductions a true conclusion can be deduced through false premises in all ways. For the same terms are to be taken as when the premises are universal: the positive terms in positive deductions, the privative terms in privative deductions (for it makes no difference with respect to the setting-out of the terms whether we take what belongs to none to belong to every or take what belongs to some to belong universally). And similarly for the privatives.

It is evident, then, that if the conclusion is false, it is necessary for either all or some of the premises that the argument depends on to be false, but when the conclusion is true, it is not necessary either for one or for all of the premises to be true; instead, it is equally possible, when none of the premises in the deduction is true, for the conclusion to be true, although not of necessity. The cause of this is that when two things are so related to each other that if one is, the other of necessity is, when

the second is not, the first will not be either, but when the second is, there is no necessity for the first to be. But it is impossible for the same thing to be of necessity both when a certain thing is and when that same thing is not (I mean, for example, for B to be of necessity large if A is white, and for B to be of necessity large if A is not white). For whenever it is the case that if this thing (A) is white, that thing (B) is necessarily large, and that if B is large C is not white, if A is white, it is necessary that C is not white. And when there are two things such that if one of them is, it is necessary for the other to be, if the latter is not, the first necessarily is not. So if B is not large, A cannot be white. But if it is necessary for B to be large when A is not white, it results of necessity that when B is not large, this very thing (B) is large. But that is impossible: for if B is not large, A will of necessity not be white; therefore, if B will also be large when A is not white, it follows that if B is not large it is large, as it would through three terms.

2.5
Circular or Reciprocal Proof: First Figure

Proving in a circle or reciprocally is taking the conclusion and one of the premises (taken in reversed order of predication) and concluding through them the remaining premise that was assumed in the other deduction. For example: supposing someone who was required to prove that A belongs to every C and proved this through B, if he next were to prove that A belongs to B by supposing A to belong to C and C to B (previously, he supposed B to belong to C, in the reverse order). Or, if it is required to prove that[96] B belongs to C, if he supposes A to be predicated of C (which was the conclusion) and B predicated of A (previously, A was supposed as predicated of B, in the reverse order). Proving reciprocally is not possible otherwise. For if another middle is taken, it will not be in a circle, for neither of the same premises is taken. And if one of these premises is taken, it is necessary that it be only one. For if both are taken, the conclusion will be the same, but it must be different.

In the case of terms that do not convert with each other, then, the deduction comes about from one undemonstrated premise (for it cannot be demonstrated through these terms that the third term belongs to the middle or the middle to the first). But with terms that do convert, they can all be proved through each other—for example, if A, B, and C convert with each other. For let conclusion AC have been proved through middle B, and again AB through the conclusion together with premise BC converted, and likewise BC through the conclusion and premise AB converted. Both premise CB and premise BA then need to be demonstrated; for we have used only these premises as undemonstrated. Therefore, if B is taken to

96. Retaining ὅτι.

belong to every C and C to every A, there will be a deduction relating B to A. Next, if C is taken to belong to every A and A to every B, it is necessary for C to belong to every B. In both of these deductions, premise CA was taken as undemonstrated (for the others had been proved). Consequently, if we can demonstrate this premise, all of the premises will have been proved through each other. Accordingly, if C is supposed to belong to every B and B to every A, both the premises taken have been demonstrated, and it is also necessary for C to belong to A. It is evident, then, that only with terms that convert can there be circular or reciprocal demonstrations: for others, it is as we said previously.[97] It also happens that even in these cases we use the very thing proved for its demonstration. For "C is said of B" and "B is said of A" are proved by means of taking "C is said of A," but "C is said of A" is proved through these [first two] premises; consequently, we use the conclusion for its demonstration.

In the case of privative deductions, reciprocal proof is as follows. Let B belong to every C and A to no B (the conclusion is that A belongs to no C). If one must next conclude that A belongs to no B (which one previously supposed), let A belong to no C and C to every B (for that way the premise is reversed). But if it is required to conclude that B belongs to C, AB can no longer be converted in the same way (for "B belongs to no A" and "A belongs to no B" are the same premise). Instead, one must take B to belong to all of what A belongs to none of. Let A belong to none of the Cs[98] (which was precisely the conclusion), and let B be taken to belong to all of what A belongs to none of. It is necessary, then, for B to belong to every C. Consequently, each of the three premises has become a conclusion; and this is what it is to demonstrate in a circle: to take the conclusion and one premise reversed and deduce the remaining premise.

In the particular deductions, the universal premise cannot be demonstrated through the others, but the particular premise can be. It is evident that it is not possible to demonstrate the universal premise. For a universal is proved by means of universals, but the conclusion is not universal, and one must prove from the conclusion and the other premise. Moreover, no conclusion comes about at all when the [other] premise is converted; for both premises become particular. The particular premise can be demonstrated, however. For let A have been proved of some C through B. Then, if B is taken to belong to every A and the conclusion remains, B will belong to some C (for it becomes the first figure, and A is the middle). But if the deduction is privative, the universal premise cannot be proved because of what was also stated previously. However, the particular premise can be, if AB is converted in the same way as in the case of the universal deductions (that is, that what A does not belong to some of, B belongs to some of). For otherwise, no deduction comes about because the particular premise is negative.

97. $57^{b}32–35$.
98. Reading μηδενὶ τῶν Γ.

2.6
Circular or Reciprocal Proof: Second Figure

In the second figure, the affirmative cannot be proved this way but the privative can be. The positive, then, cannot be proved because the premises are not both affirmative (for the conclusion is negative, and a positive was proved from premises that are both affirmative). But the negative is proved as follows. Let A belong to every B and to no C (the conclusion is that B belongs to no C). Then, if B is taken to belong to every A and to no C,[99] it is necessary for A to belong to no C. For it becomes the second figure, and the middle is B. And if AB was taken as privative and the other premise as positive, it will be the first figure. For C belongs to every A and B to no C, so that B does not belong to any A, nor, therefore, A to any B. A deduction does not come about through the conclusion and one premise, then, but there will be one when another premise is taken in addition.

If the deduction is not universal, the universal premise cannot be proved, due to the same cause that we also said previously. The particular premise, however, is proved when the universal is positive. For let A belong to every B and not to every C (the conclusion is BC). Therefore, if B is supposed to belong to every A and not to every C, A will not belong to some C (the middle is B). But if the universal premise is negative, premise AC cannot be proved by converting AB (for it results either that both the premises are negative or that one of them is, so that there will not be a deduction). However, it can be proved in a way similar to the case of the universal deductions if A is taken to belong to some of what B does not belong to some of.

2.7
Circular or Reciprocal Proof: Third Figure

In the third figure, when both the premises are supposed as universal it is not possible to prove reciprocally. For a universal is proved through universals, but the conclusion **59ᵃ1** in this figure is always particular, and so it is evident that it is not possible at all to prove the universal premise through this figure.

But if one premise is universal and one particular, sometimes it can be done and sometimes it cannot. When both premises are taken as affirmative, then, and the universal is with the minor extreme, it can be done; but when it is with the other extreme, it cannot be. For let A belong to every C and B belong to some C (the conclusion is AB). Therefore, if C is taken to belong to every A, it has been proved that C belongs to some B, but it has not been proved that B belongs to some C. And yet it is necessary that if C belongs to some B, B also belongs to some C. However, it is not the same thing for this to belong to that and for that to belong to this. Instead, it

99. Retaining τῷ δὲ Γ μηδενί.

must be supposed in addition that if this belongs to some of that, that also belongs to some of this. But when this premise has been taken, the deduction no longer comes about from the conclusion and the other premise. But if B belongs to every C and A to some C, premise AC can be proved if C is supposed to belong to every B and A to some B. For if C belongs to every B and A to some B, it is necessary for A to belong to some C (B is the middle). And when one premise is positive, the other premise is privative, and the positive premise is universal, the other premise can be proved. For let B belong to every C, and let A not belong to some C (the conclusion is that A does not belong to some B). Then, if it is supposed in addition that C belongs to every B, it is necessary for A not to belong to some C (B is the middle). But when the privative premise is universal, the other premise cannot be proved, unless, as in the previous cases, it is supposed that this term belongs to some of what the other does not belong to some of—for example, if A belongs to no C and B belongs to some C (the conclusion is that A does not belong to some B). Therefore, if it is supposed that C belongs to some of what A does not belong to some of, it is necessary for C to belong to some B. Otherwise the other premise cannot be proved by converting the universal premise; for there will not be a deduction at all.

{It is evident, then, that in the first figure, reciprocal proof comes about both through the third figure and through the first. For when the conclusion is positive, the proof is through the first figure, but when the conclusion is privative it is through the last (for it is taken that what this belongs to none of, the other belongs to all of). And in the middle figure, when the deduction is universal, reciprocal proof is both through the same figure and through the first; but when the deduction is particular, it is through both the same and the last. And in the third figure, all reciprocal proofs are through the same figure. It is also evident that in the third and the middle figures, the deductions which do not come about through the same figure are either not in accord with circular proof or are incomplete.}[100]

2.8
Converting Deductions: First Figure

To convert is to make a deduction either that the [first] extreme does not belong to the middle term, or that the middle term does not belong to the last extreme, by reversing the conclusion. For if the conclusion is converted and one premise remains, it is necessary for the remaining premise to be done away with (for if that premise is so, the conclusion will be as well). But it makes a difference whether we convert the conclusion oppositely or contrarily; for the same deduction does not come about when it is converted in each way (but this will be clear through what follows). I say that "to every" is the opposite of "not to every," and "to some" is the opposite of "to

100. Secluded as probably inauthentic.

none," and I say that belonging "to every" converts contrarily with "to none," and "to some" with "not to some."

For let A have been proved of C through middle term B. If A is supposed to belong to no C and to every B, B will belong to no C. And if A is supposed to belong to no C and B to belong to every C, A will not belong to every B (but not simply to none; for a universal was not proved through the last figure). In general, the premise with the major extreme cannot be disestablished universally through conversion; for it is always done away with through the third figure. For it is necessary to take both the premises as relating to the last extreme term. And likewise if the deduction is privative. For let it have been proved through B that A belongs to none of the Cs.[101] Then, if A is supposed to belong to every C and to no B, B will belong to none of the Cs.[102] And if A and B are taken to belong to every C, A will belong to some B (but it belonged to none).

But if the conclusion is converted oppositely, the deductions will also be opposite, not universal (for one premise always becomes particular, so that the conclusion will also be particular). For let the deduction be positive, and let it be converted in this way. Then, if A does not belong to every C but belongs to every B, B will not belong to every C; and if A does not belong to every C but B does, A will not belong to every B. And similarly if the deduction is privative. For if A belongs to some C and to no B, B will not belong to some C (not simply to none); and if A belongs to some C and B to every C (which was taken originally), A will belong to some B.

In the case of the particular deductions, when the conclusion is converted oppositely both premises are done away with; but when it is converted contrarily, neither premise is (for doing away with it through conversion (with the conclusion falling short) [of a universal] no longer follows, as it did in the case of universal deductions, but instead it does not follow that anything is done away with at all). For let A have been proved of some C. Then if A is supposed to belong to no C and B to some, A will not belong to some B; and if A is supposed to belong to no C and to every B, B will belong to no C. Consequently, the premises are both done away with. But if it is converted contrarily, neither premise is done away with. For if A does not belong to some C and belongs to every B, B will not belong to some C, but the initial thing has still not been done away with (for it is possible to belong to some and not to belong to some). But no deduction of AB, the universal premise, comes about at all. For if A does not belong to some one of the[103] Cs and B does belong to some one of the Cs, neither of the premises is universal. And similarly if the deduction is privative. For if A is taken to belong to every C, the premises are both done away with, while if it is taken to belong to some, neither premise is (the demonstration is the same).

101. Reading τῶν Γ
102. Reading τῶν Γ.
103. Reading τῶν Γ.

2.9
Converting Deductions: Second Figure

In the second figure, the premise with the major extreme cannot be done away with contrarily, regardless of which sort of conversion we use. For the conclusion will always be in the third figure, and there was no universal deduction in that. However, we can do away with the other premise similarly by conversion. (By "similarly," I mean contrarily if the conclusion is converted contrarily and oppositely if it is converted oppositely.) For let A belong to every B and to no C (the conclusion is BC). Therefore, if B is taken to belong to every C and premise AB remains, A will belong to every C. For it becomes the first figure. And if B is taken to belong to every C and A to no C, A will not belong to every B (the figure is the last). But if BC is converted oppositely, premise AB can be proved similarly and premise AC oppositely. For if B is supposed to belong to some C and A to no C, A will not belong to some B. Next, if B belongs to some C and A to every B, then A belongs to some C (so that the opposite deduction results). And it can be proved similarly if the premises are in the reverse relation.

But if the deduction is particular, when the conclusion is converted contrarily neither of the premises is done away with (as they also were not in the first figure), but when the conclusion is converted oppositely, both premises are. For let A be put as belonging to no B and to some C (the conclusion is BC). Then if B is put as belonging to some C and premise AB remains, the conclusion will be that A does not belong to some C, but the initial thing has not been done away with (for it is possible to belong to some and not belong to some). Next, if B is supposed to belong to some C and A to some C, there will not be a deduction (for neither of the premises taken is universal), so that AB is not done away with. However, if it is converted oppositely, **$60^{b}1$** both premises are done away with. For if B is taken to belong to every C and A to belong to no B, A will belong to no C (but it belonged to some). Next, if B belongs to every C and A to some C, A will belong to some B. There is the same demonstration if the universal premise is positive.

2.10
Converting Deductions: Third Figure

In the third figure, when the conclusion is converted contrarily, neither of the premises is done away with in any of the deductions; but when it is converted oppositely, both premises are done away with, and in all of the deductions. For let A have been proved to belong to some B, let C be taken as middle term, and let the premises be universal. Then, if A is supposed not to belong to some B and B to belong to every C, no deduction of A and C comes about. Nor will there be a deduction of B and C if A does not belong to some B and belongs to every C.

And it can be proved similarly if the premises are not universal. For either it is necessary for both premises to be particular because of the conversion, or the universal is with the minor extreme, and there was no deduction in this way in either the first figure or the middle. But if it is converted oppositely, both premises are done away with. For if A belongs to no B and B to every C, then A will belong to no C. Next, if A belongs to no B and to every C, then B will belong to no C. And likewise if one premise is not universal. For if A belongs to no B and B to some C, A will not belong to some C; and if A belongs to no B and to every C, then B will belong to no C.

And similarly if the deduction is privative. For let A have been proved not to belong to some B, and let BC be positive and AC negative (for this is the way a deduction came about). Then, when the contrary of the conclusion is supposed, there will not be a deduction. For there was no deduction of A and C if A belonged to some B and B to every C, there was no deduction of A and C. Nor was there a deduction of B and C if A to some B and to no C. Consequently, the premises are not done away with. But when the opposite is, they are done away with. For if A to every B and B to every C, then A to every C: but it belonged to none. Next, if A to every B and to no C, then B to no C (but it belonged to every C). And it is proved similarly if the premises are not universal. For AC becomes both universal and privative, while the other [premise] is particular and positive. Therefore, if A to every B and B to some C, A to some C follows (but it belonged to none). Next, if A to every B and to no C, then B to no C (but it was supposed that it belongs to some). If A to some B and B to some C, no deduction comes about. Nor if A is taken to belong to some B and to no C either. So, the premises are done away with in the former way but not in the latter.

It is therefore evident through what has been said how a deduction comes about in each of the figures when the conclusion is converted, and when it is contrary to the premise and when opposite; also, that in the first figure the deductions come about through the middle figure and the last, and that the premise with the minor extreme is always done away with through the middle figure and the premise related to the major extreme rejected through the last figure; that in the second figure, the deductions come about through the first and the last figures; that the premise with the minor extreme is always done away with through the first figure and the premise with the major extreme through the last; that in the third figure, the deductions come about through the first and the middle figures, and the premise with the major extreme is always done away with through the first figure and the premise with the minor extreme through the middle figure. It is evident, then, what converting is, and how it is possible in each figure, and what deduction comes about.

2.11
Deduction through the Impossible: First Figure

A deduction through the impossible is proved when the contradictory of the conclusion is put [as a premise] and one of the premises [of the deduction] is taken in addition. This comes about in all the figures; for it is like conversion but differs in that it is converting when a deduction has already come about and both the premises have been taken, while it is reduction to the impossible not when the opposite has previously been agreed to but when it is obvious that it is true. The terms are similarly related in both, and the way of taking premises is the same for both. For example, if A belongs to every B and C is the middle, if A is assumed to belong either not to every B, or to none, and to belong to every C (which was [assumed as] true), it is necessary that C belongs either to no B or not to every B. But this is impossible; consequently, what was assumed is false. Therefore, its opposite is true. And similarly in the other figures. For whatever deductions admit of conversion also admit of deduction through the impossible.

The other problems, then, are all proved through the impossible in all the figures, but a universal positive conclusion is proved in the middle and the third figures but not proved in the first. For let A be assumed not to belong to every B, or to belong to none, and let the other premise be taken in addition from one side or the other, either that C belongs to every A or that B belongs to every D (for in that way it will be the first figure). Then if A is assumed not to belong to every B, a deduction does not come about, no matter which side the premise is taken from, but if A is assumed to **61^b1** belong to no B, when premise BD is supposed in addition there will be a deduction of a falsehood, but what was proposed is not proved. For if A belongs to no B and B to every D, A will belong to no D. But let this be impossible: it is then false that A belongs to no B. But it is not the case that if "to none" is false then "to every" is true. And if a premise CA is supposed in addition, a deduction does not come about, nor when A is assumed not to belong to every B. It is therefore evident that "belongs to every" is not proved through the impossible in the first figure.

But "belongs to some" and "belongs to none" and "does not belong to every" are proved. For let A be assumed to belong to no B, and let B be supposed to belong to every or to some C. Then it is necessary that A belongs to no C or not to every C. But this is impossible—for let it be true and evident that A belongs to every C—so that if this is false, it is necessary that A belongs to some B. However, if the other premise is taken as attached to A, there will not be a deduction, nor will there be one when the contrary of the conclusion—that is, that A does not belong to some B—is assumed. It is evident, then, that it is the opposite [of the conclusion] that must be assumed.

Next, let A be assumed to belong to some B, and let C be supposed to belong to every A. It is then necessary for C to belong to some B. But let this be impossible, so that what was assumed is false. In that case, that it belongs to none is true. And similarly if CA is supposed as privative. But if the premise attached to B was supposed,

there will not be a deduction. And if the contrary should be assumed, there will be a deduction and something impossible will result, but what was proposed is not proved. For let A be assumed to belong to every B, and let C be supposed to belong to every A. Then, it is necessary that C belongs to every B. But this is impossible; consequently, it is false that A belongs to every B. However, if it does not belong to every, it is still not necessary that it belongs to none. And similarly if the other premise is taken as attached to B. For there will be a deduction and something impossible, but the hypothesis is not done away with. Consequently, it is the opposite that must be assumed.

In order to prove that A does not belong to every B, it must be assumed that it belongs to every. For if A belongs to every B and C to every A, C will belong to every B, so that if this is impossible, what was assumed is false. And similarly if the other premise was supposed as attached to B. Likewise if CA was privative, for a deduction also comes about in this way. However, if the privative premise is attached to B, nothing is proved. And if A was assumed to belong to some rather than to every B, it is not proved that it does not belong to every, but rather that it belongs to none. For if A is taken to belong to some B and C to belong to every A, C will belong to some B. So if this is impossible, it is false that A belongs to some B, so that it is true that it belongs to none. But if this is proved, then something true is also done away with (for A belonged to some B and did not belong to some). In addition, neither does the impossibility follow depending on the hypothesis.[104] For the hypothesis would then be false, since it is impossible to deduce something false from true premises, while in fact it is true (for A belongs to some B). Consequently, it must be assumed, not that it belongs to some, but that it belongs to every. And similarly if we want to prove that A does not belong to some B. For if not to belong to some and not to belong to every are the same, there will be the same demonstration for them both.

It is evident, then, that it is not the contrary but rather the opposite that must be assumed in all these deductions. For in this way there will be a necessary result, and what is claimed will be accepted. For if either the affirmation or the negation is true of everything, when it is proved that the negation is not true, it is necessary for the affirmation to be true. Moreover, if someone does not suppose the affirmation to be true, it is acceptable to claim the negation. To claim the contrary, however, is not appropriate either way. For neither is it necessary for "belongs to every" to be true if "belongs to none" is false, nor is it acceptable that if the one is false then the other is true.

2.12
Deduction through the Impossible: Second Figure

It is evident, then, that in the first figure all the other problems are proved through the impossible but the universal positive is not so proved. But in the middle and the

104. Reading οὐ παρὰ τὴν ὑπόθεσιν συμβαίνει τὸ ἀδύνατον.

last figures, this problem is proved as well. For let A be assumed not to belong to every B, and let A be supposed to belong to every C. So then, if A does not belong to every B and belongs to every C, then C will not belong to every B. But this is impossible—for let it be evident that C belongs to every B—so that the assumption is false. Therefore, it is true that A belongs to every B. But if the contrary is assumed, there will be a deduction and an impossibility, but yet what was proposed is not proved. For if A belongs to no B and to every C, then C will belong to no B. But this is impossible, so that it is false that it belongs to none. However, it is not the case that if that is false, it is true that C belongs to every B.

To prove that A belongs to some B, let A be assumed to belong to no B, and let it belong to every C. Then it is necessary for C to belong to no B. Consequently, if this is impossible, it is necessary that A belongs to some B. And if it is assumed not to belong to some B, the results will be the same as in the first figure.

Next, let A be assumed to belong to some B, and let it belong to no C. It is then necessary that C does not belong to some B. But it belonged to every one, so that what was assumed is false. Therefore, A will belong to no B.

To prove that A does not belong to every B, let it be assumed to belong to every B and to no C. It is then necessary for C to belong to no B. But this is impossible; consequently, that A does not belong to every B is true. It is evident, then, that all the deductions can come about through the middle figure. **$62^{b}1$**

2.13
Deduction through the Impossible: Third Figure

And similarly through the last figure. For let A be taken not to belong to some B and to belong to every C. Therefore, A does not belong to some C. If this is impossible, it is false that A does not belong to some B, and consequently true that it belongs to every B. But if A is assumed to belong to no B, although there will be a deduction and something impossible will follow, what was proposed is not proved (for if the contrary is assumed, the results are the same as in the previous cases). Instead, this hypothesis must be chosen for proving that A belongs to some B. For if A belongs to no B and C to some B, then A will not belong to every C. Therefore, if this is false, it is true that A belongs to some B.

And to prove that A belongs to no B, let it be assumed that it belongs to some, and let C be supposed as belonging to every B. Then it is necessary for A to belong to some C. But it belonged to none; consequently, it is false that A belongs to some B. However, if A is assumed to belong to every B, what was proposed is not proved. That hypothesis must be taken instead for proving that A does not belong to every B. For if A belongs to every B and C to every B, then A belongs to some C. But this was assumed not to be so; consequently, it is false that it belongs to every B. And if this is so, it is true that it does not belong to every B. If it is assumed to belong to some, the results will be the same as what was said previously.

It is evident, then, that in all deductions through the impossible it is the opposite that must be assumed. It is also clear that an affirmative is, in a way, proved in the middle figure and a universal in the last.

2.14
Comparison of Probative and Through-the-impossible Demonstration

Demonstration to the impossible differs from probative demonstration in that it puts as a premise what it intends to do away with by reducing to an agreed falsehood, while a probative demonstration begins from agreed suppositions. More precisely, both demonstrations take two agreed premises, but one takes the premises that the deduction is from while the other takes one of these premises and, as the other premise, the contradictory of the conclusion. Also, in the former case it is not necessary for the conclusion to be known or even supposed in advance to be so or not, while in the latter case it is necessary to assume in advance that it is not so. It makes no difference whether the conclusion is an affirmation or a negation, but rather it is similar concerning both sorts of conclusion.

Everything concluded probatively can also be proved through the impossible, and everything proved through the impossible can be concluded probatively, through the same terms. For when the deduction comes about in the first figure, the true
63ᵃ1 conclusion will be in the middle figure or the last (a privative conclusion in the middle figure and a positive conclusion in the last). When the deduction is in the middle figure, the true conclusion is in the first figure for all the problems. When the deduction is in the last figure, the true conclusion will be in the first or the middle figure (affirmative conclusions in the first figure and privatives in the middle). For let A have been proved of no B, or not of every B, through the first figure. The hypothesis, then, was that A belongs to some B, and C was supposed to belong to every A and to no B (for that is how the deduction and the impossibility came about). But this is the middle figure: "if C belongs to every A and to no B"; and it is evident from these premises that A belongs to no B. And similarly if it has been proved that it does not belong to every B. For the hypothesis is that it belongs to every B, and C was supposed to belong to every A and not to every B. Likewise if CA is supposed as privative (for the middle figure comes about that way as well). Next, let A have been proved as belonging to some B. The hypothesis, then, is that it belongs to none, and B was taken to belong to every C and A to belong either to every or to some C (for in this way there will be an impossibility). But this is the last figure: "if A and B to every C"; and it is evident from these premises that it is necessary for A to belong to some B. Similarly if either B or A is supposed to belong to some C.

Next, in the middle figure, let A have been proved to belong to every B. The hypothesis then was that A does not belong to every B, and A was supposed to belong to every C and C to every B (for this is how there will be an impossibility). But this is

the first figure: "A to every C and C to every B." And similarly if A has been proved to belong to some B. For the hypothesis was that A belongs to no B, and A was supposed to belong to every C and C to some B. If the deduction is privative, the hypothesis is that A belongs to some B, and A is supposed to belong to no C and C to every B, so that it becomes the first figure. Likewise if the deduction is not universal and A has instead been proved not to belong to some B. For the assumption was that A belongs to every B, and A was supposed to belong to no C and C to some B (for in this way it is the first figure).

Next, in the third figure, let A have been proved to belong to every B. The hypothesis, therefore, was that A does not belong to every B, and C was supposed to belong to every B and A to every C (for that is how there will be an impossibility). But this **$63^{b}1$** is the first figure. And likewise if the demonstration is particular. For the hypothesis was that A belongs to no B, and C was supposed to belong to some B and A to every C. If the deduction is privative, the hypothesis was that A belongs to some B, and C was supposed to belong to no A and to every B (but this is the middle figure). And similarly if the demonstration is not universal. For the hypothesis will be that A belongs to every B, and C was supposed to belong to no A and to some B (but this is the middle figure).

It is evident, then, that each problem can also be proved probatively through the same terms. Similarly, when deductions are probative, it will also be possible to reduce them to the impossible using the terms taken when the premise opposite to the conclusion is supposed. For the same deductions come about as through conversion; consequently, we also know at once the figure through which each one will be possible. It is clear, then, that every problem can be proved in both ways, through the impossible as well as probatively, and that it is not possible to separate one of them off.

2.15
Deductions from Opposite Premises

In which figures it is possible to deduce from opposite premises, and in which figures it is not, will be evident in what follows.

I say that verbally there are four [pairs of] opposite premises: "to every" and "to no," "to every" and "not to every," "to some" and "to no," and "to some" and "not to some." In truth, however, there are three, for "to some" and "not to some" are only opposites verbally. Among these, I call the universal premises "contraries" ("to every" is contrary to "to none," as, for example, "every science is excellent" is contrary to "no science is excellent"), and the other pairs of premises "opposites."

In the first figure, then, there cannot be a deduction from opposite premises, whether affirmative or negative. There cannot be an affirmative deduction because both premises must be affirmative, whereas opposite premises are an affirmation and

negation. There cannot be a privative deduction, on the other hand, because opposite premises predicate and deny the same thing of the same thing, but the middle term in the first figure is not said of both extremes; rather, one is denied of it and it is predicated of the other, and such premises are not opposed.

But in the middle figure, it is possible for a deduction to come about both from opposite and from contrary premises. For let A stand for good and B and C for **64ᵃ1** science. If someone supposed every science to be good[105] and also no science to be good—A belongs to every B and to no C—so that B belongs to no C: no science, therefore, is a science. Similarly if, supposing every science to be excellent he supposed medicine not to be excellent. For A belongs to every B and to no C, so that a particular science will not be a science. And if A to every C and to no B, and B is science, C medical science, and A supposition. For while supposing no science to be supposition, he has supposed some science to be supposition. This differs from the previous case because of the conversion of the terms: previously, the affirmative was with B, but now it is with C. And likewise if one premise or the other is not universal. For the middle will always be what is said negatively of one extreme and affirmatively of the other. Consequently, it is possible for opposites to give a conclusion; not always or in all ways, however, but if the terms below the middle are so related that they are either the same or as a whole to a part. Otherwise, it is impossible, for the premises will be neither contraries nor opposites at all.

In the third figure, there can never be an affirmative deduction from opposite premises due to the cause also stated in application to the first figure, but there can be a negative deduction both when the terms are universal and when they are not universal. For let B and C stand for science and A for medicine. Therefore, if someone takes all medicine to be a science and no medicine to be a science, he has supposed B to belong to every A and to no C, so that some science will not be a science. And similarly if premise BA is supposed as not universal. For if some medicine is a science and next no medicine is a science, it follows that some science is not a science. When the terms are supposed as universal, the premises are contrary, but when one or the other term is particular, the premises are opposites.

We should notice here that although it is possible to assume opposites this way (as we said every science is good and then said no science is good, or that some science is not), this ordinarily does not escape our notice. But it is also possible to deduce one or the other of them through different questions or to obtain it as was said in the *Topics*.[106]

Since there are three oppositions of affirmations, it follows that opposites can be supposed in six ways: "to every" and "to no," or "to every" and "not to every," or "to some" and "to no," and next converting this with respect to the terms (for **64ᵇ1** example, supposing A to belong to every B and to no C, or to every C and to no B; or

105. In this argument Aristotle unusually uses two different, but often synonymous, words (*agathos* and *spoudaios*) for term A.
106. 163ᵃ14–28.

supposing it to belong to all of one and not to all of the other, and again converting this with respect to the terms). And similarly in the third figure. Consequently, it is evident both in how many ways and in which figures it is possible for a deduction through opposite premises to come about.

It is also evident that while it is possible to deduce a true conclusion from falsehoods (as was said previously[107]), it is not possible to do so from opposite premises. For the [conclusion of the] deduction will always be contrary to the subject matter—as not being good, if it is good, or not being an animal, if it is animal—because the deduction is from a contradiction, and the subject terms are either the same or one is a whole and the other a part. And it is clear that in fallacies nothing prevents the contradictory of the hypothesis from coming about—for example, that it is not odd if it is odd. For from opposite premises, a contrary was deduced; so, if such premises are supposed, the contradictory of the hypothesis will follow.

But we must take note that it is not possible to conclude contraries from a single deduction in this way so as to get as the conclusion that what is good is not good, or something else of this sort, unless the premise of this sort is taken directly—for example, "every animal is white and not white, and a human is an animal." Instead, either one must also take the contradictory (that is, that every science is supposition), and next take as premises that medicine is a science and that no medicine is supposition, in the way that refutations happen—or else get the contradiction from two deductions. But to take them so that the things supposed are in truth contraries is not possible in any other way than this, as was said previously.

2.16
Asking for the Initial Thing

Asking for or assuming the initial thing is, to put it in a kind, a matter of not demonstrating what was proposed. But that happens in many ways: if one entirely fails to deduce, or if one does deduce but through [premises] more unknowable [than what was proposed] or equally unknowable [as it is], or if one deduces what is prior through what is posterior (for a demonstration is through what is both more persuasive and prior). None of these, then, is asking for the initial thing. However, given that some things are of such a nature as to be known through themselves and some are of such a nature as to be known through others—that is, the starting-points are known through themselves and those below the starting-points are known through other things—therefore, whenever someone tries to prove through itself what is not knowable through itself, he is asking for the initial thing.

This can be done in such a way as to claim directly what was proposed, but it is also possible to do it by transferring the argument over to other premises that are of such

107. 2.2–4.

a nature as to be proved through the initial thing and demonstrating the initial thing through them—for example, if A is proved through B and B through C, but C is of such a nature as to be proved through A; for the result is that those who deduce in this way prove A through itself. This is precisely what those who think they construct proofs that there are parallels do; for they do not notice that they themselves suppose premises that it is not possible to demonstrate if there are no parallels. Thus, it follows for those who deduce in this way that they are saying a given thing is so if it is so. But in that way everything would be knowable through itself, which is impossible.

So then, if someone should ask for the premise that A belongs to B when it is not clear that A belongs to C and equally unclear that it belongs to B, although it is not yet clear whether he is asking for the initial thing, he is clearly not demonstrating (for what is equally unclear is not the starting-point of a demonstration). However, if B is so related to C as to be the same, or if it is clear that they convert or that one belongs[108] to the other, he is asking for the initial thing. For he could also prove that A belongs to B through those terms, if he converted it (this is what actually prevents him, not the way it is proved). But if he did this, he would do what was said and convert the three of them. And likewise, if he were to suppose that B belongs to C, though that was as unclear as that A did, he would not yet be asking for the initial thing, but he is not demonstrating. However, if A is the same as B because A either converts with it or follows it, then he is asking for the initial thing, due to the same cause. For it was said what "asking for the initial thing" means for us: it is proving through itself what is not clear through itself.

Therefore, if asking for the initial thing is proving through itself what is not clear through itself—which is to say, not proving—then if what is being proved and what someone is proving it through are equally unclear, either because the same things belong to the same thing or because the same thing belongs to the same things, it will be possible to ask for the initial thing both ways in the middle figure and in the third, and in a positive deduction in both the third figure and the first. When the conclusion is deduced negatively, it is possible when the same things are denied of the same, though not possible for both the premises similarly, because the terms do not convert with respect to negative deductions (and likewise in the middle figure). In demonstrations, it is asking for the initial thing when the premises are so related in truth, but in dialectical arguments when they are so related in accord with belief.

2.17
"Falsehood Not Because of This"

"The falsehood does not follow depending on this"—something we often have occasion to say in arguments—is, to begin with, something that occurs in connection with deductions to the impossible, where it is said in relation to the contradiction of

108. Reading ὑπάρχει.

what was proved by reduction to the impossible. For unless the argument had come to a contradiction, no one would say "not depending on this," but rather that something false was put among the previous suppositions. Nor will anyone say it of a probative demonstration, for that does not suppose what it contradicts. Moreover, when something is done away with probatively through ABC, it cannot be said that the deduction has not come about because of what was supposed. For we say "it does not come about depending on this" when, although "this" is done away with, the deduction nonetheless comes to a conclusion, and that is precisely what is not possible in probative deductions (for when the hypothesis has been done away with, the deduction related to it will no longer exist). It is evident, then, that "not depending on this" is said in deductions to the impossible and when the initial hypothesis is so related to the impossibility that, whether this hypothesis is or is not made, the impossibility nonetheless follows. **65b1**

The most obvious way for the false conclusion not to be dependent on the supposition, then, is when the deduction from the middle terms to the impossibility is unconnected with the hypothesis (which was also said in the *Topics*).[109] For this is what putting a non-cause as the cause is. For example, if someone intending to prove that the diagonal is incommensurable makes use of Zeno's argument that it is not possible to move and leads the argument to this impossibility. For the falsehood is not connected in any way at all to the initial assertion.

Another way is if the impossibility is connected to the hypothesis but nonetheless does not follow through it. For it is possible for this to happen when taking something connected either upward or downward. For example, if A is put as belonging to B, B to C, and C to D, and this statement, "B belongs to D," is false. For if B nonetheless belongs to C, and C to D, when A is taken away, the falsehood would not be through the initial hypothesis. Or next, if someone takes something connected upward, for example, taking A to belong to B, E to A, and F to E, and it is false that F belongs to A. For in this way as well, the impossibility will nonetheless result if the initial hypothesis is done away with.

The impossibility must instead be connected to the initial terms. For this is the way it will be through the hypothesis: in the downward direction, taking something connected to the term that is predicated (for if it is impossible for A to belong to D, then, when A is taken away there will no longer be a falsehood); or in the upward direction, taking something connected to that term of which the other is predicated (for if it is not possible for F to belong to B, then when B is taken away the impossibility will no longer result). And similarly also when the deductions are privative.

It is evident, then, that when the impossibility is not related to the initial terms, the falsehood does not follow depending on the assumption. Or rather, even in this way, might the falsehood not always result through the hypothesis? For if A was put as belonging, not to B, but to K, and K to C, and this to D, in this way also **66a1**

109. *SE* 167^b21–36 (Aristotle always cites *SE* as part of *Top.*).

the impossibility remains (and similarly also when taking the terms upward); consequently, since the impossibility results both when this is so and when it is not, it would not be dependent on the assumption. Or should we take "when this is not so the falsehood comes about nonetheless" not in this sense, that when something *else* is supposed the impossibility follows, but rather that when this is taken away the *same* impossibility is concluded through the remaining premises? For it is really not absurd for the same falsehood to result through several hypotheses, as, for example, it results that parallels intersect both if the internal angle is greater than the external and if a triangle has more than two right angles.

2.18
The Cause of a False Conclusion

A false argument happens because of its first falsehood. For every deduction is either from two premises or from more. If it is from two premises, then, it is necessary for one of these (or both) to be false (for a false deduction, as we saw,[110] is not possible from true premises). But if it is from more premises (for example, if C is deduced through AB and these are deduced through DEFG), among these higher things one will be false and, depending on it, the argument will be as well (for A and B are concluded through them). Consequently, the conclusion—that is, the falsehood—follows depending on one of these.

2.19
Watch for the Repeated Term When Debating

In order to avoid being argued down in deducing, be on the lookout, whenever someone is asking for premises in an argument without conclusions, against the same term being conceded twice in the premises, since we know that a deduction does not come about without a middle, and the middle is what is said multiple times. The way we must watch out for the middle with each sort of conclusion is evident because we know what sort is proved in each figure. We will not overlook this because we know how we are defending the argument.

When we are attacking, we should ourselves try to get away with the very thing we are warning to guard against when in the answering role. This will be possible if, first, the conclusions are not deduced in advance and are not obvious when the necessary premises have been obtained; next, if one does not ask for premises close in order, but as far as possible immediate. For example, let it be required to conclude A of F (the middle terms are BCDE). So, we should ask whether A belongs to B; next,

110. 53[b]11–25.

not whether B belongs to C, but whether D belongs to E; next after that, whether B belongs to C, and so on for the rest. And if the deduction comes about through a single middle term, we should begin from the middle term; for in this way the answerer will be most likely not to notice. **$66^{b}1$**

2.20
When There Is, or Is Not, a Refutation

Since we know when a deduction comes about—that is, what relations the terms are in—it is also evident both when there will and when there will not be a refutation. For it is possible for there to be a refutation either when everything asked gets an affirmative response or when the answers are given alternately (that is, one negative and the next affirmative). For there was a deduction when the terms were related both in the latter way and in the former. Consequently, if what is supposed is contrary to the conclusion, there is necessarily a refutation (for a refutation is the deduction of a contradiction). But if nothing should get an affirmative response, it is impossible for there to be a refutation. For there was no deduction when all the terms were privative, so that there is not a refutation either (for if there is a refutation, necessarily there is a deduction, though when there is a deduction it is not necessary that there is a refutation). And likewise if nothing should be supposed to belong to something as a whole in the answer (for the definition of a refutation and of a deduction will be the same).

2.21
Being Misled by Inconsistent Suppositions

Sometimes it happens that, just as we are deceived by the arrangement of the terms, so also deception arises in what we think about them—for example, if it is possible for the same thing to belong primarily to several others but someone has forgotten about one of them and thinks the term belongs to none of it, while knowing that it belongs to another one. For let A belong to B and to C intrinsically, and these likewise to every D. If someone thinks that A belongs to every B and this to every D, but also that A belongs to no C and this to every D, he will have both knowledge and ignorance about the same thing in the same respect. Next, this is possible if someone should be deceived about terms from the same column. For example, if A belongs to B, this belongs to C, and C to D, but he thinks that A belongs to every B and next to no C (for he will at the same time both know that it belongs and think it does not). From these premises, then, could anything be expected to result except that he does not think that very thing which he knows? For in a way he knows that A belongs to C through B (that is, in the way we know the particular in virtue of the universal); consequently, what he knows in a way, he also claims not to think at all—which is impossible.

Concerning the case mentioned previously, if the middle term is not from the same column, it is not possible to think both the premises with respect to each of the middles (for example, to think that A belongs to every B and to no C and that these both belong to every D). For it follows that the first premise is supposed contrarily (either unconditionally or in part). For if he thinks that A belongs to everything B belongs to and knows that B belongs to D, he also knows that A belongs to D. So then next, if he thinks that A belongs to none of what C belongs to, he thinks that A does not belong to what B belongs to some of. But to think that something belongs to everything B belongs to and then in turn think it does not belong to something B belongs to is contrary, either unconditionally or in part.

It is not possible to believe in this way, then, but nothing prevents one from thinking one of the premises relative to each of the middle terms, or both premises relative to [only] one—for example, supposing that A belongs to every B and B to every D and A in turn to no C; for this sort of deception is similar to the way we are deceived about particular premises. For example, if A belongs to everything B belongs to and B to every C, A will belong to every C. Therefore, if someone knows that A belongs to everything B belongs to, he also knows that it belongs to C. But nothing prevents him from being ignorant that C exists—for example, if A is two right angles, B stands for triangle, and C stands for a perceptible triangle: someone could think that C does not exist while knowing that every triangle has two right angles, so that he will at the same time know and be ignorant of the same thing. For "knows of every triangle that it has angles equal to two right angles" does not have just one sense: one is in virtue of having universal scientific knowledge, but the other is in virtue of having the particular knowledge. Therefore, in this way—in virtue of the universal sort—he does know, of C, that it has two right angles, but he does not know it in virtue of the particular sort. Consequently, he will not possess contrary states of knowledge. The argument in the *Meno*[111] that learning is remembering is like this. For it never follows that we scientifically know the particular in advance, but instead that we get the scientific knowledge of the particulars at the same time through the induction, as if we were recognizing something. For there are some things which we know straightaway—for example, knowing that something is equal] to two right angles if we see that it is a triangle. And similarly in other cases.

By means of the universal scientific knowledge, then, we observe the particulars, but we do not know them in virtue of the scientific knowledge appropriate to them. It is therefore possible to be deceived about them, but not contrarily. Instead, it is possible to have the universal scientific knowledge but be deceived in virtue of[112] the particular sort. Therefore, it is the same in the cases mentioned previously; for deception concerning a middle term is not contrary to scientific knowledge in accord with a deduction, nor is supposition concerning either of the middles. But nothing prevents

111. Plato, *Meno* 80d5–8; also *APo*. 71ᵃ29–30.
112. Reading τῇ.

someone who knows both that A belongs to the whole of B and that this in turn belongs to C from thinking that A does not belong to C—for example, knowing that every female mule is infertile, and that this is a female mule, but thinking that this one is pregnant. For he does not scientifically know that A belongs to C if he does not have both of them in view together. Clearly, therefore, if he knows the one but does not know the other, he will have been deceived. This is precisely what the relation is of the knowledge of the universal sciences to the scientific knowledge of particulars. For we do not know any perceptible object once it is outside our perception, even if we do happen to have perceived it previously, unless it is in virtue of universal knowledge, that is, in virtue of possessing the scientific knowledge appropriate to it but not in virtue of activating it. For we are said "to know scientifically" in three ways: by means of universal scientific knowledge, by means of the scientific knowledge appropriate to something, or by means of our activating it, and we are said to be deceived, therefore, in just as many ways. Nothing then prevents one from both knowing and being deceived about the same thing, though not contrarily. And this is precisely what happens to the person who knows the premise in accord with one of the sorts of knowledge but has not previously reflected on it. For in thinking that the female mule is pregnant, he does not possess scientific knowledge in the sense of activating it, but at the same time his deception through that thought is not contrary to his scientific knowledge, for a deception contrary to universal knowledge is a deduction.

Someone who thinks that the being for good is the being for bad will think that the being for good is the same as the being for bad. For let A stand for the being for good, B stand for the being for bad, and C again stand for the being for good. Then, since he thinks that B and C are the same, he will think that C is B, and next that B likewise is A, so that he will also think C is A. For just as if it were true that B is predicated of what C is predicated of, and A is predicated of what B is predicated of, it would also be true that A is predicated of C, so also in the case of thinking. And similarly also in the case of being [the same as]: for if C and B are the same, as again are B and A, C would also be the same as A. Consequently, it will be the same also in the case of thinking. Is this then necessary, if someone grants the first thing? But perhaps this is false, that someone thinks the being for good is the being for bad, unless coincidentally (for it is possible to think this in many ways). This must be investigated better.

2.22
On the Conversion of Terms

When the extremes convert, it is necessary that the middle also converts with both of them. For if A is proved to belong to C through B, and if it converts—that is, C belongs to everything that A does—B also converts[113] with A, that is, B will belong

113. Reading ἀντιστρέφει here and in the next sentence.

to everything A belongs to through middle term C. And C converts with B through A as the middle term.

Likewise in the case of not belonging. For example, if B belongs to C and A does not belong to B, neither will A belong to C. But if B converts with A, C will also convert with A. For let B not belong to A: therefore, neither will C (for B belonged to every C). And if C converts with B, A will also convert with it (for whatever B is true of all of, C is also true of that). And if C converts with[114] A, B also converts[115] with it. For whatever B belongs to, C belongs to, but whatever A belongs to, C does not belong to. (This case alone begins from the conclusion, while the other cases do not, as in the case of a positive deduction.)

Next, if A and B convert, and C and D likewise, and it is necessary for either A or C to belong to everything, B and D will be so related that one or the other of them belongs to everything. For since B belongs to what A belongs to, and D belongs to what C belongs to, and either A or C belongs to everything but not both of them together, it is also evident that either B or D belongs to everything but not both of them together (for here two deductions are combined). Next, if either A or B and either C or D belong to everything, but they cannot both belong at the same time, if A and C convert, B and D also convert. For if B does not belong to something D belongs to, A clearly does belong to it; and if A belongs to it, C does too (for they convert). Consequently, C and D will belong to it together. But that is impossible. For example, if what is incapable of coming to be is incapable of passing away and what is incapable of passing away is incapable of coming to be, it is necessary that what comes to be is capable of passing away and that what is capable of passing away comes to be.[116]

But when A belongs to the whole of B and of C, and it is predicated of nothing else, and B also belongs to every C, it is necessary that A and B convert. For since A is said only of B and C, and B is predicated both of itself and of C, it is evident that B will also be said of all that A is said of except for A itself. Next, when A and B belong to the whole of C and C converts with B, it is necessary that A belongs to every B. For since A belongs to every C and C belongs to B (because they convert), A also belongs to every B.

When A and B are two opposites of which A is more choiceworthy than B, and D is likewise more choiceworthy than C, then if [the combination] AC is more choiceworthy than [the combination] BD, A is more choiceworthy than D. For A is as much to be pursued as B is to be avoided (for they are opposites), and C is similarly related to D (for these are also opposites). Therefore, if A is equally as choiceworthy as D, B is equally to be avoided as C (for each is similarly related to each, what is to be pursued to what is to be avoided). Consequently, the both of them (AC) would

114. Rejecting the addition of καὶ.
115. Reading ἀντιστρέφει.
116. The Bekker text of this paragraph is reorganized as indicated.

be equally so as BD. But since A is in fact more choiceworthy [than D], it cannot be equally to be avoided [as D]. For then, BD would also be equally choiceworthy [as AD]. And if D were more choiceworthy than A, B would be less to be avoided than C (for the lesser is opposed to the lesser). And the greater good and lesser bad is more choiceworthy than the lesser good and greater bad; therefore, the combination, BD, would be more choiceworthy than AC. But in fact it is not. Therefore, A is more choiceworthy than D, and thus C is less to be avoided than B.

So, if every lover would choose, when it comes to his beloved, for him to be of such a sort as to grant [sexual] favors (A) without granting them (which C stands for) than for him to grant favors (which D stands for) without being of such a sort as to grant them (which B stands for), it is clear that A (being of such a sort) is more choiceworthy than granting favors. To be loved, therefore, is more choiceworthy than sexual intercourse, when it comes to his beloved. Therefore, love is more for friendship than for sexual intercourse. But if it is most of all for this, that is its end. Therefore, sexual intercourse is either not the end at all or is so for the sake of being loved. The other appetites and crafts are also like this.

2.23
The Figures Apply in Rhetoric and Everywhere Else

It is evident, then, how terms are related with respect to conversions and with respect to being more choiceworthy or more to be avoided. But now we must explain that not only do dialectical and demonstrative deductions come about through the figures previously mentioned, but so also do rhetorical ones and, in a word, any means of persuasion whatever in accord with whatever methodical inquiry.

We come to be persuaded about anything either through deduction or from induction. Induction, then—that is, a deduction from induction—is deducing one extreme to belong to the middle through the other extreme. For example, if B is the middle for AC, proving A to belong to B through C (for this is how we produce inductions). For example, let A be long-lived, B stand for not having bile, and C stand for the long-lived particular, such as a human, a horse, or a mule. A belongs to the whole C (for everything bileless[117] is long-lived); but B (not having bile) belongs to every C. Then, if C converts with B and the middle term does not extend beyond the extreme, it is necessary for A to belong to B. For it was proved earlier[118] that if two terms belong to the same thing and the extreme converts with one of them, the other one of the predicates will also belong to the term that converts with it. (But one must understand C as composed of every one of the particulars; for induction is through them all.)

117. Reading ἄχολον.
118. $68^{a}16–25$.

This is the sort of deduction there is of a first—that is, immediate—premise: for the deduction of those things of which there is a middle term is through that middle term, but the deduction of those of which there is no middle term is through induction. And in a way, induction is the opposite of deduction. For deduction proves the first extreme to belong to the third term through the middle, whereas induction proves the first extreme to belong to the middle through the third. By nature, therefore, the deduction through the middle term is prior and better known, but the deduction through induction is more obvious to us.

2.24
Paradigms

It is a paradigm when the [first] extreme is proved to belong to the middle through something that is like the third term. It must be known both that the middle belongs to the third and that the first belongs to what is like the third. For example, let A be bad, B undertaking war against neighbors, C stand for Athenians against Thebans, D stand for Thebans against Phocians. So then if we want to prove that warring with the Thebans is bad, it should be assumed that warring against one's neighbors is bad. (Conviction about this comes from similar cases, for example, that the war against the Phocians was bad for the Thebans.) Then, since [war] against one's neighbors is bad, and against the Thebans is against neighbors, it is evident that warring against the Thebans is bad. That B belongs to C and to D, then, is evident (for both are undertaking war against one's neighbors), as also is the premise that A belongs to D (for the war against the Phocians did not go to the advantage of the Thebans). But that A belongs to B will be proved through D. It would be the same way if proof of the middle about the extreme should come about through several terms.

It is evident, then, that a paradigm is neither as part to whole nor as whole to part, but rather as part to part, when both are below the same thing but one of them is known. It differs from induction because induction proves the extreme to belong to the middle from all the particulars and does not connect the deduction to the extreme, while a paradigm both does connect it and does not prove from them all.

2.25
Abduction

It is abduction when it is clear that the first term belongs to the middle but unclear that the middle belongs to the third, though nonetheless equally as convincing as the conclusion, or more so. Or also if there are few middles between the last term and the middle. For in all these ways it results that we are closer to scientific knowledge. For example, let A be teachable, B stand for scientific knowledge, and C justice.

Then it is evident that scientific knowledge is teachable but unclear whether virtue is scientific knowledge. Therefore, if BC is equally convincing as AC, or more so, it is abduction; for it is closer to knowing scientifically because of supposing something in addition that we previously did not have: the scientific knowledge of AC[119]). Or next, it is abduction if the middle terms between B and C are few; for in this way as well it is closer to knowing. For example, if D is squaring, E stands for rectilinear figure, F stands for circle. If there is only one middle term of E and F—that is, for a rectilinear figure together with lunes to become equal to a circle[120]—it would be closer to knowing. But when BC is not more convincing than AC and the middles are not few either, I do not call it abduction. Nor when BC is immediate: for that is scientific knowledge.

2.26
Objections

An objection is a premise contrary to a premise. It differs from a premise in that an objection can be particular while a premise either cannot be so at all or cannot be so in universal deductions. An objection is brought in two ways and through two figures: in two ways, because every objection is either universal or particular, and from two figures, because they are brought as premises opposite to a premise, and opposites are concluded only in the first and third figures. For when someone claims that it belongs to every, we object either that it belongs to none or that it does not belong to some; of these, "to none" is from the first figure and "not to some" from the last. **69^b1**

For example, let A stand for there being one scientific knowledge and B stand for contraries. When someone proposes that there is a single scientific knowledge of contraries, it is objected either that in general there is not the same scientific knowledge of opposites and contraries are opposites (so that the first figure comes about), or it is objected that there is not a single scientific knowledge of the known and the unknown (and this is the third figure: for of C, known and unknown, "being contraries" is true but "there being a single scientific knowledge of them" is false). Next, it is the same way with a privative premise. For if someone claims that there is not a single scientific knowledge of contraries, we say that there is the same scientific knowledge either of all opposites, or of some contraries (for example, of healthy and ill): "of every," then, is from the first figure, and "of some" from the third.

For unconditionally, when objecting universally one must state a contradiction about that one of the terms proposed that was universal (for example, one must object to the claim that there is not a single scientific knowledge of contraries by saying that there is a single scientific knowledge of all opposites). In this way, it must

119. Reading AΓ.
120. *SE* 171^b14–16, 172^a2–3.

be the first figure; for the term that was universal in relation to the initial subject term becomes the middle term. However, when objecting with a particular statement, one must state a contradiction about something that the premise was universal about—for example, that there is not the same scientific knowledge of the known and the unknown (for "contraries" is universal in relation to these). And it becomes the third figure; for the middle term—that is, "known and unknown"—is what is supposed in part.

Those premises from which it is possible to deduce a contrary result are also those from which we try to state objections. This is why we bring objections only from these figures, for only in them are there opposite deductions (for through the middle figure, it was not possible to deduce affirmatively). In addition, an objection through the middle figure could require more argument—for example, if someone did not grant that A belongs to B because C does not follow it (and this would be clear through other premises). But an objection must not wander off into other matters; rather, the other premise must be evident at once. This is also why it is only from this figure that a sign is not possible.[121]

Other objections also need to be examined, such as those from the contrary, those from what is similar, and those according to belief, and also whether it is possible to get a particular objection from the first figure or a privative objection from the middle figure.

2.27
Likelihoods and Signs

A likelihood and a sign are not the same thing.[122] Instead, a likelihood is an acceptable premise (for what people know happens or does not happen for the most part, or is or is not so for the most part, is a likelihood). For example, "people hate those they envy" or "people show affection for those they love." A sign, however, is intended to be a demonstrative (or necessary) premise or an acceptable one. For whatever is such that if it is, some certain thing is, or if it happened earlier or later the thing in question would have happened, that is a sign of this thing's happening or being. (An enthymeme is a deduction from likelihoods or signs.)

A sign is supposed in three ways, corresponding to the ways the middle term in the figures is supposed. That is, it is supposed either as in the first figure, or as in the middle, or as in the third. For example, proving that a woman is pregnant because she has milk is from the first figure, for the middle term is having milk (let A stand for being pregnant, B having milk, C for woman). "The wise are excellent, for Pittacus was excellent" is through the last figure. A stands for excellent, B stands for the wise,

121. Reading διὸ . . . ἔστιν.
122. Retaining the transmitted order of the text.

C stands for Pittacus. So it is true to predicate both A and B of C, except that people do not state the latter premise because they know it, though they do suppose the former. And "She is pregnant because she is pale" is meant to be through the middle figure: for since paleness follows pregnant women and also follows this woman, people think it has been proved that she is pregnant. A stands for pale, B stands for being pregnant, C stands for woman.

If only one premise is stated, then, it is only a sign, but if the other premise is supposed in addition, it is a deduction. For example, "Pittacus is generous, for the honor-lovers are generous, and Pittacus is an honor-lover." Or again, "The wise are good, for Pittacus was good but also wise." In this way, then, they become deductions. However, the one through the first figure is irrefutable if it is true (for it is universal), while the one through the last is refutable, even if the conclusion is true, because the deduction is neither universal nor in relation to the subject. For even if Pittacus is excellent, other wise men need not be so due to this. The deduction through the middle figure is always and in all ways refutable; for a deduction never comes about when the terms are related in this way. For it is not the case that if a pregnant woman is pale and this woman here is also pale, it is necessary that this woman is pregnant. The truth, then, may exist in all signs, but they have the differences we said.

So, either divide signs in this way and, among them, take the middle term as proof (for we say that what makes us know is proof, and the middle is most like this), or let those from the extreme terms be called "signs" and those from the middle term be called "proofs" (for what is most accepted and most true is what comes through the first figure). **$70^{b}1$**

It is possible to practice physiognomy if it is granted that those affections that arise naturally change the body and the soul at the same time. For perhaps someone who has learned music has changed his soul in a certain way. However, this affection is not one of those that are in us by nature, but instead is like such things as angers and appetites that are natural movements. If this is granted, and also that there is one sign of one thing, and if we are able to grasp the affection and the sign special to each kind of animal, we will be able to practice physiognomy. For if there is some special affection belonging to an indivisible kind, as courage does to lions, there will necessarily be some sign (for body and soul are assumed to be affected together with each other). Let this be having large extremities (which may also belong, though not universally, to other kinds of animals: for the sign is special in this sense, that it is an [affection] special to the kind as a whole, not special to one thing, as we usually use this term). This [affection] will also belong to another kind, and there will be a courageous human or some other animal that will then have the sign; for we assumed there was one sign of one affection. Consequently, if this is how matters stand, and if we are able to collect such signs from those animals which have only one special affection, and each of those has a sign (since it must have *one* sign), we will be able to practice physiognomy.

But if the whole kind has two special affections (as, for example, the lion is courageous and prone to sharing), how can we tell which one of the special signs that follow is the sign of which affection? Perhaps if both belong to something else but not as a whole, and among those cases in which each belongs to something but not entirely, some have one sign and not the other. For if something is courageous but not generous and possesses a certain one of the two signs, it is clear that this is also the sign of courage in the case of the lion.

Physiognomy is by means of a deduction in the first figure in which the middle converts with the first extreme but reaches beyond the third and does not convert with it. For example, courage is A, B stands for large extremities, C is lion. B belongs to everything C belongs to but also to other things. But A belongs to everything B belongs to and not to more things, but instead it converts (if it does not, there will not be one sign of one thing).

POSTERIOR ANALYTICS*

BOOK 1

1.1
Prerequisites for Scientific Knowledge

All teaching and all learning that involve thought come about from already existing knowledge. This is evident if we look at all cases; for the mathematical sciences are acquired in this way and so are each of the other crafts as well. The same holds too in the case of arguments, both those through deductions and those through induction; for it is through things antecedently known that they both do their teaching—the former getting hold of them as if from people who comprehend them, the latter proving the universal through the particular's being clear. Rhetorical arguments also persuade in the same ways; for they are either through paradigms, which is induction, or through enthymemes, which is precisely deduction.[1] **71ª1** 5 10

There are two ways in which it is necessary to have antecedent knowledge: for it is necessary in the case of some things to assume in advance that [each] is; in the case of some to comprehend what the thing being said is, and in the case of some to do both. For example, in the case of everything's being either affirmed or denied truly, that it is so; in the case of the triangle, that it signifies this; in the case of the unit, both—both what it signifies and that it is. For each of these is not clear to us in the same way. 15

It is possible to know when some things are antecedently known and some other things are known at the same time as we acquire our knowledge (for example, everything that falls under a universal of which we have knowledge). For one knew antecedently that every triangle has angles equal to two right angles; but that this [figure] in the semicircle is a triangle is something one came to know at the same time as one was doing the induction.[2] For in some cases learning comes about in this 20

* Translated by C. D. C. Reeve. Text: W. D. Ross, *Aristotelis Analytica Priora et Posteriora* (Oxford, 1964; corrected, 1968), in consultation with J. Barnes, *Aristotle Posterior Analytics* (Oxford, 1994).

1. *Rh.* 1356ª35–ᵇ11.

2. The induction leads from this particular figure T (the one in the circle), which one did not antecedently know, to the universal triangle, of which one antecedently knew that it had angles equal to two right angles, so that at the same time as one does the induction one comes to know that T has angles equal to two right angles (71ª26–27). No deduction is involved, since in this case one does not learn through a middle term (71ª21–24).

way, and it is not through the middle term that the last term comes to be known—this happens when the things are in fact particulars and not said of any underlying subject. But before having done the induction or having got hold of the deduction
25 one must perhaps be said to have scientific knowledge in one way, but in another way not to have it. For if one did not know unconditionally whether it is, how did one know unconditionally that it has angles equal to two right angles? Yet it is clear that one does have scientific knowledge in this way: one has scientific knowledge of it universally, but one does not have scientific knowledge of it unconditionally. Otherwise, the puzzle in the *Meno*[3] will result; for either one will learn nothing or else what one already knows.

30 For one must not speak in the way, at any rate, some people do who try to resolve it: "Do you know every pair to be even, or don't you?" And when one says yes, they put forward some pair of whose existence one was unaware, and so did not think to be even. For they resolve it by saying that people do not know every pair to be even, but rather [only] what they know to be a pair. And yet what they know is precisely
71b1 what they have a demonstration of and made their assumptions about; and they made their assumptions not about everything they know to be a triangle or to be even, but unconditionally about every number and every triangle; for no premise such as "that you know to be a number" or "that you know to be rectilinear" is assumed, but rather it is assumed to hold of every case.

5 But nothing (I think) prevents one from having in one way scientific knowledge of what one learns and in another way being ignorant of it; for what is absurd is not that one knows in some way what one is learning, but that one knows it in this way: in the respect and in the way in which one is learning it.

1.2
Unconditional Scientific Knowledge

We think we have scientific knowledge of a given thing unconditionally (and not—in
10 the sophistical way—coincidentally[4]), when we think we know of the cause due to which the thing is that it is its cause, and also that this does not admit of being otherwise. It is clear, therefore, that having scientific knowledge is something of this sort; for [it is clear in the case of] both those who do not have scientific knowledge and those who do have scientific knowledge: the former think that they are in this condition, while those who know scientifically are in it too. So what there is uncon-
15 ditional scientific knowledge of cannot be otherwise.

Whether there is another way of having scientific knowledge we will discuss later,[5] but we say that in fact we know through demonstration. And by a "demonstration"

3. Plato, *Meno* 80d–e.
4. *Met.* 1026b14–21.
5. 72b19–22.

I mean a scientific deduction; and by "scientific" I mean a deduction in virtue of which, by having it, we know scientifically. Therefore, if having scientific knowledge is the sort of thing we have posited it to be, it is also necessary for demonstrative scientific knowledge to proceed from things that are true, primary, immediate, and better known than, prior to, and causes of the conclusion; for in this way the starting-points will also be proper to what is proved. For while there can be a deduction even without these things, there will not be a demonstration; for it will not produce scientific knowledge.

They must be true, because it is not possible to have scientific knowledge of what is not—for example, that the diagonal [of a square] is commensurable [with its side].

They must proceed from things that are primary and indemonstrable because [otherwise] one will not know scientifically unless one has a demonstration of these things. For to have scientific knowledge of things of which there is a demonstration in a non-coincidental way is to possess the demonstration.

They must also be causes, better known, and prior—causes, because we know something scientifically only when we know the cause; prior, if indeed they are causes; and known antecedently not only in the other way, by being comprehended, but also by one's knowing that they are.

But things are prior and better known in two ways; for it is not the same thing to be prior by nature and prior in relation to us, nor to be better known and better known to us. I call "prior and better known to us" what is closer to perception, "prior and better known unconditionally" what is further away from it. What is most universal is furthest away, while particulars are closest; and these are opposed to each other.

To proceed from things that are primary is to proceed from proper starting-points; for I call the same thing "primary" and a "starting-point." A starting-point of demonstration is an immediate premise, and an immediate one is one to which no other is prior. A premise is one or other part of an assertion, one thing said of one thing. A dialectical premise is one that assumes either part indifferently, while a demonstrative premise is one that determinately posits one part, because it is true. An assertion is either part of a contradiction, while a contradiction is an opposition in which there is intrinsically no intermediate. The part of a contradiction that says something of something is an affirmation, the part that denies something of something is a denial.

An immediate deductive starting-point I call a "posit" if it cannot be proved, but is also not necessary for someone who is going to learn anything to grasp; one that it is necessary for someone to grasp who is going to learn anything at all, I call an "axiom"; for there are some things of this sort; for we are accustomed to use this name especially of such things. A posit that assumes either part of a contradiction (what I mean is that something is or that something is not) is a hypothesis; one without this is a definition. For a definition is a posit; for an arithmetician posits that a unit is what is indivisible in quantity; but it is not a hypothesis, for what a unit is and that it is are not the same.

But since [in order to have scientific knowledge] one must be persuaded of and know a thing by having the sort of deduction we call a "demonstration," and since there is such a deduction when the things from which the deduction comes about are the case, it is necessary for one not only to have antecedent knowledge of the primary things—either all of them or some of them—but also to know them more [than the conclusion]; for the cause due to which F belongs to a given thing always belongs more to it [than F does]—for example, the thing due to which we love something is more loved [than it]. So if indeed we know and are persuaded because of the primary things, we also know those more and are more persuaded of them, since it is because of them that we know and are persuaded of the posterior ones.

But it is not possible to be more persuaded of anything one neither knows nor is better disposed toward than one is of what one knows. But this is what will happen unless someone who is persuaded through demonstration has antecedent knowledge; for it is necessary to be more persuaded of the starting-points—either all of them or some of them—than of the conclusion.

Anyone who, on the other hand, is going to have scientific knowledge through demonstration must not only know the starting-points more and be more persuaded of them than of what is being proved, but also there must be nothing else more
72b1 persuasive or more known to him among the opposites of the starting-points from which there will be a deduction of the contrary error, if indeed anyone who has unconditional scientific knowledge must not admit of being persuaded out of it.

1.3
Regresses and Circles

To some people, because the primary things must be scientifically known, it seems that there is no scientific knowledge, while to others it seems that there is, and indeed that everything has a demonstration. Neither of these views is either true or necessary.

The former, who suppose that there is no scientific knowledge in any other way,[6] claim that we are led back without limit, on the supposition that we cannot have scientific knowledge of what is posterior on the basis of what is prior, if there are no primary things among them. And they are correct; for it is impossible to go through what is without limit. And if it comes to a stop and there are starting-points, these are unknowable since there is no demonstration of them—which alone, they say, is precisely what it is to have scientific knowledge. But if it is not possible to know the primary things, neither is it possible, unconditionally and fully, to have scientific knowledge of what proceeds from them, but only on the hypothesis that those things are the case.

6. I.e., than by demonstration. Reading ἄλλως.

The latter agree about having scientific knowledge; for they say it is only through demonstration, but that nothing prevents there being a demonstration of everything; for it is possible for a demonstration to be circular, that is, from each other.

We, on the other hand, say that not all scientific knowledge is demonstrative, but in the case of the immediates it is non-demonstrative (that this is necessarily so is evident; for if it is necessary to have scientific knowledge of the things that are prior and on which the demonstration depends, and for the immediates to come to a stop at some time, it is necessary for them to be non-demonstrative). This, then, is what we say about these things. And we also say that there is not only scientific knowledge but also some starting-point of scientific knowledge by which we come to know the definitions.

That it is impossible to demonstrate unconditionally in a circle is clear, if indeed a demonstration must proceed from things that are prior and better known; for it is impossible for the same things to be at the same time prior and posterior to the same things, unless they are so in different ways (for example, some prior in relation to us, others unconditionally)—this being precisely the way that induction makes things known. But in that case, unconditional knowing would not have been well defined, but would be twofold. Or else the other sort of demonstration would not be unconditional, since it proceeds on the basis of what is better known to us.

For those who say that there is circular demonstration, the result is not only what has just been stated, but also that they say nothing other than that this is the case if this is the case. But in this way it is easy to prove everything. It is clear that this results when three terms are posited. For it makes no difference whether we say it circles back through many terms or few, or through few or two. For when if A is the case, of necessity B is, and if B is then C is, then if A is the case C will be. If, then, if A is the case, of necessity B is, and if B is then A is (for this is what being circular is), let it be assumed that A is C. Hence to say that if B is the case A is the case is to say that [if B is the case] C is the case. But this is to say that if A is the case, C is the case. But C is the same as A. Hence it follows that those who say that there is demonstration in a circle are saying nothing other than that if A is the case then A is the case. But in this way it is easy to prove anything.

Nonetheless, this is not possible either, except in cases where things follow from each other in the way special affections do. If one thing is assumed, it has been proved that it is never necessary for anything else to be the case (I say "one thing" because neither if one term nor one posit is assumed, [is it necessary]): two posits are the first ones and fewest ones from which it is possible, if indeed it is possible to make deductions. If A follows from B and C, and these follow from each other and from A, in this case it is possible to prove all the postulates from each other in the first figure,

as is proved in the studies concerning deduction.[7] (It has also been proved that in the other figures either there is no deduction or else none about the assumptions.)

But in the case of things that are not counterpredicated it is in no way possible to prove them in a circle, and so since there are few things of this sort in demonstrations, it is evident that it is both empty and impossible to say that there is demonstration of things from each other, and that, because of this, it is possible for there to be demonstration of everything.

1.4
In Every Case, Intrinsically, and Universally

Since what there is unconditional scientific knowledge of cannot be otherwise, what is known scientifically in accord with demonstrative scientific knowledge will be necessary; and it is demonstrative if we have it by having a demonstration. Therefore, a demonstration is a deduction that proceeds from things that are necessary. Therefore, we must get hold of what things, that is, what sorts of things, demonstrations proceed from. But first let us define what we mean by "in every case," by "intrinsically," and by "universally."

I say that what is not such as to hold in some cases but not in others, or at some times but not at others, holds "in every case"—for example, if animal holds of every human, then if it is true to say that this is human, it is true to say that this is animal too, and if it is now true to say the one, it is now true to say the other as well; and if there is a point in every line, it is the same way. A sign of this is that it is how we in fact bring objections when asked whether something holds in every case, if it does not hold either in some case or at some time.

And whatever things belong in the what-it-is of something I say belong "intrinsically"—for example, line belongs intrinsically to triangle and point to line (for their substance is composed of these and these are present in the account that states what the thing is), and also, whatever ones belong to these things, which are present in the account that makes clear their what-it-is—for example, straight belongs to line and so does curved, and odd and even belong to number, and so do prime and composite, and equilateral and oblong;[8] and in all these cases line is present
73b1 in the account that states the what-it-is in the former ones, and number in the latter. Similarly, in other cases too I say that these sorts of things belong "intrinsically" to a given thing, while all that belong in neither way are coincidents—for example, musical and white are coincidents of animal.

7. *APr*. 2.5–7.

8. An equilateral number is n × n; an oblong number is n × m (where n ≠ m). About both sorts of numbers, as about straight and curved lines, things can be demonstrated.

Further, what is not said of some other thing as underlying subject—for example, what is walking is walking by being some other thing, and similarly for what is white,[9] while a substance, and anything that signifies a this something, is precisely what it is without being some other thing. Things, then, that are not said of an underlying subject I call "intrinsic," those that are said of an underlying subject, "coincidents."

Further, in another way, I say that what belongs to a given thing because of itself is "intrinsic," and what does not belong because of itself is a "coincident"—for example, if there was lightning while someone was walking, it was a coincident [of the walking]; for it was not because of the walking that there was lightning, but it was coincidental, we say. But if it was because of itself, it was intrinsic—for example, if something died while being sacrificed, and died during the sacrifice, we say it died because of being sacrificed, but not that it was coincidental that it died while being sacrificed.

Therefore, in the case of what there is unconditional scientific knowledge of, the things said to be intrinsic, in such a way as either to be present in the things of which they are predicated or what *they* are present in, hold because of themselves and are necessary. For it is not possible for them not to belong, either unconditionally or their opposites—for example, as straight and bent to line or odd and even to number. For a contrary is either a privation or a contradictory in the same kind, as, in the case of numbers, even is what is not odd, insofar as it follows. So if it is necessary either to affirm or deny, it is also necessary for what is intrinsic to belong.

Let "in every case" and "intrinsically" be defined in this way.

I say that whatever belongs in every case and intrinsically and insofar as it is itself belongs "universally." Therefore, it is evident that whatever is universal belongs of necessity to the things [it belongs to]. But "intrinsically" and "insofar as it is itself" are the same—for example, point and straight belong to a line intrinsically (for they in fact belong to it insofar as it is a line) and two right angles belong to a triangle insofar as it is a triangle (for a triangle in fact intrinsically has angles equal to two right angles). But something belongs universally whenever it is proved to belong to any random something that is primary. For example, having angles equal to two right angles is not universal to figures (and yet it is possible to prove of some figure that it has angles equal to two right angles, but not of any random figure, nor does one use any random figure in proving it; for a quadrilateral is a figure but does not have angles equal to two right angles), and though any random isosceles triangle does have angles equal to two right angles, it is not primary—on the contrary, triangle is prior. Therefore, if a random primary thing is proved to have angles equal to two right angles (or whatever), then it is to this primary thing that it belongs intrinsically and universally, and the demonstration is intrinsically of this case universally. To the other cases, it applies in a way but not intrinsically—even to the isosceles triangle it does not apply universally, but extends more widely.

9. Rejecting the addition of λευκόν.

1.5
Three Errors about Universal Demonstration

But it must not escape our notice that we often commit errors and that what is proved does not belong primarily and universally in the way that it seems to be proved universally and primarily. We make this mistake either when there is nothing higher to grasp beyond the particular or the particular cases,[10] or there is but it is nameless or applies to things that are different in form, or when what it is proved of is a whole taken as a part; for the demonstration will hold of the parts, and will do so in every case, but nonetheless the demonstration will not hold of this [whole] universally as the primary thing. But I say that a demonstration holds "of this primary thing, as such," whenever it holds of it universally insofar as it is the primary thing.

If, then, someone were to prove that things at right angles do not meet, the demonstration of this might seem to be because it applies to all things at right angles. But it does not, since this [conclusion results] not because the angles are equal in this way[, that is, by both being right angles,] but insofar as they are equal in any way at all. And if there were no triangles other than the isosceles, [having angles equal to two right angles] might seem to belong to an isosceles triangle insofar as it is isosceles.

And that proportionals alternate[11] might seem to apply to numbers insofar as they are numbers, lines insofar as they are lines, solids insofar as they are solids, and times insofar as they are times, as it once used to be demonstrated of these separately, although it is possible, indeed, to prove it of all cases by a single demonstration. But because all these things—numbers, lengths, times, solids—do not constitute a single named [kind] and differ in form from one another, they used to be taken separately. But now it is proved universally; for it did not belong insofar as they are lines, or insofar as they are numbers, but insofar as they are this [unnamed kind], which is assumed to belong universally.

Because of this, even if one proves of each triangle either by one demonstration or by a different one—a separate one for the equilateral and for the scalene and for the isosceles—that each has angles equal to two right angles, one does not yet know that the triangle has angles equal to two right angles, except in the sophistical way,[12] nor does one know it of triangle universally, not even if there is no other triangle beyond these. For one does not know it of a triangle insofar as it is a triangle, or even of every triangle (except numerically—one does not know it of every triangle in virtue of its form, even if there is no triangle that one does not know).

So when exactly does one not know universally, and when exactly does one know unconditionally? It is clear, indeed, that we would know [that a triangle has angles equal to two right angles] if being were the same for triangle and for equilateral

10. Reading ἢ τὰ καθ' ἕκαστα.
11. *NE* 1113ᵇ5–7.
12. 71ᵇ10.

triangle, either for each or for all [and we had proved that an equilateral triangle has angles equal to two right angles]. But if their being is not the same but different, and it belongs insofar as the triangle is a triangle, we do not know it. Does it belong insofar as it is a triangle or insofar as it is isosceles? And when does it belong to it as primary thing? And of what does the demonstration hold universally? It is clear that it would belong to a primary thing when other things have been abstracted. For example, having angles equal to two right angles will belong to an isosceles bronze triangle, but will also do so when being bronze and being isosceles have been abstracted. But not when figure and limit are.[13] But they are not the primary thing. Of what, then, [does it hold universally] as the primary thing? If it is "triangle," it is in virtue of this that it belongs to others, and it is of this that the demonstration holds universally.

1.6
Scientific Premises Are Intrinsic Ones

If, then, demonstrative scientific knowledge proceeds from necessary starting points (for what one knows scientifically cannot be otherwise) and the things that belong intrinsically to things are necessary (for some belong in the what-it-is; while others are predicated of things that themselves belong in their what-it-is, to which one or other of the opposites must belong), it is evident that it is from some things of this sort that demonstrative deduction will proceed; for everything belongs in this way or coincidentally, and coincidents are not necessary.

Either, then, it must be stated like this or else by positing as a starting-point that the demonstration is necessary,[14] that is, that if something has been demonstrated it cannot be otherwise—the deduction, therefore, must be from necessities. For from truths it is possible to deduce without demonstrating, but from necessities it is not possible to deduce otherwise than by demonstrating; for this is in fact a mark of demonstration.

A sign that demonstration proceeds from necessities is that this is how we bring objections against those who think they are demonstrating (that it is not necessary), if we think that—either in general or, at any rate, for the sake of the argument—it admits of being otherwise.

It is also clear from these considerations that those people are simpleminded who think that if a premise is acceptable and true they grasp the starting-points in the correct way—for example, the sophists who think that to know scientifically is to have scientific knowledge.[15] For a starting-point is not what is acceptable or not,[16]

13. Because a triangle is by definition a plane figure limited (or bounded) by three straight lines.
14. Reading ἀναγκαῖον.
15. Plato, *Euthydemus* 277b, *Theaetetus* 197a.
16. Reading ἔνδοξον ἢ μὴ ἀρχή.

but what is primary in the kind about which something is being proved; and not everything true is proper [to the kind].

That the deduction must proceed from necessities is clear from the following too. For if someone, in a case where there is a demonstration, does not have an account of the why, he is not a scientific knower, and if it might be that A belongs of necessity to C, but B, the middle term through which this was demonstrated, does not belong of necessity, then he does not know why [A belongs]. For it does not hold because of the middle; for the middle admits of not being [the case], while the conclusion is necessary.

Further, if someone does not know something now, even though he has an account of it and is preserved, and the thing is preserved, and he has not forgotten it, then he did not know it earlier either. But the middle term might pass away if it is not necessary. So he will have the account, since he is preserved and the thing is preserved, but he does not know it. Therefore, he did not know it earlier either. But if the middle term has not passed away, though it is possible for it to pass away, the result will be possible and admit of obtaining. But in such circumstances it is impossible to have knowledge.

75a1 When the conclusion holds of necessity, nothing prevents the middle term through which it was proved from being non-necessary. For it is possible to deduce a necessity from non-necessities, just as it is to deduce a truth from non-truths. But when the middle term holds of necessity, the conclusion holds of necessity too, just as from true premises the conclusion is always true (for let A be predicated of B of necessity, and B of C; therefore for A to belong to C is also necessary). But when the conclusion is not necessary, the middle term cannot be necessary either (for let A belong to C not of necessity, and let A belong to B and B to C of necessity; A will then belong to C of necessity too; but it was assumed not to).

Therefore, since if someone has demonstrative scientific knowledge of something, it must hold of necessity, it is clear that the demonstration he has must be through a middle term that is necessary too. Otherwise, he will not know scientifically either why or that it is necessary for that thing to hold, but either he will think he knows, though he does not (if he takes as necessary what is not necessary), or he will not even think that he does (equally whether he knows the that through middle terms or the why through immediates).

But there is no demonstrative scientific knowledge of coincidents that are not intrinsic (in the way in which intrinsic coincidents were defined). For we cannot prove the conclusion of necessity; for it is possible for what is coincidental not to belong (for that is the sort of coincident I am talking about). And yet one might perhaps raise a puzzle as to what the point is of asking for premises about these things, if the conclusion is not necessary. For it is no different than if someone asked random questions and then asserted the conclusion. But one must ask questions not on the supposition that the answers make the conclusion necessary, but because it is necessary for anyone who gives these answers to assert the conclusion, and to assert it truly, if the answers truly hold.

But since in each kind whatever belongs to each thing intrinsically, and insofar as it is that thing, belongs of necessity, it is evident that scientific demonstrations are concerned with things that belong intrinsically and proceed from such things. For coincidents are not necessary, and so it is not necessary to know why a conclusion derived from them holds, not even if it does always but not intrinsically—for example, in deductions through signs. For something might belong intrinsically but one will not scientifically know that it does, or why it does. (To have scientific knowledge of the why is to have scientific knowledge through the cause). Therefore, it is because of itself that the middle term must belong to the third term, and the first to the middle.

1.7
Demonstration Stays within a Single Kind

Therefore, it is not possible to prove anything by crossing over from one kind [to another]—for example, proving something geometrical by arithmetic. For there are three things in demonstrations: one, what is being demonstrated—the conclusion (this is what belongs intrinsically to some kind); another, the axioms (axioms are the things from which the demonstration proceeds); third, the underlying kind whose affections and intrinsic coincidents the demonstration makes clear. **$75^{b}1$**

The things from which the demonstration proceeds may be the same, but in cases where the kinds are different, as with arithmetic and geometry, it is not possible to apply an arithmetical demonstration to the coincidents of magnitudes, unless the magnitudes are numbers. (How this is possible in certain cases will be stated later.[17]) On the contrary, an arithmetical demonstration always contains the kind with which the demonstration is concerned, and the other demonstrations likewise. So if a demonstration is to cross over, it is necessary for the kind to be the same either unconditionally or in some respect. Clearly, it is impossible otherwise; for the extreme and middle terms must be from the same kind; for if they are not intrinsic, they will be coincidents.

That is why it is not possible to prove by geometry that there is one science of contraries, nor that two cubes make a cube; nor is it possible to prove by one science what belongs to a different one, except when they are so related to one another that one falls under the other—as, for example, optics is to geometry and harmonics to arithmetic. Nor is it even possible to prove by geometry anything that belongs to lines but not insofar as they are lines or insofar as they proceed from the starting-points special to geometry—for example, whether the straight line is the most beautiful or whether it is contrary to the curved one. For these things belong to them not as their special kind, but as something common.

17. $76^{a}9$–15, 23–25, $78^{b}34$–$79^{a}16$.

1.8
Demonstration Is of Eternal Things

It is evident too that if the premises from which a deduction proceeds are universal, then it is also necessary for the conclusion of such a demonstration—that is to say, an unconditional demonstration—to be eternal. Therefore, there is no demonstration of what is capable of passing away and no unconditional scientific knowledge of it either, though there is a sort that is coincidental, because it does not hold of it universally,[18] but at some time and in some way.

But when there is such a demonstration, one premise or the other must be non-universal and capable of passing away: capable of passing away, because when it is the case the conclusion will also be the case; non-universal, because it will apply in certain respects, but in others it will not.[19] So that it is not possible to deduce that anything holds universally, but only that it holds now.

It is the same way too as regards definitions, since in fact a definition is either a starting-point of demonstration, a demonstration differing in arrangement, or a sort of conclusion of a demonstration.[20]

Demonstrations and sciences concerned with things that come about often—for example, eclipses of the moon—clearly hold always, insofar as they apply to this sort of thing, but they are particular insofar as they do not always hold [of these things]. And as with eclipses, so in the other cases.

1.9
Special and Indemonstrable Starting-Points

Since it is evident that it is not possible to demonstrate a given thing except from its own starting-points, if what is being proved belongs to it insofar as it is that thing, it is not possible to have scientific knowledge of this [simply] from having proved it from premises that are true, indemonstrable, and immediate. Otherwise, it will be possible to prove things in the way Bryson proved the squaring of the circle. For such arguments prove things in virtue of some common feature that belongs to something else as well. That is why the arguments also apply to other things that are not in the same kind. Hence one does not have scientific knowledge of that thing insofar as it is that thing, but coincidentally; for otherwise, the demonstration would not apply to another kind as well.

We scientifically know a given thing non-coincidentally when we know it in virtue of that in virtue of which it belongs, from the starting-points of that thing insofar as

18. Reading καθόλου.
19. Reading ᾧ μὲν ἔσται ᾧ δ’ οὐκ ἔσται ἐφ’ ὧν.
20. 2.10.

it is that thing—for example, knowing that [a triangle] has angles equal to two right angles when we know that it belongs intrinsically to [the triangle, and derive this] from its starting-points. So if this also belongs intrinsically to what it belongs to, it is necessary for the middle term to be in the same kind.

Otherwise, it will be like harmonics [being proved] through arithmetic. Such things are proved in this way, but there is a difference. Such things are proved in this way, but there is a difference. For the *that* is the concern of one of the two sciences (for the underlying kind is different), while the *why* is the concern of the higher one, to which the affections belong intrinsically. So from these considerations too it is evident that it is not possible to demonstrate a given thing unconditionally except from its own starting-points. But the starting-points of these have a common feature.

But if this is evident, it is also evident that it is not possible to demonstrate the starting-points special to a given thing [from other ones]; for then those starting-points will be starting-points of all things, and the science of them will have control over all things. For in fact the one who knows from the higher causes knows more scientifically; for one knows from prior causes when one knows from uncaused causes. So if he knows more fully, in fact, most fully, then that science will also be more fully, in fact, most fully, a science. But a demonstration does not apply to another kind, except, as was said,[21] in the way that geometrical demonstrations apply in the case of mechanics or optics and as arithmetical ones do in the case of harmonics.

It is difficult to know whether one knows or not. For it is difficult to know whether or not we know from the starting-points of a given thing. (For that is precisely what knowing is.) But we think that we have scientific knowledge of something if we have a deduction of it from things that are true and primary. But this is not so; instead, it must be in the same kind as the primary things.

1.10
The Starting-Points in a Kind

I call "starting-points" in a given kind those things for which it is not possible to prove that they hold. What both the primary things and the things that proceed from them signify is assumed; but that they hold, it is necessary to assume for the starting-points and to prove for the rest—for example, it is necessary to assume what a unit is or what straight and triangle are, and also that a unit and magnitude are, but to prove the other things.

Among the things used in the demonstrative sciences, some are special to each science while others are common, but common by analogy, since something is useful, in fact, [only] to the extent that it applies to the kind that falls under the science: special

21. 75^b14–17, 76^a9–15.

ones—for example, that a line is such-and-such, and straight is such-and-such; common ones—for example, that if equals are subtracted from equals, the remainders are equal. Each of these is sufficient to the extent that it applies to the kind; for it will produce the same result even if one assumes it to hold not of everything but only of
76b1 magnitudes, or, in the case of the arithmetician, of numbers.

Also special are the things that are assumed to be, and concerning which the science gets a theoretical grasp on what belongs to them intrinsically—for example, as regards units, arithmetic, and as regards points and lines, geometry. For they assume that these things are and that they are this. As for the intrinsic affections of these, they assume what each signifies—for example, arithmetic assumes what odd, even, square, or cube signifies, while geometry assumes what incommensurable, broken line, or oblique line signifies; but that these things are, they prove through the common things and from what has been demonstrated. And astronomy does the same thing.

For every demonstrative science is concerned with three things: what it posits to be (these constitute the kind on whose intrinsic affections it gets a theoretical grasp); the common so-called axioms (that is, the primary things from which the demonstrations proceed); and third, the affections, concerning which it assumes what each signifies. But certainly nothing prevents some sciences from disregarding some of these—for example, not hypothesizing that the kind is, if it is evident that it is (for that number is, and that hot and cold are, is not clear in the same way), nor need they assume what the affections signify, insofar as these are clear. In the same way, in the case of the common things, they need not assume what subtracting equals from equals signifies, because it is known. Nonetheless, by nature, at any rate, there are these three things: that concerning which the science proves things, the things it proves, and the things from which it proves them.

What must be the case because of itself, and one must believe to be the case, is neither a hypothesis nor a postulate. For demonstration is not directed toward external argument, but toward the one in the soul, since deduction is also not [so directed]. For it is always possible to object to external argument, but not always to internal argument. But whenever one assumes something provable without having proved it oneself, if the learner believes this assumption to be so, one is hypothesizing it (and it is a hypothesis not unconditionally but only in relation to the learner). But if one assumes the same thing when the learner has either no belief or even the contrary belief, he makes a postulate. And it is in this that a hypothesis and a postulate differ; for a postulate is contrary to the learner's belief, or is something which, though demonstrable, one assumes and uses without demonstrating.

Terms are not hypotheses (for they are not said to be or not to be anything), while hypotheses are among the premises, while terms need only be comprehended. But this is not hypothesizing (unless one is going to say that even hearing is hypothesizing). On the contrary, hypotheses are among the things which, if they are the case, then the conclusion comes about due to their being the case.

Nor does the geometer hypothesize falsehoods, as some people have claimed,[22] saying that one must not make use of falsehoods, and that the geometer speaks falsely when he says of a line that is not a foot long that it is a foot long or that a drawn line is straight when it is not straight. But the geometer does not conclude anything from the line's being as he himself has described it, but from the things that are proved by means of these figures.

Further, all postulates and hypotheses are either universal or particular, and terms are neither of these.

1.11
Platonic Forms; Common Things

There is no necessity for there to be Forms, or one thing beyond the many, if there is to be demonstration. It is necessary, however, for it to be true to say that one thing holds of many; for if this is not the case, there will be no universal. And if there is no universal, there will be no middle term, so that there will be no demonstration either. Therefore, there must be one and the same thing, and not a homonymous one, that holds of many things.

No demonstration assumes that it is not possible to affirm and deny at the same time—unless the conclusion too must be proved in this way. On the contrary, it is proved by assuming that it is true to affirm the first term of the middle, and that it is not true to deny it. As for the middle term, it makes no difference if one assumes that it is and that it is not, and likewise for the third term. For if one is given something of which it is true to say that it is human, if it is also true to say that it is not-human, then provided only that it is true to say that a human is an animal and not a not-animal, it will be true to say that Callias, even if he is also not-Callias, is nonetheless an animal and not a not-animal. The cause of this is that the first term is said not only of the middle term, but also of something else, because it holds of many; so that even if the middle term both is itself and is not itself,[23] it makes no difference to the conclusion.

Demonstration by reducing to the impossible, for its part, assumes that all things are affirmed or denied, and these not always universally, but to the extent that is sufficient—and it is sufficient when it applies to the kind. (By "applies to the kind" I mean the kind on which one brings the demonstrations to bear, as was also stated previously.[24])

All the sciences share with one another the common things (by "common things" I mean the ones people use as the things from which demonstration proceeds, but not what they prove things about nor what they prove), and dialectic shares these with

22. E.g., Protagoras (*Met.* $997^{b}35$–$998^{a}4$).
23. I.e., so that the middle term is both F and not F.
24. $76^{a}42$–$^{b}2$.

all of them, as would anything that tried to prove the common things in a universal way—for example, that everything is affirmed or denied, or that equals subtracted from equals leave equals, or other things of this sort. But dialectic is not concerned in this way with any determinate sorts of things, or with any one single kind. For if it were, it would not ask questions; for when one is demonstrating it is not possible to ask questions because, when opposites are given, one cannot prove the same thing. This was proved in the studies concerning deduction.[25]

1.12
The Role of Questioning in Science

If a deductive question is the same thing as a premise that is one part of a contradiction, and in each science there are premises from which a deduction proceeds in each one, then there will be such a thing as a scientific question—one from which a deduction proper to each science proceeds. Therefore, it is clear that not every question will be geometrical (or medical, and similarly in the other cases), but only those from which something with which geometry is concerned can be proved, or which can be proved from the same things as in geometry, as with optics. And similarly in the case of the others. And as regards these, an argument must be given from the starting-points and conclusions of geometry, while to have to give an argument concerning the starting-points is not a task for a geometer insofar as he is a geometer. And similarly in the case of the other sciences. Therefore, one must not ask each scientist every question, nor must he have to answer every question he is asked about each thing, but only those determined by his science. If one discusses in this way with a geometer insofar as he is a geometer, it is evident that one does so correctly if one proves something from these. Otherwise, one will do so incorrectly. And it is clear that one does not refute a geometer either, except coincidentally. So one must not discuss geometry among those ignorant of geometry; for one who discusses defectively will escape detection. And the situation is the same in the case of the other sciences too.

But since there are geometrical questions, are there also non-geometrical questions? And for each science, with respect to what sort of ignorance are there [the equivalents of] geometrical questions? And is a deduction in accord with ignorance one that proceeds from opposite ones [to geometry], or is it one that is fallacious, though in accord with geometry, or is it one proceeding from another craft? For example, is a musical question about geometry non-geometrical, while thinking that parallel lines meet is geometrical in one way and non-geometrical in another? For being non-geometrical is twofold, like being non-rhythmical, and in one way being non-geometrical is not possessing the science, and in another possessing it

25. *APr.* 57a36–b17.

defectively. And it is this ignorance—the one that proceeds from the relevant sorts of starting-points—that is contrary [to the science]. But in mathematics, the fallacious argument is not possible in the same way, because the middle term is always twofold; for something is said of all of it, and, again, it is said of all of something else (but all is not said of what is predicated).[26]

But while it is possible to see, as it were, these things by the understanding, in [external] arguments, they escape notice.[27] Is every *kuklos* a figure? (If one draws one, [the question] is clear.) Then, are epic poems a *kuklos*? (It is evident that they are not.)[28]

One must not bring an objection to an argument if the premise is inductive. For just as there is no premise that does not apply to several things (for otherwise it will not apply to all, and a deduction proceeds from universal premises), it is clear that there is no objection either. For premises and objections are the same; for what one brings as an objection may become a premise, either demonstrative or dialectical.

But it happens that some people argue non-deductively because they assume things that follow both terms—for example, Caeneus in fact does so when he says that fire consists in multiple proportion;[29] for fire is in fact generated quickly, he says, and so is this proportion. But in this way there is no deduction; though there is one if multiple proportion follows fastest proportion and the fastest proportion in a movement follows fire.

Sometimes, then, it is not possible to produce a deduction from what has been assumed, and sometimes it is, but it is not seen.

If it were impossible to prove truth from falsehood, to do analytics would be easy; for then there would of necessity be conversion. For let A be something that is the case; and if A is the case, then these things, which I know to be the case, are the case (call them B). Therefore, from these I will prove that A is the case. Conversion is more common in mathematics because mathematics assumes nothing coincidental—and in this respect too it differs from dialectics—but [only] definitions.

A deduction increases not through the middle terms but by adding—for example, A is said of B, B of C, and C, again, of D, and so on without limit. Also laterally—for example, A is said both of C and E. For example, A is limited (or even unlimited) number, B limited odd number, and C odd number: therefore, A is said of C. D is limited even number, E even number: therefore, A is said of E.

26. B belongs to every A, C belongs to every B, but though C therefore belongs to every A, every C is not said to belong to every A.
27. $76^b25–27$.
28. A *kuklos* can be either a circle or a cycle. The epic poems are the latter, but not the former.
29. I.e., geometrical proportion.

1.13
The That and the Why

Having scientific knowledge of the that and of the why are different.

First, they are different within the same science and in two ways. In one way, if the deduction does not proceed through immediates (for the primary cause is not grasped, but the scientific knowledge of the why comes about in virtue of the primary cause). In a second way, if it does proceed through immediates, but not through the cause, but rather through the more known of the converting terms. For, among counterpredicated terms, nothing prevents the term that is not the cause from sometimes being more known, so that demonstration will proceed through it.

For example, a demonstration that the planets are near due to their not twinkling. Let C be planets, B not twinkling, and A being near. It is true to say B of C, for the planets do not twinkle. But also to say A of B, for what does not twinkle is near (let this be assumed through induction or through perception). It is necessary, then, for A to belong to C, so that it has been demonstrated that the planets are near. This deduction, then, is not of the why but of the that; for it is not because they do not twinkle that they are near, but because they are near that they do not twinkle.

It is also possible for the latter to be proved through the former, and then the demonstration will be of the why. For example, let C be planets, B being near, and **78b1** A not twinkling. Then B again belongs to C and A to B, so that A also belongs to C. And the deduction is of the why. For the primary cause has been grasped.

Again, [take] the way people prove that the moon is spherical through its waxing—for if what waxes in this way is spherical, and the moon waxes [in this way], it is evident that it is spherical. In this way, then, one has produced a deduction of the that, while if the placement of the middle term is reversed, of the why.[30] For it is not because of its waxings that the moon is spherical, but rather it has waxings of this sort because it is spherical. Let the moon be C, spherical B, and waxing A.

But in cases where the middle terms do not convert and the one that is not the cause is more known, the that is proved but not the why.

Further, there are cases where the middle is placed outside. For in these too the demonstration is of the that and not of the why. For the cause is not stated. For example, why does a wall not breathe? Because it is not an animal. For if this were the cause of not breathing, then being an animal would have to be the cause of breathing—that is, if the negation is the cause of something's not belonging, the affirmation is the cause of its belonging (as in this case: if the cause of not being healthy is the hot and cold elements not being proportional, their being proportional is the cause of being healthy); similarly, if the affirmation is the cause of something's belonging, the negation is the cause of its not belonging. But in the case exhibited, what was stated does not occur; for not every animal breathes. A deduction of this sort of cause comes

30. I.e., if instead of B holds of A, one has A holds of B.

about in the middle figure. For example, let A be animal, B breathing, and C wall. A belongs to every B (for all animals breathe), and to no C, so that B too belongs to no C. Therefore, a wall does not breathe.

These sorts of causes seem like statements that go too far (that is, when one states the middle term at too great a remove)—for example, like Anacharsis' statement that among the Scythians there are no pipe-playing girls, for there are no vines either.

With regard to the same science, then, and with regard to the position of the middle terms, these are the differences between a deduction of the that and one of the why.

The why and the that differ, however, in another way by each of them being theoretically grasped by a different science. These are the cases that are related to each other in such a way that one falls under the other—for example, as optics is related to geometry, mechanics to solid geometry, harmonics to arithmetic, and stargazing to astronomy. Some of these sciences have pretty much the same name—for example, mathematical and nautical astronomy, and mathematical harmonics and acoustical harmonics. For in these cases it is for the perceptual scientists to know the that, and for the mathematical ones to know the why; for the latter possess the demonstrations of the causes, and often they do not know the that, just as people who get a theoretical grasp on the universal often do not know some of the particulars through lack of observation. These are things that, though they are something else in their substance, furnish forms. For mathematics is concerned with forms; for they are not said of any underlying subject; for even if the geometrically treatable ones[31] are said of an underlying subject, still it is not insofar as they are said of an underlying subject that they are such.

There is another science—that concerned with the rainbow—that is related to optics as optics is to geometry. For here it is for a natural scientist to know the that, and for a student of optics—either unconditional or mathematical—to know the why. And in fact many sciences that are not subordinate to each other are related in this way—for example, medicine to geometry; for that circular wounds heal more quickly is for the doctor to know, but it is for the geometer to know why.

1.14
The Superiority of the First Figure

Among the [syllogistic] figures, the first is most scientific. For the mathematical sciences carry out their demonstrations through this figure—for example, arithmetic, geometry, and optics—and so do pretty much all those that investigate the why. For a deduction of the why is carried out through this figure, whether it is in general[32]

31. Reading γεωμετρητά.
32. I.e., in all cases.

or for the most part and in most cases. That is also why it is the most scientific; for getting a theoretical grasp on the why is most in control of knowledge.

Next, only through this figure is it possible to hunt down scientific knowledge of the what-it-is. For in the middle figure there are no positive deductions, but scientific knowledge of the what-it-is is scientific knowledge of an affirmation; and in the last figure, although affirmative deductions do occur, they are not universal, while the what-it-is is of universals; for it is not [merely] in some place that a human being is a two-footed animal.

Further, this figure has no need of the others; but they are filled up and increased through it, until they arrive at the immediates.

It is evident, then, that the first figure is most in control of scientific knowledge.

1.15
Negative Propositions

Just as it is possible for A to belong to B indivisibly, so it is also possible for it to not belong indivisibly. By belonging or not belonging "indivisibly" I mean that there is no middle term for them; for then the belonging or not belonging will not hold in virtue of something else.

When, then, either A or B is included in some whole, or when both are, it is not possible for A to not belong to B in the primary way.[33] For let A be in the whole C. Then if B is not in the whole C (for it is possible for A to be included in some whole and for B not to be included in it), there will be a deduction of A's not belonging to B.
79b1 For if C belongs to every A and to no B, A belongs to no B. Similarly, if B is included in some whole—for example, in D. For D belongs to every B and A to no D, so that A will, by deduction, belong to no B. It will be proved in the same way if both terms are included in some whole.

But that it is possible for B not to be included in some whole that A is included in, or, again, for A not to be included in one that B is included in, is evident from columns of terms that do not overlap each other. For if nothing in the column ACD is predicated of anything in the column BEF, but A is included in the whole H, which is in the same column, it is evident that B will not be in H; for then the columns will overlap. Similarly, if B is included in some whole.

But if neither is included in a whole and A does not belong to B, it is necessary for A to indivisibly not belong. For if there will be a middle term, it is necessary for one or the other of them to be included in some whole. For the deduction will be either in the first figure or in the middle one. If, then, it is in the first figure, B will be included in some whole (for the premise in relation to this term [as subject] must be affirmative), while if it is in the middle figure, one or the other of them will be in

33. I.e., indivisibly or immediately.

some whole; for a deduction comes about when the privative is assumed in relation to either of the two. But if both are negative, there will not be a deduction.

It is evident, then, that it is possible for one thing to indivisibly not belong to another, and we have said when and how it is possible.

1.16
Ignorance and Error in Immediate Cases

Ignorance, not of the sort that is so-called with respect to a negation, but with respect to a disposition, is error that comes about in a deduction. And in the cases of things that belong or do not belong in the primary way, this comes about in two ways: either when one simply accepts that it belongs or does not belong or when one accepts the supposition through a deduction. Error in a simple supposition is simple, but in supposition through a deduction it is of several sorts.

For let A belong to no B indivisibly. Then if one deduces that A belongs to B by taking C as a middle term, one will have erred through a deduction. And it is possible for both premises to be false, but it is possible for only one of them to be false. For if neither A belongs to any C nor C to any B, but the reverse of each has been assumed, both will be false. But it is possible for C to be related to A and B in such a way that it neither falls under A nor belongs universally to B. For it is impossible for B to be included in any whole (for A was said to not belong to it in the primary way), and it is not necessary for A to belong universally to everything there is. So both premises will be false.

But it is also possible to take one of the premises as true—not, however, either one at random, but rather AC. For premise CB will always be false, because B is not **80^a1** included in anything, while AC may be true—for example, if A belongs indivisibly to both C and B (for when the same thing is predicated in the primary way of several things, neither will be included in the other). But it makes no difference if it belongs non-indivisibly.

Error about something belonging comes about in these ways and only in these (for there is not, as we saw,[34] a deduction of belonging in any other figure), but error about something not belonging comes about both in the first and in the middle figure.

First let us say in how many ways it comes about in the first figure and how the premises hold. Error is possible when both are false—for example, if A belongs indivisibly both to C and to B. For if A is assumed to belong to no C and C to every B, the premises are false. But it is also possible when one—either one—is false. For it is possible for AC to be true and CB false—AC true because A does not belong to everything there is, CB false because it is impossible for C to belong to B when A belongs to no C (for then the premise AC will no longer be true; at the same time, if

34. *APr*. 1.5–6.

both are true, the conclusion will be true too). But it is also possible for premise CB to be true while the other is false—for example, if B is included both in C and in A; for then it is necessary for one of the two to fall under the other, so that if one assumes that A belongs to no C the premise will be false.

It is evident, then, that the deduction will be false both when one premise is false and when both are false.

In the middle figure it is not possible for both premises to be false as wholes. For when A belongs to every B, it will not be possible to get hold of a term that will belong to all of the one and none of the other. But one must assume premises in such a way that this term belongs to one and does not belong to the other, if indeed there is to be a deduction. If, then, they are false when assumed in this way, it is clear that when they are assumed in the contrary way, they will hold in the reverse one. But this is impossible.

But nothing prevents each of them from being false in part—for example, C might belong both to some A and to some B; for if it is assumed to belong to every A and to no B, both premises will be false—not, however, as wholes but in part. And if the privative is posited in the reverse way, the same holds.

And it is possible for one—in fact, either one—to be false. For what belongs to every A also belongs to [every] B. If, then, C is assumed to belong to the whole of A and to not belong to the whole of B, CA will be true but CB false. Again, what belongs to no B will not belong to every A either; for if it belongs to A, then to B too. But it was assumed not to belong to B. If, then, C is assumed to belong to the whole of A and to no B, the premise CB is true and the other one false.

Similarly, if the privative is transposed. For what belongs to no A will not belong to any B either. If, then, C is assumed not to belong to the whole of A and to belong to the whole of B, the premise CA will be true and the other one false. And, again, to assume that what belongs to every B belongs to no A is false. For if it belongs to every B, it is necessary for it also to belong to some A. If, then, C is assumed to belong to every B and to no A, CB will be true and CA false.

It is evident, then, that there will be a deduction leading to error in the case of indivisible premises when both are false and also when only one of them is.

1.17
Error in Non-immediate Cases

In the case of things that belong non-indivisibly, when the deduction of the falsehood comes about through the proper middle term, it is not possible for both premises to be false, but only the one in relation to the major extreme. (I call "a proper middle term" one through which the deduction of the contradictory[35] comes about.) For

35. I.e., of the false conclusion.

let A belong to B through a middle term C. Since, then, CB must be assumed as affirmative if a deduction is to come about, it is clear that this will always be true; for it does not convert. But premise AC is false; for it is when this is converted that the contrary deduction comes about.

Similarly, if the middle term is taken from another column—for example, D, if it is both included in the whole of A and predicated of every B; for it is necessary for the premise DB to stand and for the other to be converted, so that the former is always true and the latter always false. And this sort of error is pretty much the same as that through a proper middle term.

But if it is not through the proper middle term that the deduction comes about, when the middle falls under A and belongs to no B, it is necessary for both premises to be false. For the premises must be assumed in a way contrary to the way they actually hold, if there is going to be a deduction; but assumed in this way, both come out false. That is, if A belongs to the whole of D and D to no B; for when they are converted there will be a deduction and both premises will be false.

But when the middle term—for example, D—does not fall under A, AD will be true and DB false. For AD is true because D was not included in A, while DB is false because, if it were true, the conclusion would be true; but it was [assumed to be] false.

When error comes about through the middle figure, it is not possible for both premises to be false as wholes (for when B falls under A, it is not possible for any term to belong to all of one and none of the other, as was also said earlier[36]), but it is possible for one—in fact, either one—[to be false as a whole]. For if C belongs to both A and B, then if it is assumed to belong to A but not to B, CA will be true and the other premise false. Again, if C is assumed to belong to B and to no A, CB will be true and the other premise false.

If the deduction of the error is privative, we have said[37] when and through what sorts of things there will be error. But if it is affirmative, when it is through the proper middle term, it is impossible for both premises to be false; for it is necessary for premise CB to stand, if indeed there is to be a deduction, as was also said previously.[38] So AC will always be false; for this is the one that converts.

It is the same way if the middle term is taken from another column, as was also said[39] in the case of privative error; for it is necessary for DB to stand and for AD to convert, and the error is the same as before.

But when the deduction is not through the proper middle term, if D falls under A, this premise will be true and the other one false; for it is possible for A to belong to several things that do not fall under each other. But if D does not fall under A, it is clear that this premise[40] will always be false (for it was assumed as affirmative), while premise

36. 80^a27–33.
37. 80^b18–32.
38. 80^b23.
39. 80^b26.
40. I.e., AD.

DB admits of being true and also of being false. For nothing prevents A from belonging to no D and D to every B—for example, animal to [no] scientific knowledge, scientific knowledge to [every] music. Nor does anything prevent A from belonging to no D and D to no B. It is evident, then, that if the middle term does not fall under A, it is possible for both premises to be false, or for one—the first—to be false.[41]

It is evident, then, in how many ways and due to what things it is possible for errors to occur in deduction, both in the case of immediate premises and in the case of conclusions proved through deduction.

1.18
Perceptual Ignorance

It is also evident that if some perception is wanting, some scientific knowledge is also wanting, and this knowledge is impossible to obtain, since we learn either by induction or by demonstration; demonstration is from universals and induction is from particulars, and it is impossible to get a theoretical grasp on universals except through induction (since even the things we speak of as a result of abstraction will be made known [only] through induction, that some belong to each kind, even if they are not separable insofar as each is such as it is). But to make an induction without having perception is impossible; for perception is of particulars, and it is not possible for scientific knowledge to grasp these; for it cannot do so either from universals without induction or through induction without perception.

1.19
The Number of Premises and the Sorts of Predication

Every deduction proceeds through three terms. One sort is able to prove that A belongs to C because it belongs to B and B belongs to C, and the other sort is privative, having as one premise that something belongs to something else, and the other that something does not belong. It is evident, then, that these are the starting-points—that is, the ones that are called "hypotheses"; for it is necessary to assume these in this way in order to prove things—for example, that A belongs to C through B, and, again, that A belongs to B through another middle term, and that B belongs to C in the same way.

For those who make deductions in accord with belief, that is, only dialectically, it is clear that the only thing that must be investigated is whether the deduction proceeds from the most acceptable premises possible, so that even if there is not in truth any middle term between A and B, but there is believed to be one, anyone who makes

41. Reading φανερὸν οὖν . . . καὶ τὴν προτέραν.

a deduction through it has deduced dialectically. But with a view to truth, one must investigate by proceeding from what actually belongs. It is like this: since it is possible for one thing to be predicated of another non-coincidentally—by "coincidentally" I mean, for example, when we say that this white thing is a human being, not meaning the same as when we say that the human being is white. For the human being is not white by being another thing, while the white thing is a human being because the human being is coincidentally white—it is possible, then, that some things are such that they are predicated intrinsically.

Let C, then, be such that it no longer belongs to something else, and let B belong to it in the primary way (that is, there is no other thing between them). And, again, let E belong to F in the same way, and F to B. Is it necessary for this to come to a stop, or is it possible for it to go on without limit?

Again, if nothing is predicated intrinsically of A and A belongs to H in the primary way, and to nothing prior in between, and if H belongs to G, and this to B, is it necessary for this too to come to a stop, or is it possible for it too to go on without limit? This case differs from the previous one in that the first is of whether it is possible, by starting from something that belongs to no other thing while something else belongs to it, to go on upward without limit; while in the second, starting from something that belongs to something else while nothing is predicated of it, one investigates whether it is possible to go on downward without limit.

Further, is it possible for there to be unlimited intermediates if the extremes are determinate? I mean, for example, if A belongs to C, and B is a middle term between them, and between B and A there are others, and others between these, is it possible for even these to be unlimited, or is it impossible? This is the same as investigating whether demonstrations can go on without limit and whether there can be demonstration of everything, or whether terms are bounded at each other.[42]

I say the same thing too in the case of privative deductions and premises—for example, if A does not belong to any B, either it does not belong to B in the primary way or else there will be some intermediate to which—as prior—it does not belong (for example, G, which belongs to every B), and, again, to yet another term prior to this (for example, H, which belongs to every G). For in these cases too either the prior terms to which A belongs are unlimited or they come to a stop.

But in the case of terms that convert it is not the same way. For among terms that are counterpredicated there is none that is predicated in the primary way or finally; for all are in this respect, at least, similarly related to all, and if[43] the terms predicated are unlimited, the things we were puzzled about are unlimited in both directions—unless it is possible that they do not convert in the same way, but one as a coincident and the other as a predicate.[44]

42. I.e., are in direct contact, with no middle term.
43. Reading εἴτ'. . . ἐπ'.
44. The difference is explained at 83^a14–19.

1.20
Fixed Extremes and Unlimited Middles

It is clear that it is not possible for the intermediates to be unlimited if both the upward and the downward predications come to a stop. (By "upward" I mean the route toward what is more universal and by "downward" the one toward what is particular.) For if A is predicated of F, and the intermediates (the Bs) are unlimited, it is clear that it would be possible both for one thing to be predicated of another from A downward without limit—for before reaching F there would be unlimited middle terms—and also from F upward, before reaching A, unlimited ones. So if these are impossible, it is also impossible for there to be unlimited terms intermediate between A and F.

For even if someone were to say that some of ABF are contiguous to each other, so that there is nothing intermediate between them, while the others are impossible to take,[45] it makes no difference. For whichever of the Bs I take, the intermediates in the direction of A or of F will either be unlimited or not. Whichever one, then, is the first after which they are unlimited, whether immediate or non-immediate, makes no difference; for the ones after these are unlimited.

1.21
Privative Demonstrations Come to a Stop

It is evident too that a privative demonstration will come to a stop if indeed a positive one comes to a stop in both directions. For suppose that it is not possible either to go on upward without limit from the last (I call "last" the term that belongs to no other, **82b1** although another belongs to it—for example, F [above]), or to go on downward from the first to the last (I call "first" the term that is itself said of another, although no other is said of it). If this is so, it will come to a stop also in the case of negation.

For there are three ways that not belonging can be proved. For in one case B belongs to everything to which C does and A belongs to nothing to which B does. With regard to BC, then, and always in the case of the second interval, it is necessary to proceed toward immediates; for this interval is positive. As for the other term, it is clear that if it does not belong to anything prior, for example, D, this one will have to belong to every B. And if it, again, does not belong to anything else prior to D, that one will have to belong to every D. So, since the upward route comes to a stop, the route to A will also come to a stop, and there will be some first term to which it does not belong.

Again, if B belongs to every A and to no C, A will belong to no C. And again, if one must prove this, it is clear that it will be proved either in the way above, in this

45. Because they are unlimited.

way, or in the third way. The first way has been described, and the second will now be proved. If one proves in this way, for example, that D belongs to every B and to no C,[46] then it is necessary for something to belong to B. And if this, again, is not going to belong to C, [one must get that] something else does belong to D and does not belong to C. Since, then, belonging to something ever higher comes to a stop, not belonging will also come to a stop.

The third way that was mentioned is this: if A belongs to every B and C does not belong to B, C does not belong to everything to which A belongs. This, again, will be proved either in the ways described above or else in a similar way [to this one]. In the former ways, certainly, it comes to a stop, but if it is in the latter way, one will again get that B belongs to E, but C does not belong to every E. And so on in the same way. But since it was assumed that in the downward direction too it comes to a stop, it is clear that C's not belonging will also come to a stop.

It is evident that even if something is not proved by one route but by all of them—sometimes in the first figure, sometimes in the second or third, it will come to a stop even so. For the routes are limited, and limited things taken limited times are necessarily limited.

It is clear, then, that it comes to a stop in the case of privations, if indeed it does so in the case of belonging. That it does so in the latter case will be evident if we get a theoretical grasp on the issue logico-linguistically, as follows.

1.22
When Either Extreme Is Fixed, Affirmative Premises Must Be Limited

This is clear in the case of things predicated in the what-it-is; for if it is possible to define something, or if its essence is knowable, but it is not possible to go through an unlimited number of things, the things predicated in its what-it-is must be limited.

We argue universally as follows. It is indeed possible to say truly that a white thing is walking and that the large thing there is a log, and, again, that a log is large and a human is walking. But it is one thing to say the former and quite another to say the latter. For when I say that a white thing is a log, I say that something that is coincidentally white is a log, but not that the white thing is of the log as its underlying subject; for in fact it is not the case that, being white or precisely a sort of white, it came to be a log—so it is not a log, except coincidentally. But when I say that a log is white, I do not say that another thing is white and that that thing is coincidentally a log, as when I say that a musical thing is white (for then I am saying that a human, who is coincidentally musical, is white). Instead, the log is the underlying subject, which is precisely what came to be white, without being another thing than precisely a log or a sort of log. If,

46. Reading δεικνύῃ, restoring ὅτι, and omitting εἰ.

then, one must legislate, let speaking in the latter way be predicating, and speaking in the former either not predicating at all or else predicating not unconditionally but coincidentally. (What is predicated is like the white, what it is predicated of is like the log.)

Let it be assumed, then, that what is predicated is always predicated unconditionally, and not coincidentally, of what it is predicated of; for this is how demonstrations demonstrate. So when one thing is predicated of another, either it is in that thing's what-it-is or it says that the latter has some quality or quantity, or is relative [to something], or is doing something, or is being affected by something, or is somewhere, or somewhen.

Further, terms that signify substance signify precisely that thing of which they are predicated, or precisely that sort of thing. Those, on the other hand, that do not signify substance, but are said of some underlying subject that is neither precisely what that thing is nor precisely what sort of thing that thing is, are coincidents—for example, white is a coincident of a human. For the human is neither precisely white nor precisely a sort of white, but rather an animal, presumably; for a human is precisely an animal. But terms that do not signify substance must be predicated of some underlying subject, and there cannot be anything white that is not white by being some other thing. (For one must say goodbye to the Forms; for they are just noise, and if there are any, they are irrelevant to the account; for demonstrations are concerned with these other sorts of things.)

Further, if it is not possible for this to be a quality of that and that of this, that is, a quality of a quality, it is impossible for things to be counterpredicated of each other in this way. On the contrary, although it is possible to say something true, it is not possible to counterpredicate truly.

Otherwise, indeed, a term will be predicated as substance, that is, as kind or difference of what it is predicated of. But it has been proved that these terms will not be unlimited, either downward or upward. For example, neither [the upward series] human is two-footed, two-footed is animal, animal is something else, . . . ; nor [the downward series] animal [predicated] of human, human of Callias, and Callias of something else in the what-it-is. For every substance of this sort can be defined, but one cannot go through an unlimited number of things in thought. So they are not unlimited either upward or downward. For it is impossible to define a substance of which unlimitedly many things are predicated. Nor, on the other hand, will things be counterpredicated of each other as kinds; for then each would be precisely a sort of itself. Nor, indeed, can anything be predicated of a quality or the rest, unless it is predicated coincidentally; for these are all coincidents and are predicated of substances.

But then neither can they be unlimited in the upward direction; for something that signifies either a quality, or a quantity, or something of this sort, or else one of the things in the substance, is predicated of each of these. But the latter are limited, and the kinds of predicate are limited—either quality, quantity, relative, doing, being affected, where, or when.

It is assumed, then, that one thing is predicated of one thing, and that whatever things are not what something is are not predicated of themselves. For these are all coincidents (although some are intrinsic, while some belong in another way); and we say that all of them are predicated of an underlying subject, while what is coincident is not an underlying subject; for we posit nothing to be of this sort that is not said [to be] what it is said [to be] by being another thing; rather, it is itself predicated of another thing.[47]

Neither in the upward direction, therefore, nor in the downward one, will one thing be said to belong to one thing. For the coincidents are all said of things included in the substance of each thing, and these are not unlimited; and in the upward direction there are both these things and their coincidents, and neither of these is unlimited. Therefore, it is necessary for there to be something of which something is predicated in the primary way, and something else of this, and for this to come to a stop, and for there to be things that are no longer predicated of anything else that is prior and of which nothing else prior is predicated.

This is one way of demonstrating the claim, but there is yet another. If there is a demonstration of things that some prior thing is predicated of, and if for the things of which there is demonstration one cannot either be in a better condition in relation to them than by knowing them, or know them without a demonstration, and if one thing is known through others, and we neither know these others nor are in a better condition in relation to them than by knowing them, then we will not have scientific knowledge of what is known through them.

If, then, it is possible to know something unconditionally through demonstration, and neither from something else nor on the basis of a hypothesis, it is necessary for the intermediate predicates to come to a stop. For if they do not come to a stop and there is always something above whatever term has been taken, there will be a **84^a1** demonstration of all of them. So if it is not possible to go through unlimited things, we will not know through demonstration things of which there is a demonstration. If, then, we are not in a better condition in relation to them than by knowing them, it will not be possible to have scientific knowledge of anything through demonstration unconditionally, but only on the basis of a hypothesis.

From a logico-linguistic point of view, then, on the basis of these considerations, one might be persuaded of what we said; but from the point of view of analytics, the following considerations make it evident in a more concise way that predicates cannot be unlimited either upward or downward in the demonstrative sciences with which our investigation is concerned.

For demonstration has to do with what belongs intrinsically to things. But what is intrinsic is twofold; for it includes both the things that belong to something by being present in its what-it-is, and also the things in whose what-it-is that thing belongs. For example, the odd in relation to number: odd belongs to number and

47. Deleting καὶ τοῦτο καθ' ἑτέρου.

number itself is present in the account of it; and, again, magnitude and divisibility, which are present in the account of number. It is not possible for either of these to be unlimited—for example, as odd is related to number; for then there would again be something else belonging to odd in which odd was present; and if this is the case, number will be present in a primary way in what belongs to it. If, then, it is not possible for unlimitedly many things of this sort to belong in the [what-it-is of] one thing, they will not be unlimited in the upward direction either. But then, it is necessary for all of them, at any rate, to belong to the primary one, that is, to number, and number to them, so that they will convert and not exceed it. Nor, again, can those present in the what-it-is be unlimited; for then it would be impossible for it to be defined.

So if all the predicates are said of things intrinsically, and these are not unlimited, then the ones in the upward direction will come to a stop, and so in the downward direction too. And if this is so, the ones intermediate between two terms will also always be limited.

But if this is so, it is at the same time clear too that it is necessary for there to be starting-points of demonstrations, and that there cannot be demonstration of everything (which as we said at the start[48] is precisely what some people claim). For if there are starting-points, it is not the case that everything is demonstrable, nor is it possible to proceed without limit. For either of these being the case amounts to nothing other than there being no immediate and indivisible intervals, but all being divisible. For it is by inserting a term in between, and not by adding an additional one, that what has been demonstrated is demonstrated. So if it were possible for this to go on without limit, it would be possible for there to be unlimitedly many middle terms between two terms. But this is impossible if the predicates come to a stop in the upward and **84b1** downward directions. And that they do come to a stop we have proved from the logico-linguistic point of view earlier and from that of analytics just now.

1.23
Two Corollaries

Now that this has been proved, it is evident that if the same term belongs to two things (for example, A belongs to both C and D), neither of which is predicated of the other (either not at all or not in every case), then it will not always belong in virtue of something common. For example, having angles equal to two right angles belongs to isosceles and scalene in virtue of something common (for it belongs to them insofar as they are a certain sort of figure and not insofar as they are something else). But this is not always so. For let B be that in virtue of which A belongs to C and D. It is clear, therefore, that B too belongs to C and D in virtue of another thing that is common, and that thing in virtue of something else, so that unlimitedly

48. 72b6–7.

many terms would fall between two terms. But this is impossible. Therefore, it is not necessary for the same term always to belong to several things in virtue of something common, if indeed there are to be immediate intervals.

It is necessary, however, that the terms be in the same kind and come from the same immediate premises, if indeed the common thing is to be something belonging to them intrinsically; for, as we saw,[49] it is impossible for what is proved to cross from one kind to another.

It is evident too that when A belongs to B, if there is a middle term, it will be possible to prove that A belongs to B, and the elements of this proof are these[50] and are the same in number as the middle terms; for the immediate premises are the elements, either all of them or [just] the universal ones. But if there is no middle term, there is no demonstration; instead, this is the route to the starting-points.

Similarly, if A does not belong to B, if there is a middle, or rather a prior, term to which A does not belong, there is a demonstration, but if there is no such term, there is no demonstration, but rather a starting-point. And there are as many elements as terms; for the premises containing these terms are the starting-points of the demonstration. And just as there are some indemonstrable starting-points which say that this is this (that is, that this belongs to this), so too there are some that say that this is not this (that is, that this does not belong to this). So there will be starting-points saying that something is [the case] and others saying that something is not [the case].

When one has to prove something, one must assume what is predicated in the primary way of B. Let it be C; and of this let D be similarly predicated. If one always proceeds in this way, no outside premise or [term] not belonging to A will ever be assumed in the proof. Instead, the middle terms will always be thickened until they become indivisible and a unit. And when they become immediate, they are a unit, and the immediate premise is the premise that is unconditionally a unit. And just as in other areas, the starting-point is something simple, but this is not the same everywhere; instead, in weight it is the mina, in a melody it is the quarter-tone, and something else in something else. Likewise, in a deduction the unit is an immediate premise, and in demonstration and scientific knowledge it is understanding.

In deductions proving that something belongs, nothing falls outside, while in privative ones, it is in one case—that is, when the thing does not belong[51]—that nothing falls outside the thing. For example, suppose A does not belong to B through C (for suppose C belongs to every B and A to no C): if one next has to prove that A belongs to no C, one must assume a middle term between A and C; and one will always proceed like this.

49. 1.7.
50. Reading ταῦτα.
51. Reading μὴ ὑπάρχειν.

And if one has to prove that D does not belong to E, due to C belonging to every D and to no E, the middle term will never fall outside E (this is the term to which it must belong).

In the case of the third way, the middle term will never go outside either the term of which one must predicate a privation or the term one must predicate privatively.

1.24
The Superiority of Universal Demonstration

Some demonstrations are universal, others particular, and some are positive, others privative, and there is a dispute about which ones are better. It is the same way too concerning demonstrations that are called demonstrative and those by reducing to the impossible. First, then, let us investigate universal and particular demonstrations; and when we have made the issue clear there, let us speak about the ones that are called demonstrative and those by reducing to the impossible.

It might perhaps seem to some people, if they investigate in the following way, that particular demonstration is better. For if a demonstration by which we more know scientifically is a better demonstration (for this is a virtue characteristic of demonstration), and if we more know something scientifically when we know it intrinsically, rather than in virtue of something else (for example, we know musical Coriscus better when we know that Coriscus is musical than when we know that a human[52] is musical; and likewise in other cases), and if a universal demonstration proves that something else, and not the thing itself, is in fact such-and-such (for example, that the isosceles is in fact such-and-such, not because it is isosceles but because it is a triangle), while a particular one proves that the thing itself is in fact such-and-such—if, then, intrinsic demonstration is better, and if particular demonstration rather than universal demonstration is of this sort, particular demonstration will also be better.

Further, if the universal is not something beyond the particulars; and if a demonstration produces a belief that the thing with regard to which it demonstrates is something, that is, that it is a sort of nature belonging among the things that there are (for example, a nature of a triangle beyond the particular sorts, that of a shape beyond the particular sorts, and that of a number beyond the particular sorts); and if a demonstration is better when it concerns something that is rather than something that is not; and one through which we will not be deceived is better than one through which we will be deceived; and if the universal demonstration is of this latter sort (for, as they proceed, they prove things as they do in the case of proportion, for example, that whatever is of such-and-such a sort—neither line nor number nor solid nor

52. Reading ἄνθρωπος.

plane, but something beyond these—will be proportional)—if, then, it is universal demonstration that is more like this, and if it is less concerned with what is than is **85^{b}1** particular demonstration, and if it produces a false belief, universal demonstration will be worse than particular demonstration.

Or rather, first, does the other argument not apply any more to universal demonstration than to particular demonstration? For if having angles equal to two right angles belongs to something not insofar as it is isosceles but insofar as it is a 5 triangle, someone who knows that an isosceles has angles equal to two right angles knows it less, insofar as it is itself, than someone who knows that a triangle does. And, in general, if it is not insofar as it is a triangle that [having angles equal to two right angles] belongs to it, and then one proves it to belong, it will not be a demonstration. But if this is the case, the one who knows each thing insofar as it belongs knows better. If, then, triangle extends further than isosceles, and the account is the same (that is, if triangle is not said of things homonymously), and if having 10 angles equal to two right angles belongs to every triangle, then it is not the triangle insofar as it is isosceles but rather the isosceles insofar as it is a triangle that has such angles. So someone who knows universally knows it more insofar as it belongs than someone who knows particularly. Therefore, the universal demonstration is better than the particular one.

Further, if the universal [is defined by] a single account, and not a homonymy), it 15 will be no less than some of the particulars, but actually more so, inasmuch as what is incapable of passing away is found among universals, while the particulars are capable rather of passing away. Further, there is no necessity to suppose that the universal is something beyond these, on the grounds that it indicates one thing, any more than in the case of the other things that signify not a what [something is] but either a 20 quality, a quantity, a relative, or a doing. Therefore, if this is supposed, it is not the demonstration but the listener that is the cause.

Further, if demonstration is probative deduction of a cause and the why, and the universal is more of a cause (for that to which something belongs intrinsically is itself the cause of this belonging; but the universal is primary; therefore, the universal is 25 the cause), the result is that the [universal] demonstration is also better; for it is more of the cause and the why.

Further, we seek the why up to a certain point, and we think we know something when it is not the case that it is because of something else that it comes about or is; for the last term is in fact an end or limit in this way. For example, for the sake of what did he come? In order to get the money, and this in order to pay back what he 30 owed, and this in order not to act unjustly. And proceeding in this way, when it is no longer because of something else or for the sake of something else, we say that it is because of this as end that he came (or that the state of affairs is or comes about), and that then we most of all know why he came. If, then, the same holds in the case of all causes and all whys, and if in the case of causes for-the-sake-of-which we most 35 of all know in this way, in the other cases too we most of all know when the thing in

question no longer belongs because of something else. When, then, we know that the exterior angles are equal to four right angles because it is isosceles, it still remains to
86ᵃ1 ask why the isosceles is so: because it is a triangle, and this because it is a rectilinear figure. And if this is no longer so because of something else, it is then that we most of all know. And it is then too that our knowledge is universal. Therefore, the universal demonstration is better.

Further, the more particular a demonstration is, the more it falls within the province of the unlimited, while universal demonstration falls within the province of the
5 simple and the limit. But insofar as things are unlimited, they are not scientifically knowable, while insofar as they are limited, they are scientifically knowable. Therefore, they are more scientifically knowable insofar as they are universal than insofar as they are particular. Therefore, universals are more demonstrable. And of things that are more demonstrable there is more of a demonstration (for correlatives increase concomitantly). Therefore, the universal demonstration is better since it is more of a demonstration.

10 Further, if a demonstration in virtue of which one knows both this and something else is more choiceworthy than one in virtue of which one knows this alone, and if someone who possesses a universal demonstration knows the particular thing too, while the latter does not know the universal one,[53] the result is that in this way too universal demonstration will be more choiceworthy.

Further, also in the following way. For proving a universal is more a matter of proving through a middle term that is nearer the starting-point. And the immediate
15 is nearest; indeed, it is a starting-point. If, then, a demonstration that proceeds from a starting-point is more exact than one that does not proceed from a starting-point, a demonstration that proceeds more from a starting-point is more exact than one that does so less. But the universal demonstration is more like this. Therefore, [the more] universal demonstration will be better. For example, if one had to demonstrate that A belongs to D, with B and C as middle terms, B being higher: the result is that a
20 demonstration through B is more universal.

Though some of the points we have made are logico-linguistic, it is above all clear that the universal demonstration has the most control, because in getting hold of a premise that is prior we also in a way know the one that is posterior to it, that is, we get hold of it potentially. For example, if one knows that every triangle has angles
25 equal to two right angles, one in a way also knows of the isosceles that it has angles equal to two right angles; one knows it potentially, even if one does not know of the isosceles that it is a triangle. But one who gets hold of the latter premise does not in any way know the universal, neither potentially nor actually.

30 Also, the universal is intelligible, while the particular ends up in perception.

53. Reading τὸ καθόλου.

1.25
Superiority of Probative Demonstration

Let us say this much, then, about why universal demonstration is better than particular demonstration. That probative demonstration is better than privative demonstration will be clear from what follows.

For let a better demonstration, other things being equal, be one that proceeds from fewer postulates, hypotheses, or premises. For if these are equally known, knowledge will accrue more quickly in this way, and this is more choiceworthy.

The argument for the proposition that a demonstration proceeding from fewer things is better is, generally speaking, as follows. For if the middle terms are taken to be equally known, and the prior terms better known, let one demonstration be that A belongs to E through the middle terms B, C, and D, and let the other demonstration be that A belongs to E through F and G. Then that A belongs to E and that A belongs to D are on the same level. But that A belongs to D is prior to and better known than that A belongs to E; for the latter is demonstrated through the former; and that through which something is demonstrated is the more persuasive of the two. Therefore, a demonstration through fewer things is also better, other things being equal.

Both probative demonstration and privative demonstration are proved through three terms and two premises, but the one assumes that something is the case, while the other assumes both that something is the case and that something is not the case. Therefore, the latter proceeds through more things,[54] and so is worse.

Further, since it has been proved[55] that it is impossible for a deduction to be produced when both premises are privative, and that it must be that [only] one premise is privative while the other says that something belongs, in addition to the former one must get the latter. For as a demonstration increases,[56] it is necessary for the positive premises to become more numerous, while it is impossible for there to be more than one privative premise in any deduction. For let A belong to no B and B belong to every C. If one must next increase both premises, one must put in a middle term. Let it be D between A and B and E between B and C. It is evident that E is positive, while D is said positively of B, but in relation to A is posited as privative. For D is predicated of every B, and A must belong to no D. There is, then, [only] one privative premise, AD.

It is the same way too in the case of the other deductions. For the middle term for the positive terms is always affirmative in both directions, while in the case of the privative terms, it is necessary for it to be privative in one of the two, so that [only] one premise of this sort is produced, the others being positive.

54. Since it involves negation.
55. *APr.* 1.4–6, $41^{b}6$–7.
56. $78^{a}14$–21.

If, then, that through which something is proved is the better known and more persuasive of the two, and if privative demonstration is proved through positive demonstration while the latter is not proved through the former, positive demonstration, being prior, better known, and more persuasive, will be better.

Further, if the universal immediate premise is a starting-point of deduction, and if the universal premise is affirmative in probative demonstration and negative in privative demonstration, and if an affirmative premise is prior to and better known than a negative one (for it is through the affirmation that the negation is known, and the affirmation is prior, just as being is prior to not being), the result is that the starting-point of probative demonstration is better than that of privative demonstration, and a demonstration that makes use of better starting-points is better.

Further, they are more like starting-points; for without a probative demonstration there is no privative demonstration.

1.26
Superiority of Direct Demonstration

87a1 Since positive demonstration is better than privative demonstration, it is clear that it is also better than demonstration by reducing to the impossible. But one must know what the difference is between them.

Let, then, A belong to no B and B to every C. It is necessary, then, that A belong to no C. If the assumptions are made in this way, the privative demonstration that A does not belong to C will be probative. But the demonstration by reducing to the impossible goes this way: if one must prove that A does not belong to B, one must assume that it does belong, and that B belongs to C, so that it follows that A belongs to C. But let it be known and agreed that this is impossible. Therefore, it is not possible for A to belong to B. If, then, it is agreed that B belongs to C, it is impossible for A to belong to B.

The terms, then, are ordered in the same way, but which privative premise is more known makes a difference—that A does not belong to B or that A does not belong to C. When the conclusion (that it is not the case) is more known, a demonstration by reducing to the impossible comes about; when the premise inside the deduction is more known, a demonstrative proof does. For by nature the AB premise is prior to the AC premise, for the premises from which the conclusion is deduced are prior to the conclusion. For that A does not belong to C is a conclusion, while that A does not belong to B is something from which the conclusion is deduced. For if something happens to be denied, it does not follow that this is a conclusion and the others the premises from which it was deduced; on the contrary, the premises of a deduction stand in the relation of whole to part or of part to whole, but the AC and BC premises are not related to each other in this way.

If, then, a demonstration that proceeds from what is more known and prior is better, and if in both these sorts of demonstration[57] conviction proceeds from something not being the case, but in the one from something prior and in the other from something posterior, a privative demonstration will be unconditionally better than a demonstration by reducing to the impossible. So too positive demonstration, which is better than privative demonstration, will also be better than demonstration by reducing to the impossible.

1.27
The Relative Exactness of Sciences

One science is more exact than another, and prior to it, if it is both of the that and the why, and not of the that separately from the why; and if it does not have an underlying subject, while the other does have an underlying subject (as, for example, arithmetic is more exact than harmonics); and if it makes fewer assumptions, while the other depends on some additional assumption (for example, arithmetic is more exact than geometry). By "an additional assumption" I mean, for example, that a unit is a substance that does not have a position and a point is a substance that has a position—the latter depends on an additional assumption.

1.28
The Unity of a Science

A science is one when it is of one kind—of whatever things are composed of the primary things and are intrinsically parts or affections of these. One science is distinct from another when their starting-points are neither composed of the same things nor are those of the one composed of those of the other. There is a sign of this when one arrives at the indemonstrables. For they must be the same in kind as the things demonstrated. And there is also a sign of this when the things proved through these are in the same kind, that is, are homogenous.

1.29
Multiple Demonstrations of the Same Thing

It is possible for there to be several demonstrations of the same thing, not only when one takes non-continuous middle terms from the same column (for example, C, D, and F for AB), but also when the columns are distinct. For example, let A be

57. I.e., the privative one and the one by reducing to the impossible.

changing, D being moved, B being pleased, and then G coming to rest. It is true, then, to predicate D of B and A of D; for anyone who is being pleased is being moved and what is being moved is changing. Again, it is true to predicate A of G and G of B; for everyone who is being pleased is coming to rest[58] and one who is coming to rest is changing. So the deductions proceed through distinct middle terms that do not come from the same column. (It is not, though, that neither of the middle terms is said of the other; for it is necessary for both to belong to one and the same thing.)

One must also investigate in how many ways it is possible to produce a deduction of the same thing in the other figures.

1.30
No Demonstration of What Happens by Luck

Of what happens by luck, there is no scientific knowledge through demonstration. For what happens by luck is neither necessary nor for the most part, but is rather something that comes about outside these; but demonstration is of one or the other of these. For every demonstration proceeds either through premises that are necessary or through premises that hold for the most part. And if the premises are necessary, the conclusion is necessary too, but if they hold for the most part, so too does the conclusion. So if what happens by luck is neither necessary nor for the most part, there will be no demonstration of it.

1.31
No Demonstration through Perception

Nor is it possible to have scientific knowledge through perception. For even if perception is of a such-and-such and not of a this something, what you perceive, at any rate, is necessarily a this something that is in a place and at a time. But it is impossible to perceive what is universal and holds in every case; for no universal is a this [something] or at a particular time; for otherwise it would not be universal; for it is what is always and everywhere that we say is universal.

Since, then, demonstrations are universal, and universals cannot be perceived, it is evident that it is not possible to have scientific knowledge through perception either. On the contrary, it is clear that even if it were possible to perceive that a triangle has angles equal to two right angles, we would seek a demonstration of it and would not,

58. *Rh*. 1369ᵇ33–35.

as some people say,[59] have scientific knowledge of it; for, necessarily, what we perceive are particulars, while scientific knowledge is to know the universals.

That is why, if we were on the moon and saw the earth interposed, we would not know the cause of the eclipse. For we would perceive that it is now eclipsed but not at all why. For the perception was not of the universal. Nonetheless, if we observed this happening often, after having hunted down the universal, we would have a demonstration; for it is from many particulars that the universal becomes clear.

But the universal is estimable because it makes clear the cause. So, where the cause of things is distinct from the things themselves, universal demonstration is more estimable than perceptions or understanding. Concerning the primary things, though, another account [is needed].

It is evident, then, that by perceiving it is impossible to have scientific knowledge of anything demonstrable—unless one calls perceiving just this: to have scientific knowledge through demonstration.

Nonetheless, some of our problems can be traced back to a want of perception. For in some cases if we saw we would not inquire—not because we know by seeing but because we grasp the universal from seeing. For example, if we saw the crystalline stone with a hole in it and the light passing through it, it would also be clear why—when it is also the case that because of seeing[60] it separately in a given case, we at once understand that it is like this in every case.

1.32
Not All Deductions Can Have the Same Starting-Points

It is impossible for all deductions to have the same starting-points. First, let us get a theoretical grasp on this logico-linguistically.

In fact, some deductions are true and some false. For even if it is possible to deduce a truth from falsehoods, this comes about only once—for example, if A is true of C but B, the middle term, is false, for then A does not belong to B nor B to C. But if middle terms are assumed for these premises, they will be false, because every false conclusion is deduced from falsehoods, while true conclusions are deduced from truths. But falsehoods and truths are distinct.

Next, not even falsehoods are deduced from the same things as each other; for there are falsehoods that are contrary to each other and cannot be the case at the same time—for example, that justice is injustice or cowardice, that a human being is a horse or cow, or that what is equal to something is greater or less than it.

On the basis of what has been established, on the other hand, [we get our theoretical grasp] as follows; for not even all truths have the same starting-points. For

59. E.g., Protagoras, who equates knowledge with perception.
60. Reading καὶ εἰ διὰ τό.

the starting-points of many of them are distinct in kind and do not apply to each other—for example, [those that apply] to units do not apply to points; for units do not have position while points do have it. But it is necessary, at any rate, [for any that do apply] to apply either to middle terms (either from above or from below) or to have some terms placed inside or to some outside.[61]

But it is not possible, either, for there to be some common starting-points from which everything will be proved (by "common starting-points," I mean, for example, that everything must be affirmed or denied). For the kinds of the beings are distinct, and some things belong to quantities alone and others to qualities alone, and it is with the help of these that a proof is given through the common things.

Further, the starting-points are not much fewer than the conclusions; for the premises are starting-points, and the premises involve either adding a term or inserting one in between.[62]

Further, the conclusions are unlimited, the terms limited.

Further, some starting-points are necessary, others contingent.

When we investigate in this way, it is impossible for the starting-points to be the same and limited if the conclusions are unlimited. But if someone took the claim[63] in another way, saying, for example, that these ones here are the starting-points of geometry, these ones here of [arithmetic] calculation, these ones here of medicine, what else would he be saying except that sciences have starting-points? But it is ridiculous to say that the starting-points are the same because they are the same as themselves; for in that way everything turns out to be the same.

Neither does the claim that anything whatsoever is to be proved from all things amount to seeking the same starting-points for all things; for this is too simple-minded. For this is not what happens in the mathematical sciences that are evident, nor is it possible on analysis; for the immediate premises are starting-points, and a different conclusion is reached when an additional immediate premise is added. And if someone were to say that the primary immediate premises are the ones that are starting-points, there is one in each kind.

But if the claim is neither that everything must be proved from all the starting-points nor that they are distinct in that there are different ones for each science, it remains that the starting-points of all things are in the same kind even though these [conclusions] proceed from those [starting-points], and those from these other ones. But it is evident that this is not possible either; for it has been proved that the starting-points of things that are different in kind are themselves different in kind. For starting-points are of two sorts, those from which and those about which; and while the former are common, the latter are special—for example, number and magnitude.

61. 78b13, 87a16.

62. 84a36.

63. I.e., that all deductions have the same starting-points.

1.33
Scientific Knowledge and Belief

What is scientifically knowable and scientific knowledge are different from what is believable and belief; that is because scientific knowledge is universal and through necessities, and what is necessary does not admit of being otherwise. But there are some things that are true and are the case, although they also admit of being otherwise. It is clear, then, that concerning these things there is no scientific knowledge; for otherwise what admits of being otherwise would not admit of being otherwise. But then neither is there understanding (for by "understanding" I mean a starting-point of scientific knowledge), that is, non-demonstrative scientific knowledge; and this is the supposition of an immediate premise. But understanding, scientific knowledge, and belief are true, and so is what is said to come through them. So it remains for belief to be concerned with what is true or false but admits of being otherwise. And this is the supposition of a premise that is immediate[64] and not necessary.

And this agrees with what appears to be so; for belief is unstable, and so is the nature [it is concerned with]. In addition, no one thinks that he believes something when he thinks that it does not admit of being otherwise, but rather that he has scientific knowledge of it. On the other hand, when he thinks that something is so but that nothing prevents it from being otherwise, then he thinks that he believes, on the supposition that belief applies to this sort of thing but scientific knowledge to what is necessary.

How, then, is it possible to believe and have scientific knowledge of the same thing, and why is belief not scientific knowledge, if one posits that everything one knows it is possible to believe? For the knower and the believer will follow the same path through the middle terms until they come to the immediates, so that if indeed the former knows, the believer knows too. For just as it is possible to believe the that, it is also possible to believe the why, and this is the middle term.

Or if one supposes what does not admit of being otherwise in the way one possesses[65] the definitions through which demonstrations proceed, will one then not believe but have scientific knowledge? But if one supposes them to be true but not that the things in question belong in virtue of the substance and in virtue of the form, will one then believe and not truly have scientific knowledge? Will one believe both the that and the why if one's believing has come through intermediates, and only the that if it has not come through intermediates?

But there cannot be belief and scientific knowledge about the same thing in every way. Instead, just as in a certain way there can be both false and true belief about the same thing, so there can be both scientific knowledge and belief about the same thing. For in fact if there is true and false belief about the same thing in the way

64. Perhaps simply meaning "not demonstrated" in this instance.
65. Reading ἔχει.

some people say, it follows that one is committed to absurdities, in particular, that one does not believe what one falsely believes. But since things are said to be the same in several ways, in one way it is possible and in another way it is not. For to
30 believe truly that the diagonal is commensurable is absurd. But because the diagonal with which the beliefs are concerned is the same, in this way they are about the same thing—although the essence of each that is in accord with the account is not the same. In the same way, there is both scientific knowledge and belief about the same thing. For the former is about an animal in such a way that it does not admit of not being an animal, the latter in such a way that it does admit of it—for example, if the
35 former is about what is precisely a human being and the latter about a human being but not what is precisely a human being. The thing is the same because it is a human being, but the way [they are about it] is not the same.

It is evident from these considerations that it is not possible to believe and to have scientific knowledge about the same thing at the same time. (For then one would at the same time have a supposition that the same thing admits of being otherwise
89b1 and does not admit of being otherwise. And this is precisely what is not possible.) In distinct people it is possible for there to be each of these about the same thing, as was said. But in the same person it is not possible even in this way. For he would at the same time have a supposition, for example, that a human being is precisely an animal (for this, we saw, is what it is for it not to be possible for a human being not to be an
5 animal) and also not precisely an animal (for let this be what it is for it to be possible).

As for how to distribute the remaining [objects of cognition] among thought, understanding, scientific knowledge, craft knowledge, practical wisdom, and theoretical wisdom—this is rather a matter in part for natural science and in part for the theoretical investigation of ethics.[66]

1.34
Acumen

10 Acumen is a sort of good guesswork that hits on the middle term in an imperceptible amount of time. For example, if someone sees that the moon always has its bright side toward the sun and quickly understands why this is so (because it gets its light from the sun); or knows why someone is speaking to a rich person (because he is borrowing money); or why people are friends (because they are enemies of the same person). For on seeing the extremes, one gets knowledge of all the causes, the middle
15 terms. A is having its bright side toward the sun; B is getting light from the sun; C is the moon. B (getting light from the sun) belongs to C (the moon); and A (having its bright side toward that from which it gets its light) belongs to B, so that A belongs
20 to C through B.

66. *DA* 3.4–7, *NE* 6.3–8.

BOOK 2

2.1
The Four Scientific Questions

The things we inquire about are equal in number to the things we have scientific knowledge of. And we inquire about four things: the that, the why, whether something is, what something is. For when we inquire as to whether this or that is the case, positing a number of terms (for example, whether the sun is eclipsed or not), we are inquiring about the that. A sign of this is that, on finding that it is eclipsed, we stop; and if from the start we know that it is eclipsed, we do not inquire about whether it is. But when we know the that, we inquire about the why—for example, when we know that it is eclipsed or that the earth moves, we inquire about why it is eclipsed or why it moves.

These, then, we inquire about this way. But some things we inquire about in another way—for example, whether there is or is not a centaur or a god. (I mean whether there is unconditionally one or not, not whether it is white or not.) And when we have come to know that it is, we inquire about what it is—for example, what, then, is a god? or what is a human being?

2.2
The Search for a Middle Term

These, then, are the things we inquire about and which—when we have discovered them—we know, and this is how many they are. And when we are inquiring about the that or whether something is unconditionally, we are inquiring about whether or not there is a middle term for it; and when, having come to know either the that or whether the thing is (whether partially or unconditionally), we inquire in turn about the why or the what-it-is, we are then inquiring about what the middle term is. (Partially or unconditionally: I mean by "partially" is the moon eclipsed? or is it **90^a1** waxing? For in such cases we are inquiring about whether it is or is not something. By "unconditionally" I mean whether there is or there is not a moon or night.)

It follows, therefore, that in all our inquiries we are inquiring either about whether there is a middle term or what the middle term is. For the middle term is the cause, and in all cases it is the cause that is being inquired about. Is it eclipsed? Is there some cause or not? After that, having come to know that there is one, we inquire about what it is. For the cause of a substance being not this or that but being unconditionally, or of its being not unconditionally but rather being one of the things that belong to it intrinsically or coincidentally—this is the middle term. (By "what is unconditionally" I mean the underlying subject—for example, the moon, earth, sun,

or triangle; and by "one of the things that belong to it" I mean the eclipse, equality, inequality, whether it is in the middle or not.)

For in all these cases it is evident that what it is and why it is are the same. What is an eclipse? A lack of light from the moon due to the earth's interposition. Why is there an eclipse? Or why is the moon eclipsed? Because the light leaves when the earth is interposed. What is a harmony? A numerical ratio between the high and the low. Why does the high harmonize with the low? Because a numerical ratio holds between the high and the low. Does the high harmonize with the low? Is there a numerical ratio between them? Having grasped that there is, [we ask] what then is the ratio?

That the inquiry is about the middle term is made clear by those cases in which the middle term is perceptible. For we inquire about it when we have not perceived it—for example, for the eclipse, we inquire about whether there is a middle term or not. But if we were on the moon, we would inquire neither about whether an eclipse comes about nor why it does; instead, these things would be clear at the same time. For from having perceived we would also come to know the universal. For the perception is that now [the earth] is interposed (for it is in fact clear that now there is an eclipse); and from this the universal would come about.

As we say, then, to know what it is is the same as to know why it is, and this either unconditionally and not regarding one of the things that belong to it, or regarding one of the things that belong to it—for example, that it has angles equal to two right angles, or it is greater or smaller.

2.3
Relations between Definitions and Demonstrations

It is clear, then, that inquiry with respect to all objects of inquiry is about a middle term. But we must now state how the what-it-is is proved, and in what way one can effect this reduction, and what a definition is, and of what, after first going through the puzzles concerning these things. Let us take as a starting-point for the arguments we are going to give the precise one that is most appropriate for those that have
90b1 preceded. For one might raise a puzzle as to whether one can know the same thing in the same respect both by a definition and by a demonstration, or whether this is impossible.

For a definition seems to be of the what-it-is, and the what-it-is in every case is universal and positive, while some deductions are privative and some are not universal—for example, those in the second figure are all privative and those in the third are not universal.

Next, not even of all the positive deductions in the first figure is there a definition—for example, that every triangle has angles equal to two right angles. The argument for this is that to have scientific knowledge of what is demonstrable is to possess the demonstration. So, since there are demonstrations of such things, it is

clear that there will not also be a definition of them. For otherwise one could have scientific knowledge through the definition without possessing the demonstration; for nothing prevents one from not having the two together.

Adequate assurance of this is to be had from induction too. For we have never yet come to know anything—neither anything belonging intrinsically nor anything belonging coincidentally—by defining it.

Further, if a definition provides knowledge of some substance, it is evident that things of this sort[67] are not substances.

It is clear, then, that there is not a definition of everything of which there is a demonstration. On the other hand,[68] is there a demonstration in every case of what there is a definition of, or not? There is one argument in this case too that is the same as before. For there is one science of one thing insofar as it is one. So, if indeed to have scientific knowledge of what is demonstrable is to possess a demonstration of it, something impossible will follow; for the one who possesses the definition of something without the demonstration will scientifically know [something demonstrable].

Further, the starting-points of demonstrations are definitions of which, as was proved previously,[69] there will not be demonstrations—either the starting-points will be demonstrable, and there will be starting-points of starting-points, and this will go on without limit, or else the primary things will be indemonstrable definitions.

But if there is not definition and demonstration of the same thing in every case, are they of the same one in some cases? Or is this impossible? For there is no demonstration of what there is a definition of. For definition is of the what-it-is, that is, of the substance; but all demonstrations, it is evident, hypothesize and assume the what-it-is—for example, mathematical demonstrations assume what a unit is and what odd is; and similarly for the other demonstrations.

Further, every demonstration proves something of something, that is, that it is or is not. But in a definition nothing is predicated of anything else—for example, neither animal of two-footed nor this of animal, nor indeed figure of plane; for plane is not figure nor is figure plane.

Further, proving what something is is different from proving that it is. A definition, then, makes clear the what-it-is, while a demonstration makes clear whether this is or is not predicated of that. And for a distinct thing there is a distinct demonstration, unless the demonstrations are related as part to whole. I mean by this that the isosceles has been proved to have angles equal to two right angles if every triangle has been proved to do so; for one is a part, the other a whole. But these things—that something is and what it is—are not related to each other in this way; for neither is part of the other.

67. I.e., things (affections) that belong intrinsically or coincidentally.
68. Reading τί δ'.
69. $72^{b}18$–25, $84^{a}29$–$^{b}2$.

It is evident, therefore, that there is not a demonstration of everything of which there is a definition, nor a definition of everything of which there is a demonstration, nor, in general, is it possible to have both of the same thing. So it is clear that definition and demonstration are not the same, nor is one included in the other; for then the underlying subjects would be similarly related.

2.4
Proving a Definition

Let us take it, then, that we have gone through these puzzles up to this point. But is there deduction and demonstration of the what-it-is, or is there not, as the argument just now hypothesized? For deduction proves something of something through a middle term. But what something is is special to it and is predicated in the what-it-is. And these terms necessarily convert. For if A is special to C, it is clear that it is also special to B and B to C, so that all are special to each other. But then if A belongs to every B in the what-it-is, and B is said universally of every C in the what-it-is, it is also necessary for A to be said of C in the what-it-is. But if one does not assume the premises by doubling in this way, it will not be necessary for A to be predicated of C in the what-it-is (if A is predicated of B in the what-it-is, but B is not in the what-it-is of everything it is predicated of). Both these premises, then,[70] will contain the what-it-is. Therefore, B too will be predicated of C in the what-it-is. If, then, both contain the what-it-is, that is, the essence, the essence will be found beforehand in the middle term. And, in general, if it is possible to prove what a human being is: Let C be human being, A the what-it-is, whether two-footed animal or some other thing. Therefore, if this is going to be deduced, it is necessary for A to be predicated of every B, and there will be a middle account other than A,[71] so that this too will be what a human being is. One assumes, then, what one ought to be proving—for B will also be what a human being is.

We must look at the issue in the case of the two premises, and the things that are primary and immediate; for then what we are saying becomes most evident. Those people, then, who try to prove through conversion what the soul is (or what a human being, or any other being, is) postulate it at the start—for example, if someone[72] were to claim that the soul is what is the cause of its own being alive, and that this is a self-moving number. For it is necessary to postulate that the soul is precisely a number that moves itself, in such a way as to be the same thing as it. For it is not the case
91b1 that if A follows B and B follows C, A will be the essence of C. Instead, it is[73] true to say only that A will be said of C—even if A is precisely some B and A is predicated of

70. Reading δὴ.
71. Reading τούτου. I.e., an account or definition of the essence.
72. E.g., Xenocrates.
73. Reading ἦν.

every B (for it is true that every case of being for a human is being for an animal, just as every human is an animal), but not in such a way that they are one thing.

If, then, one does not assume the premises in this way, one will not deduce that A is the essence of C, that is, its substance. But if you do assume them in this way, one will already have assumed beforehand what the essence of C is: B.[74] So one will not have demonstrated it; for one has assumed it at the start.

2.5
Definition and Division

But then neither does the route through divisions deduce [definitions], as was said in the analysis of the figures.[75] For it nowhere becomes necessary for the thing at issue to be the case because those things are the case, just as someone who does an induction does not demonstrate anything. For the conclusion must not be made into a question,[76] nor be the case due to being granted, but must be necessarily the case if those things are, even if the answerer denies it.

Is a human being an animal or is he inanimate? If[77] one assumed he is an animal, one has not deduced it. Next, every animal is either terrestrial or aquatic; one assumed that he is terrestrial. And that a human being is the whole—a terrestrial animal—is not necessary from what has been said, but one assumes this too. And it makes no difference whether one does this in many steps or in few; for it is the same thing. For those who proceed in this way actually make non-deductive use even of what can be deduced. For what prevents the totality of this from being true of a human being, and yet failing to make clear either the what-it-is or the essence of a human being? Further, what prevents one from adding something, subtracting something, or overlooking something in the essence?

Though these points are disregarded, it is possible to resolve the puzzles by assuming everything in the what-it-is, making the division successive by postulating what is primary, and omitting nothing. (And, this is necessary if everything falls into the division and nothing is omitted; for this is already indivisible.)[78] But nonetheless there is no deduction [of the definition] here;[79] on the contrary, if indeed it produces knowledge, it does so in another way. And this is nothing strange; for someone who does an induction, presumably, does not deduce anything either, but nonetheless makes something clear. But one who states the definition on the basis of the division does not give a deduction. For just as in the case of conclusions without middle

74. Reading τὸ B.
75. 1.31.
76. *Top*. 158ᵃ7–13.
77. Reading εἴτ'.
78. Perhaps an interpolation. 97ᵃ35–ᵇ6 explains the reasoning.
79. Reading ἔνεστι.

terms, if someone says that since these things are the case, it is necessary for this to be, it is possible to ask why, so it is too in the case of definitions by division. What is
92^a1 a human being? An animal that is mortal, footed, two-footed, wingless. Why? [one can ask] at each added posit. He will say, and prove by division (as he thinks), that everything is either mortal or immortal. But an account of this sort, taken as a whole, is not a definition, so that even if it were demonstrated by division, that certainly does
5 not make the definition into a deduction.

2.6
Other Failed Attempts to Deduce a Definition

But then is it even possible to demonstrate the what-it-is in accord with the substance, although on the basis of a hypothesis which assumes that the essence is the special composition of the things in the what-it-is, and that these alone are in the what-it-is, and that their totality is special to the thing? For this is the being for that thing. Or has one again assumed the essence in this case too? For it is necessary to
10 prove it through the middle term.

Further, just as in a deduction one does not assume what deduction is (for the premise from which the deduction proceeds is always a whole or a part[80]), so too the essence must not be present in the deduction, but must be separate from the assumptions. And one should meet the person who disputes that something has been
15 deduced by saying that "this is what a deduction is,"[81] and one should meet the person who says that the essence has not been deduced, by saying that "yes it has; for this is what we have been assuming the essence is." So it is necessary for something to be deduced without assuming what a deduction is or what an essence is.

The same holds if one wishes to prove it on the basis of a hypothesis—for example,
20 if what is being for the bad is what is being for the divisible, and if what is being for the contrary is what is being contrary to its contrary (in those cases where there is a contrary) and if the good is contrary to the bad, and the indivisible to the divisible, then what is being for the good is what is being for the indivisible. For here too one proves by assuming the essence and assumes it in order to prove the essence. "A
25 distinct one, however." Let it be so; for in demonstrations too one assumes that this is true of that; but not the same as it, nor something that has the same account as it and converts with it.

And both deductions—the one proving by division and the deduction proceeding in the foregoing way—face the same puzzle: Why will a human being be a two-footed terrestrial animal, and not an animal and terrestrial and a two-footed
30 thing?[82] For from the assumptions it is not necessary that what is predicated be one

80. 87^a22–23.
81. *Top*. 100^a25–27.
82. Retaining καὶ δίπουν.

thing; instead, it could be in the way in which the same human being is musical and knows grammar.

2.7
Proving Definitions

How, then, will a definer prove the substance or the essence? For he will not, as when demonstrating, make it clear from things agreed to be the case, that necessarily if they are the case, then something else is the case (for this is demonstration), nor will he, like someone who does an induction, make it clear—through the fact that the particulars are clear—that a totality[83] is a certain way, due to nothing being otherwise (for an induction does not prove what something is, but rather that it is or is not). And what other way remains? For of course one will not prove it by perception or by **92^{b}1** pointing one's finger.

Further, how then will one prove the what-it-is? For it is necessary for a person who knows what a human being or anything else is also to know that it is (for no one knows what the non-being is; on the contrary, one knows what the account or the name signifies when I say "goat-stag," but it is impossible to know what a goat-stag is). But then if one is to prove what something is and that it is, how will one prove them by the same argument? For the definition makes [only] one thing clear and so does the demonstration; but what a human being is and that a human being is are different things.

Next, we say that it is necessary for everything to be proved through a demonstration of what it is, unless it is its substance. But being is not the substance of anything; for being is not a kind. Therefore, there will be a demonstration that it is. And this, as things stand, is precisely what the sciences in fact do. For what a triangle signifies, this is what the geometer assumes, but that there is one, he proves. What, then, will a definer prove? What a triangle is? Therefore, knowing what a triangle is, he will not know that it is. But this is impossible.

It is also evident that in accord with the present modes of definition, definers do not prove that anything is. For even if there is something equidistant from the center, why is what has been defined that thing? And why is this a circle? For one could also say that it is mountain-copper.[84] For definitions do not make clear in addition [to the what-it-is] either that what they state is possible or that the definitions are of what they say they are of—on the contrary, it is always possible to ask "why?"

Therefore, if a definer gives a proof either of what something is or of what its name signifies, and it is never of the what-it-is, a definition will be an account that signifies the same thing as a name. But this is absurd. For, first, there will be definitions both

83. $92^{a}9$.
84. When, for example, the circle is composed of this.

of non-substances and of non-beings; for it is possible to signify even non-beings.
30 Further, all accounts will be definitions; for a name can be assigned to any account whatsoever, so that we will all talk in definitions and the *Iliad* will be a definition. Further, no demonstration would demonstrate that this name makes this thing clear; therefore, neither would definitions make this clear in addition [to the what-it-is].
35 From these considerations it appears that definition and deduction are not the same either, and that there cannot be a deduction and a definition of the same thing, and, in addition, that the definition neither demonstrates nor proves anything, and that it is not possible to know the what-it-is either by a definition or by a demonstration.

2.8
Reinvestigation of Definition and Demonstration of the What-It-Is

But we must investigate again which of these arguments is correctly stated and which
93a1 not correctly, and what definition is, and whether there can in some way be demonstration and definition of the what-it-is or in no way at all.

Since, as we said,[85] it is the same thing to know what something is and to know the cause of the fact that it is (and the argument for this is that something [A] is the
5 cause, and this cause is the thing [C] itself or something else, and if it is something else, the thing [C] is either demonstrable or indemonstrable, and further, if it is something else and it is possible to demonstrate [C]), it is necessary for the cause to be the middle term [B] and for it [C] to be proved in the first figure; for what is being proved is universal and positive.

One way, then, [of proving the what-it-is] would be that which has just now been
10 reviewed, where the[86] what-it-is is proved through another one. For in the case of the what-it-is, it is necessary for the middle term to be a what-it-is, and in the case of a special affection, for it to be a special affection. So of the essences of the same thing, we will prove the one but not the other. In this way, then, it will not be a demonstra-
15 tion, as was said earlier;[87] instead, it is a logico-linguistic deduction of the what-it-is.

Let us say, then, in what way [a demonstration of the what-it-is] is possible, discussing the issue again from the start. For just as we inquire about the why when we possess the that (although sometimes they also become clear at the same time), but it is not at all possible to know the why before the that, in the same way it is clear that we cannot know the essence of a thing without knowing that the thing is; for
20 it is impossible to know what it is when we are ignorant as to whether it is. As to whether it is, sometimes we possess this coincidentally, and sometimes by possessing something of the thing itself—for example, as regards thunder, that it is a sort of

85. 90a31–34.
86. Reading τὸ.
87. 2.4.

noise in the clouds; as regards an eclipse, that it is a sort of lack of light; as regards a human being, that he is a sort of animal; and as regards soul, that it is something that moves itself.

As regards anything, then, of which we know coincidentally that it is, it is necessary that we possess nothing at all regarding what it is; for we do not even know that it is; and to inquire about what something is without possessing that it is, is to inquire about nothing. But for the things of which we possess something, it is an easier matter. So to the extent that we possess that it is, to that extent we also possess a relation to the what-it-is.

When, then, we possess some grasp of the what-it-is, let the first case be the following. A is eclipse, C is the moon, B is the interposition of the earth. To inquire about whether the moon is eclipsed or not is to inquire about whether B is the case or not. And this is no different from inquiring about whether there is an account of it; and if there is the account, we say that the thing [B] is. (Or, of which of the contradictory pair does the account hold—of its having or not having angles equal to two right angles?)

When we have found out, we know at the same time the that and the why, if we proceed through middle terms.[88] Otherwise, we know the that but not the why. C is the moon, A is eclipse, B is not being able to cast a shadow during a full moon although there is nothing apparent between us and it. Therefore, if B (not being able to cast a shadow during a full moon although there is nothing between us and it) belongs to C, and A (being eclipsed) belongs to B, it is clear that it is eclipsed but why it is eclipsed is not yet clear; and we know that there is an eclipse but we do not know what it is.

When, on the other hand, it is clear that A belongs to C, to inquire about why it belongs is to inquire about what B is—whether interpolation or rotation or extinction of the moon. And this is the account of the other extreme—that is, A in these instances. For an eclipse is the interposition of the earth. What is thunder? Extinction of the fire in the clouds. Why does it thunder? Because fire in the clouds is extinguished. C is clouds, A is thunder, B is extinction of fire. B, then, belongs to C (clouds), for the fire is extinguished in them; and A (the noise) belongs to B; and B is indeed the account of A, the first extreme term. And if there is another middle term for this, it will come from the accounts that have been left aside.

In what way, therefore, the what-it-is is grasped and becomes known has been stated, with the result that no deduction and no demonstration of the what-it-is comes about. However, it is made clear through deduction and through demonstration, with the result that it is neither possible to know the what-it-is without a demonstration, where the cause is something else, nor is there a demonstration of it, as we said in going through the puzzles.[89]

88. Reading διὰ μέσων.
89. 2.2–3.

2.9
Making Clear What Something Is through Demonstration

For some things the cause is something else, of others it is not. So it is clear that in some cases the what-it-is is immediate and a starting-point, and for these one must hypothesize both that they are and what they are, or make this evident in some other way (this is precisely what the arithmetician does; for he hypothesizes both what a unit is and that it is). But for things that have a middle term and for which something else is the cause of their substance, it is possible, as we have said,[90] to make these clear through a demonstration, without demonstrating the what-it-is.

2.10
The Different Sorts of Definition

Since a definition is said to be an account of the what-it-is, it is evident that one sort will be an account of what a name, or some other name-like account, signifies—for example, what "triangle" signifies. When we possess that precisely this thing is, we inquire about why it is. But it is difficult to get hold of things in this way when we do not know that they are. The cause of the difficulty was stated earlier,[91] that we do not even know that they are, except coincidentally. (An account is one in two ways: either by conjunction as the *Iliad* [might be], or by indicating one thing said not coincidentally of one thing.)

One definition, then, of definition is the one just stated, but another is that a definition is an account that makes clear why the thing is. So the former one signifies but **94a1** does not prove, while it is evident that the latter will be like a demonstration of the what-it-is, differing from a demonstration in arrangement. For there is a difference between saying why it thunders and what thunder is. For in the first case one says "because the fire in the clouds is extinguished." But what is thunder? "The noise of fire in the clouds being extinguished." So the same account is said in another way, and in one way it is a continuous demonstration, while in the other way it is a definition.

(The definition of thunder is also "noise in the clouds"; this is the conclusion of the demonstration of its what-it-is.)

The definition of immediate things is the indemonstrable positing of their what-it-is.

Therefore, one sort of definition is an indemonstrable account of the what-it-is; another is a deduction of the what-it-is, differing in inflection from a demonstration; a third is the conclusion of a demonstration of the what-it is.

90. 2.8.
91. 93a24–27.

It is evident, then, from what has been said in what way there is demonstration of the what-it-is and in what way there is not, and of what sorts of things there is one, and of what sorts there is not; and further, in how many ways something is said to be a definition, and in what way it proves the what-it-is and in what way not, and of what sorts of things it does and of what sorts it does not; and further, how it is related to demonstration, and in what way it is possible for there to be demonstration and definition of the same thing and in what way it is not possible.

2.11
The Four Causes as Middle Terms

Since we think we have scientific knowledge of something when we know the cause, and there are four causes (one, the essence; one,[92] what, if certain things hold, it is necessary for it to hold; another, what first produced the movement; the fourth, the for-the-sake-of-which), all of them are proved through the middle term.

For "what, if this thing holds, it is necessary for it to hold" comes about not when one premise is assumed, but when at least two are; and this is so when they have one middle term. So when this one thing is assumed, it is necessary for the conclusion to hold. This is also clear from the following. Why is the angle in a semicircle a right angle? What has to hold for it to be a right angle? Let A be right angle, B half of two right angles, C the angle in the semicircle. Of A (right angle) belonging to C (the angle in the semicircle), then, the cause is B. For B is equal to A and C to B (for it is half of two right angles). If, then, B (which is the half of two right angles) holds, A belongs to C (and this, we said, is for the angle in the semicircle to be a right angle). And this [B] is the same as the essence [of C], in that this is what its account signifies. But then it has also been proved that the middle term is the cause of the[93] essence.

Why did the Persian war with the Athenians come about? What is the cause of the war made against the Athenians? Because they attacked Sardis with the Eretrians; for this first produced the movement. A is war, B is being first to attack, C is the Athenians. B belongs to C (being first to attack belongs to the Athenians), and A belongs to B (for people make war on those who first do them injustice). Therefore, A belongs to B (having war made against them belongs to those who started it in the first place), and this—B—belongs to the Athenians; for they started it first. Therefore, here too the cause—what first produced the movement—is the middle term.

Cases where the for-the-sake-of-which is the cause: For example, why is he taking a walk? In order to be healthy. Why is there a house? In order to preserve the equipment. In the former case for the sake of being healthy, in the latter for the sake of preservation. Why must one take a walk after dinner, and for the sake of what must

92. I.e., the material cause (*Ph.* 195ª15–18, *PA* 677ª18, *Met.* 1013ª5).
93. Reading τοῦ and rejecting <ὄν>.

one do so?—there is no difference. C is taking a walk after dinner, B is food not coming to the surface, A is being healthy. Let it be the case, then, that taking a walk after dinner makes food not come to the surface at the mouth of the stomach, and let this be healthy. For it seems that B (the food's not coming to the surface) belongs to C (taking a walk), and A (being healthy) to B. What, then, is the cause of A—the for-the-sake-of-which—belonging to C? It is B, [the food's] not coming to the surface. And this is, as it were, an account of A; for A will be accounted for in this way. Why does B belong to C? Because being in this state [B] is what being healthy is. (One must exchange the accounts, and in this way each will become more evident.)

Here the events are in the reverse order compared to causes in terms of movement. For there the middle term must come about first, while here C, the extreme, must come about first, although the final thing [to occur] is the for-the-sake-of-which.

But it is possible for the same thing to be both for the sake of something and of necessity—for example, light passing through a lantern. For finer-grained things pass through larger ducts of necessity (if indeed light is produced by passing through) and also for the sake of something (in order that we not stumble about). If it is possible, then, for a thing to be [both for the sake of something and of necessity], is it also possible for a thing to come to be [both for the sake of something and of necessity]? For example, if it thunders both because when fire is extinguished it is necessary for it to sizzle and make a noise, and, as the Pythagoreans say, it is for the sake of threatening the dead in Tartarus in order to make them afraid. There are very many things of this sort, and especially among the things that are composed and produced in accord with nature; for one nature produces them for sake of something, while another does so of necessity. But necessity is twofold; for one is in accord with nature and impulse, while the other is by force or contrary to impulse—as a stone of necessity travels both upward and downward, but not because of the same necessity.

But among the products of thought, some never start up spontaneously—for example, a house or a statue—nor of necessity either, but rather for the sake of something, while others are also due to luck—for example, health and safety. It is most of all among things that admit of being one way or another—when, not due to luck, their coming about is such that the end is good—that they come about for the sake of something, either by nature or by craft. But nothing that is due to luck comes about for the sake of something.

2.12
Causes and Effects

The cause for things that are coming to be, things that have come to be, and things that will be is precisely the same as the one for things that are (for the middle term is the cause)—except that for things that are the case, the cause is [present], for things that have come to be, it has come to be, and for things that will be, it will be. For example,

why has an eclipse come to be? Because the earth has gotten in between. And it is coming to be because the earth is getting in between, and it will be because the earth will be in between, and is doing so because it is there. What is ice? Let it be assumed, then, that it is frozen water. C is water, A is frozen, B (the cause, the middle term) is the complete absence of heat. B, then, belongs to C and A (being frozen) belongs to B. Ice is coming to be when B is coming to be, has come to be when B has come to be, and will be when B will be. Now, what is a cause in this way and what it is the cause of come to be at the same time, whenever they come to be, and when they are, they are at the same time; and the same holds in the case of what has come to be and what will be.

But in the case of things in which [a cause and what it is the cause of] do not come to be at the same time, is it possible, as it seems to us, for one to be the cause of the other in a continuous time? That the cause of this having come to be is that another thing has come to be? That the cause of something's going to be is that something else will be? And of something's coming to be whether something came to be earlier? The deduction, of course, proceeds from what has come to be later (although in these cases too it is things that have [already] come to be that are the starting-point); which is why it is the same way with what is coming to be. It does not proceed from what is earlier—for example, since this has come to be, this came to be later.

And in the case of what will be it is the same way. For in neither an indeterminate nor a determinate time will it be the case that since it is true to say that this has come to be, it is true to say that this later thing has come to be. For in the interval it will be false to say the latter thing, when the former has already come to be. And the same account applies to what will be: since this has come to be, this will be. For the middle term must be of the same descent: for what came to be, it must be something that came to be; for what will be, something that will be; for what is coming to be, something that is coming to be; and for something that is, something that is. But nothing can be of the same descent as both what has come to be and what will be. Further, it is not possible, either, for the intervening time to be neither indeterminate nor determinate; for it will be false to say [that latter thing] in the interval.

But it is necessary to investigate what the connection is that is such that, after the having come to be, the coming to be happens in things. Or is it clear that what is coming to be is not contiguous to what has come to be? For neither is what came to be contiguous to what came to be; for these things are limits and indivisible. Just as, then, points are not contiguous to one another, neither are things that came to be; for both are indivisible. Due to the same thing, then, what is coming to be is not contiguous to what has come to be. For what is coming to be is divisible, while what has come to be is indivisible. Just as, then, a line stands to a point, so what is coming to be stands to what has come to be; for unlimitedly many things that have come to be are present in what is coming to be. (But this must be discussed more clearly in the universal accounts concerning movement.[94])

94. *Ph*. Book 6.

Where things come to be consecutively, then, let this much be assumed about how the middle term is the cause. For here too[95] it is necessary for the middle term and the first term to be immediate. For example, A has come to be since C has come to be (C has come to be later, A earlier; but C is the starting-point because it is nearer to the now, which is the starting-point of time). And C has come to be if D has come to be. If, then, D has come to be, it is necessary for A to have come to be. And C is the cause; for if D has come to be, it is necessary for C to have come to be, and if C has come to be, it is necessary for A to have come to be earlier.

When one takes the middle term in this way, will [the process] come to a stop somewhere at an immediate, or will a middle term always be inserted because of the unlimitedness? For what has come to be is not contiguous to what has come to be, as was said.[96] But it is surely necessary to start, nonetheless, from something that is immediate and first from the present now.

And it is the same in the case of what will be. For if it is true to say that D will be, it is necessary for it to have been earlier true to say that A will be. And the cause of this is C; for if D will be, C will be earlier, and if C will be, A will be earlier. And here too the division will be unlimited in the same way; for things that will be are not contiguous to each other. But here too an immediate starting-point must be assumed.

It is the same way in the case of works [of craft]. If a house has come to be, it is necessary for stones to have been cut and to have been produced. Why? Because the foundation must have come to be if indeed the house has come to be; and if the foundation has come to be, stones must have come to be earlier. Again, if there will be a house, in the same way there will be stones earlier. And it is proved through the middle term in the same way; for there will be a foundation earlier.

But since we see in what comes to be a sort of circular coming to be, it is possible for this to be, if indeed the middle term and the extremes follow each other; for in these cases there is conversion (this was proved in the first accounts[97]), because the
96ᵃ1 conclusions convert; for this is what being circular is. In the case of works [of nature] it appears this way: if the earth has been soaked, it is necessary for vapor to come to be; if vapor came to be, cloud did; if cloud came to be, water did; and if water came to be, it is necessary for the earth to have been soaked; but this was the starting-point, so that it has come around in a circle; for if any one of these holds, another does, and if that one, another, and if that one, the first one.

There are some things that come to be universally (for they either are or come to be in the same way always and in every case), while others do so not always but for the most part—for example, not every male human being gets a beard, but for the most part they do. In such cases, then, it is also necessary for the middle term to hold for the most part. For if A is predicated universally of B and B universally of C, it is also

95. I.e., as in other scientific deductions.
96. 95ᵇ4.
97. 73ᵃ6–20, *APr.* 2.3–5.

necessary for A to be predicated of C always and in every case (for this is what it is to be universal—to hold in every case and always). But it was hypothesized to hold for the most part. Therefore, it is necessary for the middle term, B, also to hold for the most part. Therefore, for things too that hold for the most part there will be immediate starting-points that hold or come to be in the way they do for the most part.

2.13
Division and Definitions

How, then, the what-it-is is given in the terms [of a deduction], and in what way there is and is not a demonstration and a definition of it, has been stated earlier.[98] Let us now say how one must hunt down the things that are predicated in the what-it-is.

Among the things, then, that always belong to each thing, some belong more widely than it, yet do not extend outside the kind. I say that they "belong more widely" if, though they belong to each thing universally, nonetheless they also belong to something else. For example, there are things that belong to every triad but also to non-triads, as being belongs to a triad, but also to what is not a number; but odd too belongs to every triad and belongs more widely (for it also belongs to a pentad), but it does not extend outside the kind; for a pentad is a number, and nothing outside numbers is odd. Things of this sort, then, one must take up to the point where for the first time each one taken belongs more widely, but all of them together do not belong more widely; for it is necessary for this to be the substance of the thing. For example, number belongs to every triad, and so do odd and prime in both ways (both as not being measured by a number and as not being composed of numbers[99]). This, already, is in fact what a triad is: a number that is odd, prime, and prime in this way. For, in the case of each of these, it holds that some also belong to all odd numbers, the last belongs to a dyad too, but all of them together belong to nothing [except a triad].

Since we have made clear above[100] that whatever [affections] are predicated in the what-it-is are necessary[101] (and what is universal is necessary), and in the case of a triad—and of anything else [whose affections] are taken in this way—what is taken is in the what-it-is, these [affections] will of necessity constitute a triad. **96^{b}1**

And that they are its substance is clear from the following. For if this were not the essence of a triad, it would be necessary for it to be, as it were, a sort of kind, either named or nameless. Therefore, it will belong more widely than to the triad. (For let it be hypothesized that a kind is the sort of thing that potentially belongs more widely.) Therefore, if it belongs to nothing other than the indivisible triads, this would be the

98. 2.8–9.
99. One is not a number (*Met.* $1088^{a}6$–8) so if p is prime, there are no numbers n_1 and n_2 such that $p = n_1 + n_2$ or $p = n_1 \times n_2$.
100. $73^{a}34$–37, $^{b}25$–28.
101. Reading ἀναγκαῖα.

being for a triad. (For let it also be hypothesized that the substance of each thing is the last predication of this sort to apply to what is indivisible.) So, in the same way too, for anything else whatsoever, the things proved in this way will be the being for it.

When one is dealing with some whole, one must divide the kind into what is indivisible in form, the primary things—for example, number into triad and dyad. Then one must try to get definitions of these—for example, of straight line, circle, and right angle. And after this, having got what the kind is (for example, qualities or quantities), one must get a theoretical grasp on the special affections through the common primary things. For the coincidents of the things composed of the indivisibles will be clear from the definitions, because the definition and what is simple are the starting-points of all things, and the coincidents belong intrinsically to the simples alone, and they belong to other things in virtue of the simples.

Also, divisions in accord with differences are useful in following this route. In fact, in what way they prove things was stated earlier.[102] But only in the following way will they be useful for deducing the what-it-is.

And yet they might seem, at any rate, to be of no use at all but rather to assume everything from the outset, just as if one had initially assumed things without division. But it makes a difference which of the predicates are predicated first and which later—for example, whether one says "animal tame two-footed" or "two-footed animal tame." For if everything is composed of two things, and if "animal tame" is one thing, and if in turn from this and the difference human being [is composed], or whatever else the one thing turns out to be, it is necessary to postulate having first made the division [correctly].

Further, with a view to omitting nothing in the what-it-is, this is the only possible way to proceed. For when the primary kind has been taken, if one takes one of the lower divisions, not everything will fall under it—for example, not every animal is whole-winged or split-winged, but every winged one is; for it is of this [kind] that this is a difference. And the first difference of animal is that into which every animal falls; and similarly for each of the others, both the kinds outside it and the ones that fall under it—for example, [the first difference of bird is] that into which every bird falls, and of fish that into which every fish does. If one proceeds in this way it is possible to know that nothing has been omitted; otherwise, one will necessarily both omit something and not know it.

But there is no need for the one who is defining and dividing to know everything there is. And yet there are some[103] who say that it is impossible to know what each thing's differences are without knowing that thing, and that without the differences one cannot know each thing; for what it does not differ from it is the same as, and what it does differ from it is distinct from.

102. 2.5, *APr.* 1.31.
103. E.g., Speusippus.

First, then, this is false; for one thing is not distinct from another with respect to every difference; for there are many differences between things in the same form, although not differences with respect to their substance or what they are intrinsically.

Next, when one takes the opposites (that is, the difference) and assumes that everything falls in one or the other, and that what is being inquired about is in one of the two, and one knows this one, it makes no difference whether one knows or does not know the other things of which the differences are predicated. For it is evident that if by proceeding in this way one reaches things that have no further differences, one will have the account of the thing's substance. And that everything falls in the division, if they are opposites that do not have an intermediate, is not a postulate; for it is necessary for everything to be in one of the two, if indeed it is to be[104] a difference of that thing.

To establish a definition through divisions one must aim for three things: one must take the things predicated in the what-it-is, order these as first or second, and ensure that these are all of them.

It is possible to achieve the first of these by being able to establish things through the kind, just as for a coincident by deducing that it belongs.

One will order things as one should if one takes the first term. And one will do this if one takes the term that follows all the others, while not all others follow it; for it is necessary for there to be some such term. Once this is taken, it is the same way now in the case of the lower ones; for the second term will be the first of the others, and the third will be the first of the next ones; for if the highest term is removed, the next will be the first of the others. And similarly in the other cases too.

That these are all the terms is evident from the fact that one takes as the first term in the division that every animal is either this or that, and that this in fact belongs; again one takes the difference of this whole thing; and of the ultimate one there is no further difference—or rather, what is immediately after the ultimate one no longer differs in form from the compound. For it is clear that neither has anything extra been added (for all the terms taken are in the what-it-is), nor has anything been omitted; for it would have to be a kind or a difference. But the kind is the first term, and this was taken together with the differences; and the differences are all grasped; for there is no further later one; for in that case the ultimate one would differ in form, while it was said not to differ.

One must inquire by looking at things that are similar, that is, undifferentiated, and, first, at what they all have that is the same, then one must do this again for the others: those that are the same in kind as the first group and the same in form as each other but distinct in form from the first group. And when, in the case of these, one has got something that is the same in all of them, one must do likewise in the case of the other group, again looking to see in the case of the things taken whether there is something that is the same, until one arrives at a single account; for this will be the

104. Reading ἔσται.

definition of the thing. But if one does not get to one account but to two or more, it is clear that what one is inquiring about is not one thing but several.

I mean, for example, that if we were inquiring about what greatness of soul is, we must look in the case of some great-souled people whom we know to see what one thing they, as such, all have in common. For example, if Alcibiades,[105] Achilles, and Ajax are great-souled, what one thing do they all have in common? They could not endure being treated with wanton aggression; for one made war, one became enraged, and one killed himself. Again, take others—for example, Lysander and[106] Socrates. If in this case it is indifference to good luck or bad luck, taking these two things, I look to see what the same thing is that indifference to luck and not to endure dishonor have in common. And if it is nothing, there will be two forms of greatness of soul.

Every definition is always universal; for the doctor does not say what is healthy for some particular eye, but rather for every eye, or else for some determinate form of eye.

But it is easier to define the particular than the universal, which is why one must proceed from particulars to universals; for in fact homonymies more often escape notice in the case of universals than with undifferentiated things.

And just as in demonstrations something must have been deduced, so too in definitions there must be perspicuousness. And this will be the case if, through the particulars that one has mentioned,[107] one gives a separate definition for each kind—for example, if one defines similarity not for every case but for colors, and for shapes, and sharpness for sound, and in this way proceeds to what is common, being careful not to fall into homonymy.

If one must not argue dialectically by means of metaphors, it is clear too that one must neither define things by means of metaphors nor define what is said by means of metaphors; for then one will necessarily be arguing dialectically by means of metaphors.

2.14
Division and Problems

98ᵃ1 With a view to getting a grasp on problems one must select from the dissections and the divisions,[108] and do the selecting in this way: having posited the kind that is common to all—for example, if animals are what one is getting a theoretical grasp on, one must select whatever belongs to every animal; and once these are taken, one must next select whatever follows every member of the first of the remaining terms—for

105. Reading καὶ.
106. Reading καὶ.
107. Reading εἰρημένων.
108. The reference may be to Aristotle's *Dissections* and *Divisions*, or to some more strictly logical procedures.

example, if this is bird, whatever follows every bird; and in this way one must always select whatever follows the next nearest term; for it is clear that one will now be in a position to say why whatever follows the things falling under the common kind belongs to them—for example, why they belong to a human being or to a horse. Let A be animal, B whatever follows every animal, and C, D, and E animals of certain sorts. It is clear, then, why B belongs to D; for it does so because of A. It is the same way in the case of the others. And the same account always applies to the ones lower down.

At present we are speaking in terms of the common names that have been handed down to us, but we must investigate not only these, but also anything else that may have been seen to belong in common, taking it separately and seeing what it follows and what follows it—for example, both having a third stomach and not having incisor teeth in both jaws follow having horns. Next, see what things having horns follows. For it is clear why what was mentioned will belong to these: for it will belong because they have horns.

Further, another way is to select by analogy. For it is impossible to come up with one identical thing that cuttlefish bone, fish-spine, and animal bone should be called; but there will be things that follow these too, just as if there were some single nature of this sort.

2.15
Problems with the Same Middle Terms

Some problems are the same by having the same middle term—for example, because all are cases of reciprocal replacement. Among these, some are the same in kind, namely, those that have differences in that they belong to different things or in different ways—for example, why does it echo? or why is it seen in a mirror? or why is there a rainbow? For all these are the same problem in kind (for they are all cases of reflection), but they are distinct in form.

Other problems differ in that the middle term of one falls under the middle term of the other—for example, why does the Nile flow more abundantly at the end of the month? Because the end of the month is stormier. And why is the end of the month stormier? Because the moon is waning. These things are related to each other in this way.

2.16
Relations between Causes and Effects

As regards the cause and what it is the cause of, one might be puzzled as to whether when what is caused is present the cause is also present. As, for instance, if a [plant]

sheds leaves or [the moon] is eclipsed, will the cause of its being eclipsed or of its shedding leaves also be present—for example, if the cause is being broad-leaved, or in
98b1 the case of the eclipse, the earth's being in between? For if it is not present, something else will be the cause of these things, and if the cause is present, what it causes is also present at the same time (for example, if the earth is in between, the moon is eclipsed, or if a plant is broad-leaved, it sheds leaves). And if it is this way, they will be present
5 at the same time and will be proved through each other. For let A be sheds leaves, B broad-leaved, and C vine. If, then, A belongs to B (for everything broad-leaved sheds leaves), and B belongs to C (for every vine is broad-leaved), then A belongs to C,
10 that is, every vine sheds leaves. The cause is B, the middle term. But it is also possible to demonstrate that the vine is broad-leaved through its shedding leaves. Let D be broad-leaved, E sheds leaves, and F vine. Then E belongs to F (for every vine sheds
15 leaves) and D to E (for everything that sheds leaves is broad-leaved). Thus, every vine is broad-leaved. And the cause is its shedding leaves.

But if it is not possible for things to be causes of each other—for the cause is prior to what it is the cause of, and the earth's being in between is the cause of the eclipse, but the eclipse is not the cause of the earth's being in between—if, then, the demonstration through the cause is the demonstration of the why, and the
20 one not through the cause is the demonstration of the that, one knows that it is in between but not why it is. But it is evident that the eclipse is not the cause of the earth's being in between, but rather the latter is the cause of the eclipse; for the earth's being in between is present in the account of the eclipse, so that it is clear that it is through the former that the latter is known, and not the former through the latter.

Or is it possible for there to be several causes of one thing? For if in fact it is
25 possible for the same thing to be predicated in the primary way[109] of more than one thing; let A belong to B in the primary way, and also to C, in another primary way, and let these belong to D and E. Therefore, A will belong to D and E, and the cause of its belonging to D will be B, and that of its belonging to E will be C. So, when the cause is present, it is necessary for the thing at issue to be present, but when the thing
30 is present it is not necessary for everything that is a cause to be present—something that is a cause, yes, but nonetheless not everything that is one.

Or if a problem is always universal and the cause is some totality, is what it is a cause of also a universal? For example, shedding leaves is defined for some totality, even one that has forms, and it belongs to these things universally—either to plants or to plants of a certain sort. So, in these cases, both the middle term and what it is
35 the cause of must be equal [in extension] and must convert. For example, why do trees shed leaves? If it is because of the solidification of their liquid, then, if a tree sheds leaves, solidification must be present, and if solidification is present, not in anything whatever but in a tree, shedding leaves is present.

109. 79a38.

2.17
Can One Thing Have Several Causes?

Is it possible that the same thing is not a cause of the same thing in all cases, but **99ª1**
a distinct one, or is that not possible? Surely, if something has been demonstrated intrinsically and not in virtue of a sign or coincidentally, it is not possible; for the middle term is the account of the extreme. But if it has not been demonstrated in this way, it is possible. And it is possible to investigate coincidentally both what it is a cause of and for what (though such things do not seem to be problems). 5

Otherwise, the middle term will have a similar status [to the other terms]: if they are homonymous, the middle term will be homonymous; if they are in the same kind, it will be so too. For example, why do proportionals alternate? For the causes in the case of numbers and in the case of lines are distinct—and also the same: insofar as they are lines, distinct, but insofar as admitting of a certain sort of increase,[110] the same. And it is this way in all cases. But of a color's being similar to a color or a figure 10
to a figure, the causes are distinct in the two cases. For similarity is homonymous in their case; for in the latter case it is presumably having proportional sides and equal angles, but in the case of colors it is that the perception of them is one, or something else of this sort. As for things that are the same by analogy, they will have middle 15
terms that are also the same by analogy.

The cause, what it is the cause of, and for what thing it is a cause are related to each other in the following way. If one takes them individually, what the cause is of extends more widely—for example, having exterior angles equal to four right angles extends more widely than triangle or square, but if one takes them all together, it extends equally (for they are all things that have exterior angles equal to four right 20
angles). And similarly for the middle term. And the middle term is the account of the first extreme, which is why all the sciences come about through definition. For example, shedding leaves both follows vine and has a wider extension, and follows fig and has a wider extension; but it does not have a wider extension than all of them together, but rather an equal one. If indeed one takes the primary middle term, it is an account of shedding leaves. For there will be a primary middle term in both cases 25
(that they are all of this sort); and then a middle term for this (that the sap solidifies, or something else of this sort). What is it then to shed leaves? For the sap to solidify at the junction of the seed.

In schematic terms, one who is inquiring about the relation between the cause and what it is the cause of will give an account this way. Let A belong to every B 30
and B to each of the Ds, but more widely. Then B would belong universally to the Ds (for I call "universal" a term with which they do not convert; and I call "primary universal" a term that taken separately they do not convert with, but that taken all together they convert with and are coextensive with). B, then, is the cause of A for 35

110. I.e., quantitative increase.

the Ds. Therefore, A must extend more widely than B; otherwise, why will B be the cause rather than A?

If, then, A belongs to every E, all of them together will be some one thing distinct from B. For otherwise how will it be possible to say that A belongs to everything that
99b1 E does, but E does not belong to everything that A does? For why will there not be a cause [for A belonging to every E] as there is for A[111] belonging to every D? (But will the Es in fact be one thing? One must investigate this, and let it be C.)

It is possible, then, for there to be several causes of the same thing, but not for
5 things of the same form—for example, the cause of longevity for four-footed animals is their not having bile, while for birds it is their being dry, or some other thing.

2.18
The True Cause Is the Closest One to the Thing

If one does not arrive straightaway at what is indivisible and there is not just one middle term but several, the causes are several too. But which of the middle terms is the cause of the particulars? The one that is primary in the direction of the universal
10 or the one that is so in the direction of the particulars? It is clear indeed that it is the one closest to what it is the cause of. For it is a cause because the primary term falls under the universal—for example, C is the cause for D of B's belonging to it. C, then, is the cause for D of A's belonging to it, but B is the cause for C of A's belonging to it, and for itself of A's belonging to it.

2.19
How We Get a Grasp on Scientific Starting-Points

15 As for deduction and demonstration, what each of them is and how they come about is evident; and at the same time that goes for demonstrative scientific knowledge too, for it is the same thing. But as for the starting-points, how they come to be known and what the state is that knows them will be clear once we have first gone through the puzzles.

We stated earlier[112] that it is not possible to have scientific knowledge through
20 demonstration if one does not know the primary and immediate starting-points. But one might raise some puzzles about knowledge of the immediates, whether it is the same or not the same [as scientific knowledge], and whether there is scientific knowledge of both [non-immediates and immediates] or not,[113] or rather scientific knowledge of one and some other kind of knowledge of the other, and also whether

111. Rejecting the seclusion of A.
112. 72a25–72b4.
113. Reading ἢ οὔ.

the states are not [already] present in us but arise in us, or rather are [already] present in us without our noticing them.

If we possess them, certainly, the situation is absurd; for it follows that we do have bits of knowledge that are more exact than demonstrations without our noticing them. But if we acquire them without possessing them earlier, how can we come to know and to learn them from a not pre-existing knowledge? For this is impossible, as was also said in connection with demonstration.[114] It is evident, therefore, that neither can we possess these states nor can they arise in us when we are ignorant and possess no such state at all.

Therefore, we must possess some sort of capacity, but not one that will be more estimable than these states with respect to exactness. And it is evident that this is indeed the case for all animals. For they have an innate capacity of discernment, which we call "perception." And when a perception is present, in the case of certain animals a persistence of the perceptual affection comes about, while in others it does not. In those animals, then, in which it does not come about, there is no knowledge outside perception, either none at all or none concerning the things about which this persistence does not come about. But in those in which it is present, it is possible, after having perceived, to still possess the perceptual object in their souls. And after many such occurrences, a certain difference then comes about, so that in some animals an account comes about from the persistence of these things, while in others it does not.

From perception, then, comes memory, as we say, and from memory of the same thing when it occurs many times, experience; for memories that are many in number constitute a single experience. And from experience, or from the entire universal having come to rest in the soul, the one beyond the many (this being whatever is present as one and the same in all of them), comes a starting-point of craft knowledge and scientific knowledge—of craft knowledge if it concerns coming to be, of scientific knowledge if it concerns being. These states, then, are neither present in us as determinate ones nor arise in us from other states that are closer to knowledge, but instead come from perception, as in a battle, when a rout occurs, first one man makes a stand, then another does, and then another, until a starting-point[115] has been reached. And, in fact, the soul is the sort of thing that is capable of undergoing this.

But let us say again what was said just now, but not said perspicuously. For when one of the undifferentiated things makes a stand, there is a first universal in the soul (for although one perceives the particular, perception is of the universal—for example, of human being, but not of Callias the human being). Again, on these [universals] a stand is made, until what is without parts and is universal makes a stand—for example, such-and-such sort of animal makes a stand until animal does. And on this a stand is made in the same way. It is clear, then, that it is necessary for

114. 71^a1–11.

115. I.e., when enough men make the stand needed to turn the tide of battle, the rout starts.

us to know the primary things by induction; for in fact this is the way perception produces the universal in us.

But since among the states of thought by which we grasp the truth, some are always true, while others admit of falsehood (for example, belief and rational calculation do, while scientific knowledge and understanding are always true), and no kind [of state of thought] other than understanding is more exact than scientific knowledge, and since the starting-points are better known than demonstrations, and all scientific knowledge involves an account, there will not be scientific knowledge of the starting-points. And since nothing except understanding can be truer than scientific knowledge, understanding will be of the starting-points. This emerges from our investigation of these things and also because demonstration is not a starting-point of demonstration, and so scientific knowledge is not a starting-point of scientific knowledge either. If, then, apart from scientific knowledge we have no true kind [of state of thought] other [than understanding], it will be understanding that is the starting-point of scientific knowledge. And the starting-point will be related to the starting-point[116] as the entire [branch of] scientific knowledge is related to the entire thing [it deals with].[117]

116. I.e., understanding will be related to the starting-point of the scientific knowledge in question.

117. 96ᵃ8–19.

TOPICS*

BOOK 1

1.1
Aim of the Study

The proposed aim of this study is to find a methodical inquiry by which we will be capable of constructing deductions on any problem[1] that is proposed, proceeding from acceptable beliefs, and, when submitting to argument ourselves, of avoiding saying anything contradictory. First, then, we must say what a deduction is, and what its different varieties are, in order to grasp what a dialectical deduction is; for this is what we are inquiring about in the proposed study.

A deduction, then, is an argument in which, certain things being posited, something distinct from the things proposed follows of necessity because of the things proposed. It is a demonstration when the deduction proceeds from things that are true and primary, or are such that our knowledge of them has a starting-point in things that are primary and true, and a deduction is dialectical when it deduces from acceptable beliefs.

The things that are true and primary are those that are persuasive not because of other things but because of themselves (for in the case of scientific starting-points we must not further inquire about why they are so, instead each of the starting-points must be intrinsically persuasive). Acceptable beliefs, by contrast, are things that seem so to everyone, to the majority, or to the wise—either to all of them, or to most, or to the best known and most reputable.

A contentious deduction is one that proceeds from what appear to be, but are not, acceptable beliefs, or an apparent deduction from what are, or what appear to be, acceptable beliefs; for not everything that appears to be an acceptable belief actually is one. For none of the things said to be acceptable beliefs wears this appearance entirely on its face, which is what actually occurs in the case of the starting-points of contentious arguments;[2] for in their case the nature of their falsity is for the most part immediately clear to those capable of seeing even small things. Let us say, then, that

* Translated by C. D. C. Reeve. Text: J. Brunschwig, *Aristote Topiques Livres I–IV, Livres V–VIII* (Paris, 1967, 2007). The title—*Topikôn*—probably derives from the use of places (*topoi*) as mnemonic devices. See 163^{b}22–33.

1. Retaining προβλήματος. See 104^{b}1–17.

2. *SE* 171^{b}29–33.

101ᵃ1 the first sort we mentioned is a contentious deduction and a [genuine] deduction, while the other sort is a contentious deduction, but not a [genuine] deduction, since it appears to deduce, but does not deduce.

Further, beyond all the sorts of deductions just mentioned, there are the fallacies[3] that proceed from things proper to a given science, as happens in the case of geometry and other sciences akin to it. For this mode of argument would seem to be different from the sorts of deductions we mentioned; for someone who draws false diagrams[4] does not deduce from true and primary things, nor from acceptable beliefs either. For they do not fall within the definition; for he does not take [as his starting-points] things that seem so to all, to the majority, or to the wise (whether all of them, or most, or the most reputable); rather, he produces his deduction from premises proper to the science but not true—for example, he produces his fallacy either by defining the semicircles in a way that he should not, or by drawing certain lines in a way in which they should not be drawn.

The foregoing, then, may be taken as an outline of the forms of deductions there are. And as a universal remark both about all the things mentioned and about those we will discuss later, we may say that this will be the extent of our determinations. This is because of our deliberately choosing not to give an exact account of any of these things; rather, our wish is to give an outline of them, since we consider it fully adequate, for the purposes of the proposed methodical inquiry, to be able to know each of them in some way or other.

1.2
Usefulness of the Study

Our next task, after what we have said, is to say how many areas, and also of what sorts, our study is useful in. It is useful, then, in three: in training, in argumentative encounters, and in the philosophical sciences.

That it is useful in training is immediately evident; for if we have a methodical inquiry we will more easily be able to argue dialectically about whatever is proposed. It is useful in argumentative encounters because, once we have cataloged the beliefs of ordinary people, we will engage in conversation with them, not by proceeding from the beliefs of others, but from their own, changing their minds about anything they appear to us to be stating incorrectly. And it is useful in the philosophical sciences because the capacity to go through the puzzles on both sides of a question will make it easier to judge what is true and what is false in each.

Further, dialectic is useful as regards the primary [starting-points] in each science. For it is impossible to say anything about these based on the starting-points proper

3. *SE* 171ᵇ11–22, 171ᵇ34–172ᵃ11.
4. *SE* 171ᵇ12–16.

to the science in question, since these starting-points are prior to everything else; instead, these must be discussed through the acceptable beliefs about each of them. And this is a task that is special to, or, at any rate, characteristic of, dialectic, which, **$101^{b}1$** because of its capacity to stand outside and examine, provides a route toward the starting-points of all methodical inquiries.

1.3
What It Is to Possess the Methodical Inquiry

We will possess the methodical inquiry completely when we possess it as we do in the case of rhetoric, medicine, or other capacities of this sort. For the rhetorically competent person will not try to persuade, nor will the doctor try to cure, on the basis of every mode [of persuasion or of treatment], but if he omits none of the possible ones, we say that he possesses the science adequately.

1.4
What the Methodical Inquiry Is Based On

First, then, we must get a theoretical grasp on the things on which the methodical inquiry is based. If, then, we could grasp how many and what sorts of things arguments are related to, and on what they are based, and how to become well equipped with these, we would have an adequate grasp on what we proposed.[5]

The things arguments are based on are equal in number to, and the same as, the things that the deductions are concerned with. For arguments are from premises, while the things that the deductions are concerned with are problems. And every premise, as well as every problem, indicates either a kind, a special thing, or a coincident; for in fact the difference, since it is of the kind, must actually be classified together with the kind. But since of what is special one part signifies the essence and another part does not signify it, let us divide what is special into both of the parts just stated, and let us call the part that signifies the essence a "definition," while the remaining part, in keeping with the name commonly assigned to them, may be called a "special affection." It is clear, then, from what has been said that, according to the present division, it turns out that there are four in all: special affection, definition, kind, and coincident. But let no one suppose us to be saying that each of these stated by itself is a premise or a problem, but rather it is from these that problems and premises are generated.

A problem is different from a premise in its mode. For said in this way, "Is two-footed terrestrial animal the definition of human?" or "Is animal the kind of human?"

5. $101^{b}5$–6.

it is a premise; but said in this way, "Whether two-footed terrestrial animal is the definition of human or not," it becomes a problem. And similarly in the case of the others. So it makes perfect sense that problems and premises are equal in number; for one makes a problem out of any premise by exchanging its mode.

1.5
What a Definition, a Special Affection, a Kind, and a Coincident Are

We must say, then, what a definition, a special affection, a kind, and a coincident are. A definition is an account that signifies the essence. It is assigned either as an account in place of a name or as an account in place of an account; for it is also possible **102a1** to define some of the things that are [already] signified by an account. Those who merely assign a name, whatever it is, clearly do not assign the definition of the thing, since every definition is an account.

Nonetheless, this sort of thing—for example, that the noble is the appropriate—must also be posited as akin to definition. Similarly, whether perception and scientific knowledge are the same or distinct; for in fact, where definitions are concerned, most of our time is taken up with whether things are the same or distinct. Putting it simply, let us call all things "akin to definitions" that fall to the same methodical inquiry as definitions. And it is immediately clear that all the cases just mentioned are of this sort. For if we are able to argue dialectically that things are the same or that they are distinct, we will also be well equipped to attack definitions in the same way; for by proving that the two things are not the same, we will have done away with the definition. The converse of what we have just said, however, does not hold; for to establish a definition it is not enough to prove that two things are the same, although to disestablish one it is sufficient to prove that they are not the same.

A special affection is one that does not indicate the essence of a thing, belongs to that thing alone, and is counterpredicated of it. Thus it is a special affection of humans to be receptive of grammar; for if someone is human, he is receptive of grammar, and if he is receptive of grammar, he is human. For no one would say that something is a special affection if it admits of belonging to something else—for example, no one would say that sleeping is a special affection of humans, even if at some time it happened to belong only to them. Therefore, if something of this sort were said to be a special affection, it would be said to be such not unconditionally, but rather a special affection at a time, or in relation to something. Being on the right, for example, is said to be a special affection of something at a time, and two-footed is said to be a special affection in relation to something—for example, a special affection of humans in relation to horses or dogs. It is clear that nothing that admits of belonging to something else is counterpredicated of a thing—for example, if something is asleep, it is not necessary for it to be human.

A kind is what is predicated in the what-it-is of many things that differ in form. And let us say that what are predicated in the what-it-is are the sorts of things that it would be fitting to mention if we were asked what the proposed thing is—just as it is fitting in the case of a human, when asked what it is, to say that it is an animal. The problem of whether one thing is in the same kind as another, or in a distinct one, is also akin to the kind; for this sort of problem also falls to the same methodical inquiry as the kind. For if we argue dialectically that animal is the kind of human, and similarly of ox, we will have argued dialectically that they are in the same kind, while if we prove that it is the kind of one and that it is not the kind of the other, we will have argued dialectically that they are not in the same kind.

A coincident is something that is none of these (whether a definition, a special affection, or a kind), yet does belong to the thing. Also, it is what can belong or not belong to one and the same thing—for example, being seated can belong or not belong to the same thing, and so similarly can being pale; for nothing prevents the same thing from being at one time pale, at another time not pale. The second of these two definitions of a coincident is better; for if the first is stated, anyone who is going to comprehend it must already know what a definition, a kind, and a special affection are; while the second definition is complete in itself for knowing what the thing meant is intrinsically.

We may also add to what is coincident the comparisons between one thing and another that are stated in some way that derives from what is coincident—for example, whether the noble or the advantageous is more choiceworthy, or whether the life in accordance with virtue or the life of indulgence is more pleasant, or anything else that might be stated in much the same way as these; for in all such cases, the inquiry arises as to whether the coincident that is predicated belongs to a higher degree to one or to the other.

It is clear from these things that nothing prevents a coincident from becoming a special affection of something at a time or in relation to something—for example, sitting down, which is a coincident, will be a special affection at a time when only one person is sitting down, and when he is not the only one sitting down it will be a special affection of his in relation to those who are not sitting down. So nothing prevents a coincident from becoming a special affection either in relation to something or at a time. Unconditionally, however, it will not be a special affection.

1.6
No Universal Methodical Inquiry

One must not overlook the fact that the things said with regard to a special affection and a kind will all fit a definition too. For when we have proved that what is given

as a definition does not belong solely to what is under definition[6] (as we also do in the case of a special affection), or that it is not the [correct] kind that is assigned in the definition, or that one of the things stated in the account does not belong to the thing (which is just what might also be said in the case of a coincident), then we will have done away with the definition. So, in accord with the account given previously,[7] all the things we have enumerated would be in a way akin to definitions. But one must not, because of this, seek a single universal methodical inquiry applicable to all cases; for this is not an easy thing to find, and if it were found, it would be entirely lacking in perspicuousness and difficult to use for the proposed study. On the other hand, if we were to assign a special methodical inquiry to each of the kinds we have distinguished, on the basis of what is proper to each, a methodical route through the proposed thing could easily be produced. So we must, as was said previously, make an outline division, and as for the rest, we must attach whichever is most proper to each, and call them "akin to definitions," or "akin to kinds." The ones we mentioned[8] have pretty much been assigned to each.

1.7
The Number of Ways in Which Things Are Said to Be the Same

First of all we must determine the number of ways in which things are said to be the same. And sameness, taken in outline, would seem to be divided into three parts. For we usually call things the same in number, in form, or in kind: in number, when the names are several but the thing is one—for example, cape and cloak; in form, when, though the things are several, they are undifferentiated with respect to form—for example, one human and another human, or one horse and another horse (for things of this sort, which fall under the same form, are said to be the same in form); in kind, similarly, those things are the same that fall under the same kind—for example, horse and human.

It might seem that water from the same spring is said to be the same in a way that has some difference from those mentioned. Nonetheless, this too, at any rate, must be placed in the same part as things said to be the same in some way or other with respect to form; for all such things seem to be akin and much the same as each other. For all water is said to be the same in form as all other water because it possesses a certain similarity, and water from the same spring is different in no other way than that the similarity is much more pronounced. That is why we do not separate this

6. Reading τῷ ὑπὸ τὸν ὁρισμόν.

7. 102^a9–10.

8. I.e., the things akin to definition (102^a5–10) that get assigned to the kind *definition*; the things special but not unconditionally so (102^a24–26) that get assigned to the kind *special affection*; and the comparisons that derive from coincidents (102^b14–16) that get assigned to the kind *coincident*.

case from those that are said to be the same in some way or other with respect to a single form.

What is one in number seems to be most of all agreed to be said by everyone to be the same. But even this is usually assigned in several ways. The strictest and primary way is when sameness is assigned by a name or a definition—for example, "cloak" assigned to cape, or "two-footed terrestrial animal" to human. Second, when sameness is assigned by a special affection—for example, "receptive of scientific knowledge" assigned to human, "what by nature spatially moves upward" to fire. Third, when it is assigned from a coincident—for example, "the one seated" or "the musical one" to "Socrates"; for all these mean to signify oneness in number.

That what has just now been said is true may most of all be learned from cases in which we change the ways we call people; for often when we give an order to call someone who is seated, using his name, we change it, when the person to whom we give it happens not to understand us, on the supposition that he will understand us better from a coincident of the person, and so we tell him to call over to us, "the one seated," or "the one talking," clearly taking the same thing to be signified by the name as by the coincident.

1.8
Basis for the Proposed Division of Predicates

Let sameness, then, as was said,[9] be divided into three parts. **103b1**

Of the fact that arguments are based on the things mentioned previously, are through these and for these, one means of persuasion is by induction; for if one were to look at each premise or problem, it would be evident that it has stemmed either from definition, special affection, kind, or coincident.

Another means of persuasion is by deduction. For it is necessary for everything that is predicated of something either to be or not to be counterpredicated of the thing. And if it is counterpredicated, it must be either a definition or a special affection (a definition, if it signifies the essence; a special affection if it does not signify it; for we saw[10] that this is what a special affection is, what is counterpredicated but does not signify the essence). On the other hand, if it is not counterpredicated of the thing, it either is or is not among the things mentioned in the definition of the underlying subject. And if it is among the things mentioned in the definition, it must be either a kind or a difference, since a definition is composed of a kind and differences. But if it is not among the things mentioned in the definition, it is clear that it must be a coincident; for a coincident was said[11] to be what is neither a definition, nor a kind, nor a special affection, but still belongs to the thing at issue.

9. 103a7–8.
10. 102a18–22.
11. 102b4–7.

1.9
The Categories of Predicates

After this, therefore, we must determine the kinds of predication in which the four we mentioned are found. These are ten in number: what-it-is, quantity, quality, relative, where, when, position, having, doing, and being affected. For the coincidents, the kind, the special affections, and the definition will always be in one of these categories; for all premises [produced] through these signify either a what-it-is, a quantity, a quality, or some other category.

It is clear from the nature of the things themselves that what signifies the what-it-is will sometimes signify substance, sometimes quality, and sometimes some other category. For when human is set forth as an example and it says that what is set forth is human or animal, it says what it is and signifies substance. But when white color is set forth and he says that what is set forth is white or color, he says what it is and signifies quality. Similarly, if what is set forth is yard-long length, if he says that what is set forth is yard-long length, he says what it is and signifies quantity. And similarly in the case of the other categories; for each of these sorts of predicate, both when it itself is said of itself and when its kind is said of it, signifies what it is. But when it is said about another thing, it does not signify what it is, but its quantity, quality, or one of the other categories.

So, what arguments are about and based on are these and this many things. How we can get hold of them, and through what means we can be well equipped with them, must be stated next.

1.10
Dialectical Premises

First, therefore, it must be determined what a dialectical premise is and what a dialectical problem is. For not every premise or every problem must be counted as dialectical; for no one with any understanding would propose as a premise what no one believes, or as a problem what is evident to everyone; for the latter involves no puzzle, and the former no one would accept.

A dialectical premise is a making of a question out of what is acceptable, either to everyone, to most people, or to the wise (and, among these, either to all, to most, or to the best known), provided it is not unacceptable; for anyone would accept what seems to be so to the wise, provided it is not contrary to the beliefs of ordinary people. Dialectical premises also include things that are like acceptable beliefs; the contraries of what appear to be acceptable beliefs, when proposed by way of contradiction; and all beliefs that are in accord with the established crafts.

For if it is acceptable that the science of contraries is the same, it would also appear to be acceptable that the perception of contraries is the same. And if it is acceptable

that the craft of grammar is one in number, then the craft of pipe playing is also one in number, while if there are several crafts of grammar, then there are also several of pipe playing; for all these seem to be similar and akin.

Similarly, the contraries of what appear to be acceptable beliefs, when proposed by way of contradiction, will appear to be acceptable beliefs; for if it is acceptable that one must do good to one's friends, it is also acceptable that one must not do them evil. It is contrary that one must do one's friends evil, but by way of contradiction it is that one must not do them evil. Similarly, if one must do good to one's friends, to one's enemies one must not do it. And this is so too by way of contradiction of the contraries; for the contrary is that one must do one's enemies good. It is also the same way in other cases.

And, in juxtaposition, the contrary about the contrary will also appear to be acceptable. For example, if one must do good to one's friends, one must do evil to one's enemies. (To do good to one's friends might also appear to be contrary to doing evil to one's enemies, but whether this is truly so or not will be stated in our discussion of contraries.[12])

It is also clear that whatever beliefs are in accord with crafts are dialectical premises; for anyone would accept the things believed by those who have investigated these crafts—for example, a doctor about issues in medicine, or a geometer about those in geometry, and similarly in other cases.

1.11
Dialectical Problems

A dialectical problem is a speculation, directed either to choice and avoidance or to truth and knowledge (either by itself or when working together with something else of this sort), about which people believe nothing either way, or ordinary people believe in a contrary way to the wise, or the wise to ordinary people, or each of them to themselves. For it is useful to know some problems only in relation to choice and avoidance (for example, whether pleasure is choiceworthy or not), while it is useful to know others only in relation to knowledge (for example, whether the cosmos is eternal or not). But others are intrinsically of no use in relation to either of these but work together with some things of this sort; for there are many things that we do not wish to know intrinsically, but rather for the sake of other things, in order that, through them, we come to know something else. **$104^{b}1$**

Problems also exist where there are contrary deductions (for there is a puzzle as to whether it is so or not so, because there are persuasive arguments on both sides), as well as those we have no arguments about, because they are so large, thinking that it is difficult to give the why—for example, whether the cosmos is eternal or not; for one could also inquire about things of that sort.

12. $112^{b}27$–$113^{a}19$.

Let problems and premises, then, be determined as has been stated.

A thesis is an unacceptable supposition of someone well-known for philosophy—
20 for example, that contradiction is impossible (as Antisthenes used to say), or that everything moves (according to Heraclitus), or that what is is one (as Melissus says); for to give thought to it when some random person declares things contrary to our beliefs is simpleminded. Or: something contrary to our beliefs for which we have an argument—for example, that not everything that is either has come to be or is
25 eternally, as the sophists say;[13] for a musician who is grammatical is so without having become so or being so eternally; for even if someone does not believe this, he might believe it because of having an argument.

A thesis, then, is also a problem, but not every problem is a thesis, since some
30 problems are such that we have no belief about them either way. That a thesis is also a problem is clear; for it is necessary from what has been said either that ordinary people disagree with the wise about a thesis, or that one or the other lot disagrees among themselves, since a thesis is a certain unacceptable supposition. As things
35 stand, pretty much all dialectical problems are called "theses." But let it make no difference whatever they are called; for it is not because we wish to make up names that we have distinguished them in this way, but in order that we not fail to consider
105ᵃ1 whatever differences there actually are of them.

We must not, however, look at every problem or every thesis, but rather those that someone might puzzle over who is in need of arguments, not punishment or perception;[14] for those who puzzle over "whether one must honor the gods and love one's parents or not" need punishment, while those who puzzle over "whether snow is white or not" need perception. Nor, indeed, must one look at those whose demonstration is near at hand, or those whose demonstration is too remote; for the former involve no puzzle, while the latter involve more of one than is in accord with [dialectical] training.

1.12
Deduction and Induction

10 Having determined these things, then, we must distinguish how many forms of dialectical argument there are. One is induction, another deduction. And what deduction

13. The argument referred to is apparently this: (1) Socrates was musical and became grammatical. (2) Therefore, Socrates, being musical, is grammatical. (3) Therefore, Socrates, being grammatical, is musical. (4) Socrates has not always, being grammatical, been musical. (5) Therefore, it must be that Socrates, being grammatical, has become musical. (6) Therefore, being musical, Socrates became musical and, being grammatical, he became grammatical. (7) Therefore, Socrates was musical before he became musical and grammatical before he became grammatical. (8) But Socrates was not always or eternally either musical or grammatical.
14. *NE* 1179ᵇ23–1180ᵃ5, *Ph.* 254ᵃ24–33.

is was stated previously.[15] Induction is the route from particulars to the universal—for example, if a ship's captain with scientific knowledge is the most excellent one, and so with a charioteer, then, in general, the person who has scientific knowledge about anything is best. Induction is more persuasive, more perspicuous, better known by perception, and common to ordinary people, but deduction has greater force and is more effective against those skilled in logico-linguistic disputation.

1.13
The Four Instruments

Let the kinds, then, of the things arguments are about and on which they are based be determined as was stated previously.[16] The instruments through which we will become well equipped with deductions are four: one is getting hold of premises; the second is being able to distinguish in how many ways something is said of things; the third is finding the differences; and the fourth is the investigation of likeness. There is a way in which the last three of these are also premises, since it is possible to make a premise of each of them—for example, that either the noble, the pleasant, or the advantageous is choiceworthy; or that perception differs from scientific knowledge in that it is possible to get the latter back again after losing it but not the former; or what conduces to health is related to health as what conduces to the good state is to the good state. The first is a premise from what is said to be something in many ways; the second is one from differences; the third is one from like things.

1.14
(1) Getting Hold of Premises

Premises must be selected in as many ways as were determined in connection with premises, by having ready to hand the beliefs either of everyone, of most, or of the wise (and of these, the beliefs of all, most, or the best known), provided they are not contrary to the apparent ones, and whatever beliefs are in accord with the crafts (but one must propose even the contraries of apparently acceptable premises by way of contradiction, as was stated previously[17]). **105b1**

It is also useful in selecting these to produce not only the ones that are acceptable but the ones that are like them—for example, that the perception of contraries is the same (for the science of them is too), or that we see by taking something in, not sending something out (for it is this way too in the case of the other perceptual modalities, since we hear by taking something in, not sending something out, taste in

15. 100a25–27.
16. 1.4–12.
17. 104a8–15.

the same way, and it is the same way too in the case of the others). Further, whatever appears to be so in all or in most cases must be taken as a starting-point and seeming posit (for those who have not seen in which case it is not so accept it).

One must also select premises from written accounts and produce catalogs of them concerning each kind of subject, putting them under separate headings—for example, concerned with goodness, concerned with life, and concerned with every sort of goodness—starting with the what-it-is. And one must also take note of the beliefs of particular people—for example, that it was Empedocles who said that there are four elements of bodies (for anyone might accept what was said by a reputable person).

In outline, there is a three-part division of premises and problems; for some premises are ethical, some are natural scientific, and some are logico-linguistic. Premises such as the following are ethical—for example, whether one must obey one's parents rather than the laws, if they disagree; logico-linguistic—for example, whether the science of contraries is the same or not; natural scientific—for example, whether the cosmos is eternal or not. And similarly for the problems. What each of the ones mentioned is like, though, is not easily given in definitions concerning them, and one must try to come to know each of them by the intimacy that comes through induction, examining them by reference to the paradigms that were mentioned.

In relation to philosophy, premises and problems must be treated in accord with truth, but dialectically, in relation to belief.

All premises must be selected in the most universal version possible, and one premise made into many—for example, "the science of opposites is the same" must be made into "the science of contraries is the same, and the science of relatives is." Then these premises must in turn be divided up in the same way, as far as is possible to divide them up—for example, "the science of good and bad is the same, and that of white and black, and that of cold and hot." And similarly in the case of the others.

1.15
(2) Distinguishing in How Many Ways Something Is Said of Things

106a1 About premises, then, the foregoing remarks are sufficient. As regards the number of ways [something is said to be something], we must not only treat those that are said to be something in distinct ways but also try to give accounts of them—for example, not only that justice and courage are said to be good in one way, while what conduces to a good state and what conduces to health are said to be so in a distinct one, but also that the former are said to be such by being themselves of a certain sort, while the latter are said to be such by being productive of something, and not by being themselves of a certain sort. And in like manner in the other cases.

Whether the ways in which something is said to be something are many or one in form is something one must get a theoretical grasp on by means of the following:

First, look at the contrary to see whether it is said of things in many ways and if they disagree either in form or in name. For sometimes their distinctness is immediately visible in their very names—for example, to sharp in sound dull is contrary, while in a body blunt is. It is clear, then, that what is contrary to sharp is said of things in many ways. But if that is so, sharp is too; for in each of these cases a distinct thing will be what is contrary. For the same sharp will not be contrary to blunt and dull; yet sharp is contrary to each. Again, to dull in sound sharp is contrary, but in a body round is, so that dull is said of things in many ways, since its contrary is too. And similarly to noble in the case of an animal ugly is the contrary, while in the case of a house ramshackle is, so that noble is homonymous.

In some cases there is no disagreement whatever in the names, but in the form, the difference in them is immediately clear—for example, in the case of bright and dark. For a voiced sound is said to be bright or dark, and similarly a color. In names, these do not disagree at all, but in the form the difference in them is immediately clear; for a color and a voiced sound are not said to be bright in the same way. This is also clear through perception; for the same perceptual modality perceives things that are the same in form, but we do not discern bright in the case of a voiced sound and of a color by the same perceptual modality; rather, we perceive the latter by sight and the former by hearing. It is the same way with sharp and dull in tastes and in bodies: we discern the latter by touch, the former by taste. For these too do not disagree in name, neither in the case of themselves nor in the case of their contraries; for in fact dull is what is contrary to each.

Further, see whether there is something that is contrary to one, while to the other there is simply nothing—for example, to the pleasure that derives from drinking the pain that derives from being thirsty is contrary, while to the pleasure that derives from getting a theoretical grasp on the fact that the diagonal is incommensurable with the side nothing is contrary. So things are said to be a pleasure in many ways. And hating **106b1** is contrary to loving in thought, while to loving as bodily activity nothing is.[18] It is clear, then, that loving is homonymous.

Further, in the case of intermediates, see whether there is something intermediate to one [pair of contraries] but nothing to the other, or if there is something in both cases, but not the same thing—for example, between bright and dark in color, there is gray, but in sound there is none, unless it is husky, as some people say that the husky voice is intermediate. So bright is homonymous, and similarly dark.

Further, see whether there are several intermediates for one pair but one for the other, as in the case of bright and dark; for in the case of colors the intermediates are many, while in the case of voiced sounds there is one, husky.

Further, look at the contradictory opposite to see whether it is said of things in many ways; for if it is said of things in many ways, what is opposite to it will also be said of things in many ways. For example, not seeing is said of things in many ways,

18. The contrast is like that between our love as a feeling or emotion and making love.

one of which is not having sight and the other not activating sight. But if not seeing is said of things in many ways, then seeing must be too; for to each not seeing something is opposed: having sight to not having it, and activating sight to not activating it.

Further, look at things said by way of privation and having; for if one of these is said of things in many ways, the remaining one is too. For example, if having perception is said of things in many ways, as soul and also as body, lacking perception will also be said in many ways, as soul and also as body. And that it is by way of privation and having that the things just mentioned are opposed is clear, since it is natural for animals to have each of the two sorts of perception both as soul and as body.

Further, one must look at the inflections. For if justly is said of things in many ways, just will be said of things in many ways too; for there is a just corresponding to each justly. For example, if justly is said of both judging in accord with one's own consideration and judging as one should, it is similar too with just. In like manner, if conduces to health is said of things in many ways, then conducively to health will be said in many ways too. For example, if what conduces to health is productive of, protects, or is a sign of health, then conducively to health will be productively, protectively, or by way of being a sign of it. And similarly in other cases, when something is itself said of things in many ways, an inflection derived from it will also be said of things in many ways, and if the inflection is, so is it itself.

Look too at the kinds of predication of the name to see whether these are the same in all cases; for if they are not the same, it is clear that the name mentioned is homonymous. For example, the good in foods is what is productive of pleasure, in medicine, what is productive of health, while in the case of the soul, it is being of a certain sort (for example, temperate, courageous, or just), and similarly in the case of a human being. Sometimes it is a time—for example, what is opportune (for what is opportune is said to be good). Often, it is a quantity—for example, in the case of the moderate amount (for the moderate amount is also said to be good), so that good is homonymous.

In like manner, bright is a color in the case of a body, but in the case of a voiced sound it is what is easy to hear. Sharp is much the same way; for in like manner, it is not said in the same way of things in all cases; for it is the rapid sound that is sharp (as those who do arithmetical harmonics say[19]), but it is the angle less than a right one that is sharp [acute], or a knife with a sharp-angled edge.

Look too at the kinds of things that fall under the same name to see whether they are distinct and not one subordinate to another. For example, donkey: both the animal and the implement;[20] for the account that corresponds to the name is distinct for these; for the one will be said of things as animal of a certain sort, the other as implement of a certain sort. But if the kinds are one subordinate to another, it is not necessary for the accounts to be distinct. For example, of raven both animal and bird are kinds. When we say that a raven is a bird, then, we also say that it is a certain sort

19. I.e., the Pythagoreans.

20. I.e., a sort of steam engine.

of animal, so that both kinds are predicated of it. Similarly, when we say that a raven is a flying two-footed animal, we say that it is a bird. In this way too, then, both kinds are predicated of the raven. But in the case of kinds not subordinate one to another, this does not happen; for when we say that something is an implement, we do not say that it is an animal; nor, when we say that it is an animal, do we say that it is an implement.

Look not only at the proposed thing to see whether the kinds are distinct and not one subordinate to another, but also its contrary; for if its contrary is said of things in many ways, it is clear that the proposed thing is too.

It is also useful in the case of a definition to look to see what comes about when it is of a composite—for example, of bright body or bright sound; for if what is special is subtracted, the same account must remain. But this does not happen in the case of homonyms—for example, in the case of the ones just mentioned; for the one is body having such-and-such color, and the other is sound that is easy to hear. When we subtract body and sound, then, what remains in each is not the same. But it certainly should have been, if indeed the white said in each case was synonymous.

But often something homonymous follows along unnoticed in the accounts themselves. That is why one must in fact look at the accounts too. For example, if someone says that what is a sign of and productive of health is what is in moderation, one must not give up but rather must look to see what in each case he has meant by "what is in moderation"—for example, if the one is of such a quantity as to produce health and the other is such as to signify of what sort the state is.

Further, one must look to see whether they are not comparable with respect to more or equally—for example, a bright sound and a bright cloak, or a sharp taste and a sharp sound; for these are not said to be equally bright or equally sharp, nor is one said to be more so than the other, so that bright and sharp are homonymous. For all synonymous things are comparable; for either they will be said to be equally such, or one more so than the other.

Since the differences of kinds that are distinct and not one subordinate to another are also distinct in form, for example, of animal and of scientific knowledge (for the differences of these are distinct), look to see whether the things falling under the same name are differences of kinds that are distinct and not one subordinate to another—for example, sharp [said] of a voiced sound and of a body; for one voiced sound is differentiated from another by sharpness, and similarly one body from another. So sharp is homonymous; for these sharpnesses are differences of kinds that are distinct and not one subordinate to another.

Again, see whether the things falling under the same name have themselves distinct differences—for example, those of color in the case of bodies and in pieces of music; for the differences of color in the case of bodies are dilating and contracting of sight,[21] while in the case of pieces of music, the differences are not the same. So color is homonymous; for the same things have the same differences.

21. Plato, *Timaeus* 67d–e.

Further, since the form is not a difference of anything, look at the things falling under the same name to see whether one is a form and the other a difference—for example, bright in the case of bodies is a form of color, while in the case of sounds it is a difference; for one sound is differentiated from another by being bright.

1.16
(3) Finding Differences

One must investigate the many ways [in which one thing may be said of another], then, by means of these and the like [procedures].

As for differences, one must look at those within the same kinds in relation to each other, for example, in what respect justice differs from courage, or practical wisdom from temperance (for all these are in the same kind), and in those from one kind in relation to another, if they are not too very far apart (for example, in what respect perception differs from scientific knowledge); for in the case of things that are very far apart, the differences are immediately clear.

1.17
(4) Seeing Similarities

As for similarity, one must first look at it in the case of things in distinct kinds, on the supposition that as one is to one, so the other is to the other (for example, as scientific knowledge is to the scientifically knowable, so perception is to the perceptible), and that as one thing is in one, so another is in another (for example, as sight is in the eye, so understanding is in the soul, or as calm is in the sea, so stillness is in the air). We must train ourselves above all on things that are very far apart; for in the case of the rest, we will more easily be able to see the points of similarity. And one must also look at things in the same kind to judge whether anything that is the same belongs to all of them—for example, to human, horse, and dog; for to the extent that the same something belongs to all of them, to that extent they are alike.

1.18
Usefulness of the Last Three Instruments

It is useful, on the one hand, to have looked at how many ways something is said of things with an eye to perspicuousness (for someone would better know what he is positing, if it had been made evident in how many ways it is said of things) and to making deductions that are related to the thing at issue itself and not to a name; for when it is unclear in how many ways something is said of things, it is possible that the

answerer and the questioner are not directing their thought to the same thing. But when it has been made evident in how many ways it is said of things, and to which of them the answerer is directing his thought in positing it, the questioner would appear ridiculous, if he did not make his argument about this. It is also useful with an eye to not getting trapped by a fallacy and to trapping others by a fallacy. For if we know in how many ways something is said of things, we will not be trapped by a fallacy ourselves, but rather will know if the questioner did not produce his argument in relation to the same thing [as we answered about]. And when we ourselves are questioning, we will be able to trap others by a fallacy, if the answerer should happen not to know in how many ways something is said of things. This is not possible in every case, but only when some of the things said in many ways are true and others false. This mode [of argument], however, is not proper to dialectic, which is why dialecticians must altogether avoid this sort of thing, arguing dialectically regarding a name, unless one is otherwise wholly unable to argue dialectically about the proposed thing.

Finding differences, on the other hand, is useful both with an eye to deductions about same and distinct and to knowing what each given thing is. That it is useful with an eye to deductions about same and distinct is clear (for when we have found any difference whatever between the things proposed, we will already have proved that they are not the same); and it is useful in relation to knowing what something is, because we usually separate the special account of the substance of each thing by the differences that are proper to it.

Getting a theoretical grasp on similarity is useful in relation to inductive arguments, deductions from a hypothesis, and to giving definitions:

It is useful in relation to inductive arguments, because it is by induction from particulars, in the case of their similarity, that we claim we have a right to bring in the universal; for it is not easy to do an induction if we do not know the points of similarity.

It is useful in relation to deductions from a hypothesis, because it is an acceptable belief that as it is in the case of one of a number of like things, so it is in the case of the rest. So, whichever of these we may be well equipped to argue dialectically about, we will obtain an agreement beforehand that however things stand in their case, so they also stand with the proposed thing. And when we have proved the former, we will also have proved what was proposed on the basis of a hypothesis; for it was by hypothesizing that however things stand in the case of these, so they also stand with the proposed thing, that we produced our demonstration.

It is useful in relation to giving definitions, because if we can see what is the same in each case, we will not be puzzled as to what kind the proposed thing falls into when we are defining it; for of what is common, what is predicated in the what-it-is would most likely be the kind.[22] In the same way, getting a theoretical grasp on the

22. Since the difference—the other thing predicated in the what-it-is—is more likely to distinguish than to be something common.

similarity in things that are very far apart is also useful in relation to definitions—for example, that a calm in the sea and a stillness in the air are the same (for each is a quietness), or a point in a line and a unit in a number (for each is a starting-point). So, if we assign what is common to all of them as the kind, we will not seem to be defining in an irrelevant way. And, in fact, those who define things[23] are pretty much accustomed to giving definitions in this way; for they say that the unit is the starting-point of number and that the point is the starting-point of line. It is clear, then, that they place them in the kind that is common to both.

These, then, are the instruments through which deductions are made. The topics in relation to which the ones mentioned are useful are as follows.

BOOK 2

2.1
Issues Concerning Problems

Among problems, some are universal, others particular. Examples of universal ones: every pleasure is good, no pleasure is good. Examples of particular ones: some pleasure is good, some pleasure is not good. And the procedures for universally establishing and disestablishing are common to both kinds of problems; for when we have proved that F[24] belongs to all, we will also have proved that it belongs to a particular one; and similarly, if we prove that F does not belong to any, we will also have proved that it does not belong to all. First, then, we must speak about the procedures for universally disestablishing,[25] because such procedures are common both to universal and to particular problems, and because people more often introduce theses consisting in F belonging than in F not belonging, while those who are arguing dialectically with them seek to disestablish this.

It is very difficult, however, to convert a name deriving from a coincident that is proper to something; for belonging in some way but not universally is possible only in the case of coincidents. For when it derives from a definition, a special affection, or a kind, it is necessarily convertible. For example, if it belongs to something to be a two-footed terrestrial animal, it will be true by conversion to say that it is a two-footed terrestrial animal. Similarly, if the name derives from a kind; for if being animal belongs to something, then it is an animal. And the same things are so in the case of a special affection; for if being receptive of grammar belongs to something, it will be receptive of grammar. For none of these admits of partly belonging or not

23. Probably Platonists. See *Met.* 987b1–9, 987b29–33, 1039a24–26.

24. F is a supplied variable whose particular instances are the things said to belong.

25. These (embodied in topics), with some identified as also useful for establishing, seem to remain in focus until 3.6, where the application to particulars is discussed.

belonging, but must unconditionally belong or not belong. In the case of coincidents, however, there is nothing to prevent one—for example, whiteness or justice—from partly belonging, and so it is not enough to prove that whiteness or justice belongs to someone in order to prove that he is white or just; for it is open to dispute whether he is [only] partly white or partly just. So in the case of coincidents, conversion is not necessarily valid.

We must also determine the errors that occur in problems, because these are twofold, caused either by false statement or by violation of the established style of speech; for those who make false statements, and say that F belongs to something it does not belong to, commit error; while those who call things by the names of other things—for example, calling a plane-tree "human"—violate the established use of names.[26]

2.2
Various Topics

One topic[27] is looking to see whether one's opponent has assigned as a coincident something that belongs in some other way. This error is most often committed in regard to kinds—for example, if someone were to say that to be a color is a coincident of white; for being a color is not a coincident of white, but rather the kind of it is color. It is possible, of course, for an opponent in fact to determine his use of the name in what he posits—for example, saying that being a virtue is a coincident of justice. But often, and without such a determination, it is immediately clear that **$109^{b}1$** he has assigned the kind as a coincident—for example, if someone were to say that whiteness is colored or that walking is in movement. For a predicate of the kind is never said paronymously of the form, but always the kinds are predicated synonymously of the forms; for the forms take on both the name and the account of their kinds. A person, then, who says that white is colored has not assigned colored as its kind, since he has spoken paronymously, nor as a special affection, nor as a definition; for the definition and special affection of a thing belong to nothing else, while many other things are also colored—for example, a piece of wood, a human, a horse. It is clear, then, that he assigns colored as a coincident.

Another topic is to examine cases where F has been said to belong to all or to none. Look at them form by form and not in their unlimited number; for then the inquiry will proceed in a more methodical way and in fewer steps. And one must look at, and start with, the primary ones,[28] and then proceed step by step toward the indivisible ones. For example, if a person has said that of opposites the science is the same, one must look to see whether of relatives, of contraries, of privation and having, and of things said by way of contradiction the science is the same. And if the

26. $140^{a}3$–17, $148^{b}16$–22.
27. Reading τόπος.
28. I.e., the ones that are the most universal. See $105^{b}31$–37.

situation is not yet evident at this level, one must again divide these until one comes to the indivisible ones, and see, for example, whether it be so of just and unjust things, the double and the half, blindness and sight, or being and not being. For if in any case it is proved that the science is not the same, we will have done away with the problem. One proceeds in the same way if a predicate belongs in no case. This topic is convertible for purposes of establishing and disestablishing. For if, when we have introduced a division, F appears to belong in all or in many cases, one must demand that the opponent posit the universal, or else bring an objection and show in what case it is not so; for if he does neither of these, not positing it will make him appear absurd.

Another topic is to produce accounts both of a coincident and what it is a coincident of, either of both, each taken singly, or else of one of them, and then look to see whether anything untrue in these accounts has been assumed as true. For example, if the problem is whether it is possible to do injustice to a god, ask: "What is doing injustice?" For if it is to harm voluntarily, it is clear that it is not possible for a god to suffer injustice; for it is not possible for a god to be harmed. And if it is whether the excellent person is envious, ask: "What is the envious person and what is envy?" And if envy is pain at the apparent doing well of some decent person, it is clear that the excellent person is not envious; for then he would be base. And if it is whether the indignant person is envious, ask: "What is each of them?" For thus it will be immediately evident whether what was stated is true or false. For example, if the envious person is the one who is pained at good people's doing well, and the indignant person is the one who is pained at bad people's doing well, it is clear that the indignant person would not be envious. One must also replace the names in the accounts with their accounts, and not stop until one comes to one that is known; for often, though the whole account has been assigned, what is being inquired about is not yet clear, while if an account is stated of one of the names in the account, it becomes clear immediately.

Further, one must make the problem into a premise for oneself and then bring an objection; for an objection will serve as an attack against the thesis. This topic is pretty much the same as the topic that one must look into cases where F is said to belong in all or in none of something, but it differs in its mode.

Further, one must determine what sorts of things must be called what ordinary people call them and what sorts must not; for this is useful both for establishing and for disestablishing something. For example, one must say that the things at issue must be named using the names as ordinary people do, but that when we ask which of the things at issue are of such-and-such a sort or not of such-and-such a sort, one must no longer turn one's attention to ordinary people. For example, one must say that to conduce to health is to be productive of health, as ordinary people do, but when it comes to whether the proposed thing is productive of health or not, one must no longer name it as ordinary people do, but as the doctor does.

2.3
Topics Relating to Things Said in Many Ways

Further, if F is said of things in many ways, and it has been proposed that it belongs or that it does not belong to something, one must prove it to do so or not to do so in one of the ways, if one cannot prove it in both.[29] This [topic] must be used in cases that escape notice; for if it does not escape notice that F is said of things in many ways, the opponent will object that the very one he raised a puzzle about has not been dialectically argued against but rather the other one. This topic is convertible both for purposes of establishing and for purposes of disestablishing. For if we wish to establish, we will prove that in one way F belongs, if we cannot prove it belongs in both; while if we are disestablishing, we will prove that in one way F does not belong, if we cannot prove it does not belong in both.

Except, in disestablishing there is no need to argue dialectically from something that is agreed to, either when F is said to belong to all or to none; for if we prove that F does not belong to something (whatever it is), we will have done away with its belonging to all. Similarly, if we prove that F belongs to one thing, we will do away with its belonging to none. If, however, we are establishing, we must obtain an agreement beforehand that if F belongs to some thing (whatever it is), it belongs to every one, provided this claim is a persuasive one. For it is not enough for purposes of proving that it belongs to all to argue dialectically that it belongs to one—for example, if the human soul is immortal, all soul is immortal. So an agreement must be obtained beforehand that if some soul (whatever it is) is immortal, all soul is immortal. This is not to be done in every case, but only when we are not well equipped to state a single argument that applies to all cases in common, as the geometer can that the triangle has its angles equal to two right angles.

But were it not to escape notice that F is said of things in many ways, distinguish in how many ways it is said, both when disestablishing and when establishing. For example, if what must be done is what is advantageous or what is noble, one must try to establish or to disestablish both concerning the proposed thing—for example, proving that it is both noble and advantageous, or that it is neither noble nor advantageous. But if it is not possible to prove both, one must prove one, and add a sign that while in one way it is so, in the other it is not so. The same argument also applies when the number of ways distinguished is more than two.

Again, there are those Fs that are said of things in many ways, not homonymously, but in some other way. For example, the science of many things is one, in the way one thing is the end, another what furthers the end—for example, medicine is the science both of producing health and of dieting; or in the way that both are ends, as the science of contraries is said to be the same (for one is no more an end than the other); or intrinsically and coincidentally—for example, the triangle has its angles equal to

29. For simplicity, Aristotle is supposing that the many ways are actually just two.

two right angles intrinsically, but the equilateral has them so coincidentally: for it is coincidental to the equilateral to be a triangle,[30] and it is by this that we know that it has angles equal to two right angles. If, then, it is not possible in any of these ways for the science of many things to be the same, it is clear that this is wholly impossible; or, if it is possible in some way, it is clear that it is possible. One must distinguish as many ways as are useful. For example, if we wish to establish something, we must put forward the sorts in which it is possible, and distinguish only those that are useful for establishing something. But if we wish to disestablish it, we must do so with those in which it is impossible, and leave the rest aside. One must also do this when the number of ways in which F is said of things escapes notice.

Also, that this is, or is not, of [or for] that must be established on the basis of the same topics—for example, that this science is of that, either as an end or as what furthers the end, as what is coincidental, or, again, as what is not of something in any of these ways. And the same argument also applies concerning appetites and whatever else is said to be of [or for] several things; for an appetite that is for a certain thing may be for it as an end (for example, for health), or as what furthers the end (for example, for taking medicine), or as what is coincidental, as in the case of wine, the lover of sweet things has an appetite for it not because it is wine but because it is sweet. For he has an appetite intrinsically for the sweet, but coincidentally for the wine; for if it is dry, he no longer has an appetite for it. Hence his appetite for it is coincidental.

This topic is useful in the case of relatives; for cases of this sort are pretty much cases of relatives.

2.4
Additional Topics

Further, there is substituting for a name one that is better known—for example, substituting "perspicuous" in a supposition for "exact," and "meddlesome person" for "busybody"; for the thesis becomes easier to attack when what is stated is better known. This topic is also common both to establishing and to disestablishing.

In order to prove that contraries belong to the same thing, look at its kind. For example, if one wishes to prove that there is correctness and error with regard to perception, and to perceive is to discern, and discerning can be done correctly or incorrectly, then there would be correctness and error with regard to perception too. In the present instance, the demonstration proceeds from the kind and is with regard to the form; for discerning is the kind of perceiving; for the one who perceives discerns in a way. But it may proceed in the contrary direction, from form to kind; for

30. The essence of the equilateral involves having three equal sides, but makes no reference to angles. Thus it is an intrinsic coincident of it (something demonstrable from its essence but not part of it) that it is a triangle.

whatever belongs to the form belongs also to the kind—for example, if there is a base and an excellent scientific knowledge, there is also a base and an excellent disposition; for disposition is the kind of scientific knowledge.

The first topic is false for purposes of establishing something, but the second is true. For it is not necessary for whatever belongs to the kind to belong also to the form; for animal is winged and two-footed, but human is not. But whatever belongs to the form does necessarily belong also to the kind; for if human is excellent, animal is excellent too. On the other hand, for purposes of disestablishing something, the first topic is true, but the second is false; for all that do not belong to the kind do not belong to the form either, but those that do not belong to the form do not necessarily not belong to the kind.

It is necessary for those things of which the kind is predicated to have one of its forms predicated of them too, and those things that are possessed of the kind or are paronymously said to be what they are from the kind must also be possessed of one of its forms or be paronymously said to be what they are from one of its forms (for example, if scientific knowledge is predicated of something, then grammatical or musical knowledge, or knowledge of one of the other sciences, will also be predicated of it; and if anyone possesses scientific knowledge or is paronymously said to be what he is from scientific knowledge, he will also possess grammatical or musical knowledge or knowledge of one of the other sciences, or will be paronymously said to be what he is from one of them—for example, a grammarian or a musician. And since that is so, if a thesis is stated that derives something in any way from a kind (for example, that soul is moved), look to see whether it is possible for soul to be moved with any of the forms of movement—for example, whether it can grow, pass away, or come to be, or move with any of the other forms of movement;[31] for if it is moved with none of them, it is clear that it is not moved at all. This topic is common for the purposes of both uses—for those of establishing and for those of disestablishing; for if the soul moves with one of the forms of movement, it is clear that it does move, but if it moves with none of these forms, it is clear that it does not move.

If one is not well equipped to attack a thesis, look at it on the basis of the definitions, whether really of the thing proposed or seeming to be so, and, if one is not enough, draw on several. For it will be easier to attack once definitions have been given; for against defined things attack is easier.[32]

In the case of the thing proposed, look to see what if it is so, then the one proposed is so, or what thing is of necessity so, if the thing proposed is so. If one wishes to establish it, look to see what if it is so, then the one proposed will be so (for if the former is proved to be so, the one proposed will also have been proved to be so).[33] On the other hand, if one wishes to disestablish it, look to see what is so if the thing

31. *Ph.* 225b5–9.

32. Reading πρὸς γὰρ τοὺς ὁρισμοὺς ῥᾴων ἡ ἐπιχείρησις.

33. This topic seems to be a case of modus ponens.

proposed is so; for if we prove that what follows from the thing proposed is not so, we will have done away with the one proposed.[34]

Further, look at time to see whether there is any discordance anywhere—for example, if the opponent has said that what is nourished of necessity grows; for animals are nourished all the time, but are not growing all the time. Similarly, if he has said that scientifically knowing is remembering; for the latter is of time past, but the former is also of the present and the future. For we are said to scientifically know present things and future ones (for example, that there will be an eclipse), but it is impossible to remember anything other than what is past.

2.5
A Sophistical Topic and Others

Further there is the sophistical topic,[35] which consists in leading the discussion into the sort of thing against which we are well equipped with lines of attack. Sometimes it will be a necessity, sometimes an apparent necessity, sometimes neither an apparent necessity nor a necessity.

It is a necessity when the answerer has refused to grant one of the things made use of[36] in relation to the thesis, and the questioner makes his arguments against it, and it happens to be of the sort against which he is well equipped with lines of attack. Similarly, it is also a necessity when the questioner, producing an abduction[37] against something due to what is proposed, tries to do away with it; for when it has been done away with, what is proposed is done away with too. It is an apparent necessity, when what the arguments come to proceed against appears to be useful and proper to the thesis, without being so, either when the one who is standing up to the argument has refused to grant it, or when the questioner, from an acceptable abduction based on the thesis, has proceeded with refuting it. The remaining case is when what the arguments come to proceed against is neither a necessity nor an apparent necessity, but, contrary to what should be so, the answerer happens to be refuted on a side issue. One must watch out for the last mode of those stated; for it seems to be wholly far away from and foreign to the craft of dialectic.[38] That is why too the answerer must not lose his temper, but grant things that are not useful against his thesis, but adding a sign when he does not believe one, though he grants it. For questioners for the most

34. This topic seems to be a case of modus tollens.
35. *SE* 172^b25–27.
36. I.e., some premise P that the answerer has made use of because he is defending thesis T, and T commits him to P. Since the questioner is well equipped with lines of attack against P, he can attack T by attacking it.
37. *APr.* 2.25.
38. Because it relies on chance or luck. See *Met.* 981^a3–5, †*MM* 1207^a4–5.

part find themselves more puzzled if, when all premises of this sort have been granted to them, they do not reach a conclusion.

Further, each time a person says anything whatever he in a way says many things, since each thing he says has many necessary consequences—for example, the person who has said that something is a human has also said that it is an animal, animate, two-footed, and receptive of understanding and scientific knowledge, so that by doing away with any one of these consequences whatever, the thing said initially is also done away with. But one must watch out for making a substitution of a more difficult premise; for sometimes a consequence is easier to do away with, but sometimes the thing proposed itself is.

2.6
Additional Topics

As for things to which of necessity only either F or G belongs (for example, to a human either disease or health), if we are well equipped to argue dialectically against one of the two belonging or not belonging, we will be well equipped against the remaining one as well. And this is convertible for both establishing and disestablishing; for if we have proved that one belongs, we will have proved that the remaining one does not belong; but if we prove that the one does not belong, we will have proved that the remaining one does belong. It is clear, then, that this topic is useful for both.

Further, there is attacking by translating a name in accord with its [literal] account,[39] as more fitting to take than the established [equivalent] name—for example, taking "good souled" (*eupsuchos*) not as "courageous" (*andreios*), as now established, but as "having good in one's soul" (*ton eu tên psuchên echonta*), just as "optimistic" (*euelpis*) too is "the one hoping for good things" (*ton agatha elpizonta*). Similarly, *eudaimôn* ("happy") may be taken as "the one whose *daimôn* is excellent"—as Xenocrates calls "happy" the one who has an excellent soul;[40] for the soul is each person's *daimôn*.

Since some things at issue are so of necessity, some for the most part, and some **112^{b}1** however luck may have it, if what is so of necessity is posited as being so for the most part, or what is so for the most part as being so of necessity (either it itself or what is

39. This topic seems to be an outlier—indeed, an odd topic altogether—until we see it in association with, especially, the next one. Suppose, for example, the answerer is defending the thesis that what is *andreios* is not of necessity good. The questioner must first get him to agree, as in accord with established usage he will, that what is *andreios* is of necessity *eupsuchos*. He must then translate *eupsuchos* as literally "having good in one's soul," which is the contrary of the answerer's thesis. Thus the present topic relies on something like the necessity of what is analytic, and so fits in with the other theses in this chapter, all of which have to do with the modal status of theses.

40. F155 Isnardi.

its contrary for the most part), it always provides a topic for the purposes of attack. For if what is so of necessity is posited as being so for the most part, it is clear that the answerer says that F does not belong to all, when it does belong to all, so that he was in error. As he is too if he has stated that what is said to be so for the most part is so of necessity; for then he has stated that it belongs to all, when it does not belong to all. Similarly, if he has stated that the contrary of what is so for the most part is so of necessity; for the contrary of what is so for the most part is always said of things comparatively rarely—for example, if human beings are for the most part base, they are good comparatively rarely. So he was in still greater error, if he has stated that they are of necessity good. It is the same way too if he has stated that what is however luck may have it is so of necessity or for the most part; for what is however luck may have it is so neither of necessity nor for the most part. And even if the opponent has made his statement without distinguishing whether something holds for the most part or of necessity, if in fact the thing at issue is so for the most part, it is possible to argue dialectically as if he had stated it to be so of necessity. For example, if he has stated, without drawing a distinction, that disinherited people are bad, one may argue dialectically as if he had stated it to be so of necessity.

Further, also look to see whether the opponent has posited something as a coincident of itself, on the supposition that it is a distinct thing because it has a distinct name, as Prodicus used to divide pleasures into joy, delight, and merriment; for all these are names of the same thing: pleasure. If, then, someone says that enjoying is a coincident of being merry, he would be saying that it is a coincident of itself.

2.7
Contraries

Since contraries can be combined with each other in six ways, and four of these combinations produce contrariety, one must get hold of contraries in such a way as would be useful both for doing away with things and for establishing them. In any case, it is clear that there are six ways of combining them. For each of the contrary predicates[41] will be combined with each of the contrary subjects, and this in two ways—for example, doing good to friends and doing evil to enemies, or conversely doing evil to friends and doing good to enemies. Or both predicates with one subject, and this also in two ways—for example, doing good to friends and doing evil to friends, or doing good to enemies and doing evil to enemies. Or one predicate with

41. The contraries in the examples are nominalized incomplete sentences ("to do good to friends," "to do evil to enemies") consisting of an infinitive ("to do good," "to do evil") and a noun ("friends," "enemies"), where both the infinitives and the nouns are themselves contraries. In a thesis, the incomplete sentences would be completed: "one must do (or it is choiceworthy to do) good to friends and evil to enemies." See 104a22–26.

both subjects, and this also in two ways—for example, doing good to friends and doing good to enemies, or doing evil to friends and doing evil to enemies.

The first two, then, of the stated combinations do not produce contrariety. For **113ª1**
doing good to friends is not contrary to doing evil to enemies; for both are worthy of choice and belong to the same character. Nor is doing evil to friends contrary to doing good to enemies; for in fact both are worthy of avoidance and belong to the same character. And one thing worthy of avoidance does not seem to be contrary to another, 5
unless the one is said to be so with respect to an excess and the other with respect to a deficiency; for excess seems to be among the things worthy of avoidance as, likewise, does deficiency. The remaining four, however, all produce contrariety. For doing good to friends is contrary to doing evil to friends; for it stems from the contrary character, 10
and the one is worthy of choice, the other of avoidance. It is the same way too in the case of the others; for in each pair, one is worthy of choice, the other of avoidance, and the one belongs to a decent character, the other to a base one.

It is clear, then, from what has been said that the same thing has more than one contrary; for to doing good to friends both doing good to enemies and doing evil 15
to friends are contraries. Similarly, if we look at the others in the same way, it will be evident that each has two contraries. Hence we must take whichever of the two contraries would be useful against the thesis proposed.

Further, if a coincident of a thing has a contrary, look to see whether it belongs to 20
the precise thing to which the coincident has been said to belong; for if the former belongs, the latter could not belong; for it is impossible for two contraries to belong to the same thing at the same time.

Or, if something has been said of something, look to see whether it is such that, if true, contraries must belong to the same thing—for example, if the opponent has said that the Forms are in us; for then it will follow that they are both moving 25
and resting, and further, both perceptible and intelligible. For those who posit the Forms believe that those Forms are at rest and intelligible.[42] But if they are in us, it is impossible for them to be unmoved; for when we move, necessarily everything that is in us moves along with us. And it is clear that they are also perceptible, if indeed 30
they are in us; for it is by means of the perceptual modality of sight that we know the shape [or form] present in each thing.

Again, if a coincident is proposed that has a contrary, look to see whether what is receptive of the contrary is precisely the thing that is also receptive of the coincident; for it is the same thing that is receptive of contraries.[43] For example, if the opponent has said that hatred follows anger, then hatred would be in the spirited part; for that is 35
where anger is. Look to see, then, if its contrary—loving—is also in the spirited part; for if it is not, but is in the appetitive part, hatred could not follow anger. Similarly, if **113ᵇ1**
he has said that the appetitive part is ignorant; for it would be receptive of scientific

42. *Met.* 987ª32–ᵇ8.
43. *Somn.* 453ᵇ27–31, *Met.* 1055ª29–30.

knowledge as well, if indeed it were also receptive of ignorance. But this is precisely what he does not believe, that the appetitive part is receptive of scientific knowledge.

When disestablishing, then, as was said,[44] this must be used. But when establishing that the coincident belongs this topic is not useful—although it is useful for establishing that it is possible for something to belong. For having proved that the thing is not receptive of the contrary, we will have proved that the coincident neither belongs nor can possibly belong. On the other hand, if we prove that the contrary belongs, or that the thing is receptive of the contrary, we will not yet have proved that the coincident also belongs, but rather our proof will have gone only this far: that it is possible that it belongs.

2.8
The Four Sorts of Opposition

Since opposites are of four sorts,[45] in the case of contradictory ones, look to see whether [arguments can be] based on reversing their sequence, both when doing away with things and when establishing them, obtaining it by induction. For example, if what is human is animal, what is not animal is not human. It is the same way in the other cases too. For there their sequence is reversed; for animal follows from human, but not-animal does not follow from not-human, but rather the reverse, not-human from not-animal. One must claim this, then, to be so in all cases—for example, if the noble is pleasant, the not pleasant is also not noble, and if the latter is not so, the former is not so either. Similarly, if the not pleasant is not noble, then the noble is pleasant. Clearly, then, reversing the sequence in the case of contradictories is convertible with an eye to both [establishing and disestablishing].

In the case of contraries, look to see whether contrary follows from contrary, either in the same sequence or in reverse, both when doing away with things and when establishing them, obtaining these too by induction, so far as is useful.[46] The sequence is the same in the case, for example, of courage and cowardice; for virtue follows along with the one and vice the other, and being worthy of choice follows the one and being worthy of avoidance the other. In the latter case again, the sequence is the same; for to being worthy of choice being worthy of avoidance is the contrary. It is the same too in the other cases. On the other hand, the sequence is reversed in such cases as this: health follows the good state, but disease does not follow the bad one, but rather the bad one follows disease. It is clear, then, that in these cases the **114ᵃ1** sequence is reversed. Reversal is rare in the case of contraries; in most of them, the sequence is the same. If, then, the sequence of one contrary and that of the other is neither the same nor reversed, it is clear that neither, in the case of the things stated,

44. 113ᵃ18–19.
45. *Met.* 1018ᵃ20–25.
46. Reading ἐφ᾽ ὅσον χρήσιμον.

does the sequence of one follow along with that of the other. But if in the case of the contraries they do so, then in the case of the things stated as well, it is necessary for that of one to follow along with that of the other.

One must look at cases of privation and having in the same way as contraries, except that in the case of privations there is no reverse. Instead, the sequences are of necessity always in the same direction, just as perception follows along with sight, but non-perception follows along with blindness. For perception is opposed to non-perception as having is to privation; for one of them is a having, and the other a privation.

One must treat cases of relatives in the same way as cases of having and privation;[47] for the sequence of these is in the same direction too. For example, if triple is a multiple, one third is a fraction; for something is said to be a triple relative to a third, and a multiple relative to a fraction. Again, if scientific knowledge is supposition, the scientifically knowable is also supposable; and if sight is a perceptual modality, what is visible is also perceptible. (Objection: There is no necessity, in the case of relatives, for the sequence to occur in the way stated; for the perceptible is scientifically knowable, but perception is not scientific knowledge. And yet the objection does not seem to be true; for many people deny that there is scientific knowledge of perceptible things.[48]) Further, the [topic] mentioned is no less useful for the contrary—for example, that the perceptible is not scientifically knowable; for perception is not scientific knowledge either.

2.9
Co-ordinates and Inflections

Again, look at the case of the co-ordinates and the inflections, both when doing away with things and when establishing them. Things such as the following, for example, are said to be co-ordinates: just things and the just person are co-ordinates of justice, and courageous things and the courageous person are co-ordinates of courage. Similarly, the things that produce something or that protect it are co-ordinates of what they produce or protect—for example, things conducive to health are co-ordinates of health, and things conducive to the good state are co-ordinates of the good state. And the same way in the case of the others. Things of this sort, then, are usually said to be co-ordinates, while things said to be inflections are, for example, justly, courageously, and healthily, and such as are said of things in that way. But inflections also seem to be co-ordinates—for example, justly seems to be a co-ordinate of justice, and courageously of courage. Indeed, all things said in the same column[49] are co-ordinates—for example, justice, just person, just thing, justly. Hence it is clear that when any one

47. Reading τῇ ἕξει καὶ τῇ στερήσει.
48. As Plato is thought to have done. See 113ᵃ27–28.
49. *Met.* 1054ᵇ35–1055ᵃ1, 1058ᵃ13–14.

member, whatever sort it is, that belongs in the same column, is proved to be good
114b1 or praiseworthy, then all the rest also come to be proved so—for example, if justice is something praiseworthy, then a just person, a just thing, and justly done are praiseworthy things. And things done justly will also be said to be done praiseworthily, by the same inflection deriving from praiseworthy as they are said to be justly done by
5 the one deriving from justice.

Look at the contrary not only in the case of the very thing mentioned, but also in the case of its contrary. For example, argue that the good is not necessarily pleasant; for the bad is not necessarily painful either; or that if the latter is the case, so is the former. Also, if justice is scientific knowledge, injustice is also ignorance; and if doing something justly is doing it scientifically and experiencedly, doing it unjustly is doing
10 it ignorantly and inexperiencedly. On the other hand, if the latter are not the case, neither are the former, as in the case of the one stated just now; for doing something unjustly would appear closer to doing it experiencedly than inexperiencedly. This topic was stated previously[50] in connection with the sequences of contraries; for all
15 we are claiming now is that contrary follows along with contrary.

Further, both when doing away with things and when establishing, look at comings to be and passings away, and at what produces things and what destroys them. For those things whose comings to be are good are themselves good, and if they themselves are good, their comings to be are also, but if their comings to be are bad, they themselves are also bad. In the case of passings away, however, it is the reverse;
20 for if the passings away are good, the things themselves are bad, but if the passings away are bad, the things themselves are good. And the same argument applies to what produces things and what destroys them; for things produced by good things are themselves good, but things destroyed by good things are themselves bad.

2.10
Similarity

Again, look at similar things to see whether they hold in a similar way—for example,
25 if one science is of several things, so is one belief; and if to have sight is to see, to have hearing is also to hear. It is the same way in the case of other things too, both in the case of those that are similar and of those that seem so. This topic is useful for both [establishing and disestablishing]; for if something holds in the case of one of the similar things, it also holds of the other similar ones, while if it does not hold in the case
30 of one, it does not hold in the case of the others either. Look to see too whether the thing holds in a similar way in one case as it does in many, since in some cases there is a discordance. For example, if to scientifically know something is to be thinking of it, to scientifically know many things is also to be thinking of many things. But this is

50. 113b27–114a6.

not true; for it is possible to scientifically know many things, but not to be thinking of them. If, then, this is not true, neither is the former, which says that in the case of one thing to scientifically know it is to be thinking of it.

Further, [argue] based on the more and less. There are four topics of the more and less.[51] The first consists in looking to see whether more follows along with more—for example, if pleasure is a good, whether more pleasure is also more good, and if doing injustice is bad, whether doing more injustice is more bad. This topic is useful for **115^{a}1** both [establishing and disestablishing]; for if an increase in the coincident follows along with an increase in the underlying subject, as in the examples stated, it is clear that it coincides with it, while if it does not follow along, it does not coincide. Get hold of this by induction. Another is when one F is said of two things. If F does not belong to the thing to which it is more likely to belong, it does not belong either to the thing to which it is less likely to belong; and if F belongs to the thing to which it is less likely to belong, it also belongs to the thing to which it is more likely to belong. Conversely: when two things (F and G) are said of one thing. If the one (F) that seems to belong to it more does not belong, neither does the one (G) that seems to belong to it less, and if G does belong, F does too. Further: when two things (F and G) are said of two things. If the one (F) that seems to belong more to the one thing does not belong, nor does the remaining one (G) belong to the remaining thing; and if the one that seems to belong less (G) to the one thing does belong, the remaining one (F) also belongs to the remaining thing.

Further, on the basis of F belonging or seeming to belong in a similar degree, [argue] in three ways, as in the case of the more, in the case of the last three topics mentioned. For if F belongs, or seems to belong, in a similar degree to two things, if it does not belong to the one thing, neither does it belong to the remaining thing. Or, if two things (F and G) belong in a similar degree to the same thing, if F does not belong neither does the remaining one (G), while if F does belong, the remaining one (G) does too. It is the same way too if two things (F and G) are said in a similar degree of two things; for if F does not belong to the one, neither does the remaining one (G) belong to the remaining one, while if F does belong to the one, the remaining one (G) does belong to the remaining one.

2.11
Addition and Unconditional versus Conditional Predications

On the basis of the more and less and of similarity, then, it is possible to argue dialectically in these many ways.

Further, it is possible to do so on the basis of addition. If one thing added to another makes it good or white, while the latter was not good or white before, then

51. Reading τοῦ μᾶλλον καὶ ἧττον.

what was added will be good or white—which is also precisely the quality it makes the whole possess. Further, if a thing added to what already possesses a quality makes it be possessed of more of that quality, then the thing itself will also possess it. It is the same way in other cases too. This topic is not useful in all cases, however, but rather in those in which exceeding with respect to more[52] is found to occur. And this topic is not convertible for the purposes of disestablishing. For if what is added does not make the thing good, it is not yet clear whether it itself is not good; for the addition of good to bad does not of necessity make the whole good, nor that of white to black.

Again, if F is said of things more and less, it also unconditionally belongs to them; for things that are not good or white will not be said to be more or less good or white; for a bad thing will never be said to be more or less good but rather more or less bad. This topic too is not convertible for the purposes of disestablishing; for many things that are not said of things more and less[53] do unconditionally belong to them; for someone is not said to be more or less human, but he is not, because of this, not human at all.

In the same way, also look at: in some respect, when, and where; for if a thing is possible in some respect, it is also unconditionally possible. It is the same way with when and where; for what is unconditionally impossible is not possible either in some respect or at some place or time. (Objection: There are people who are in some respect excellent by nature, for example, generous or temperate, who are not unconditionally excellent by nature. Similarly, it is possible for something that admits of passing away not to pass away at a given time, but it is not possible for it unconditionally not to pass away. In the same way too, it is advantageous in some places to follow such-and-such a diet, for example, in pestilential places, but not unconditionally advantageous to follow it. Further, in certain places it is possible for there to be one person, but it is not unconditionally possible for there to be only one person. In the same way too, it is noble in some places to sacrifice one's father, for example, among the Triballi, but it is not unconditionally noble. Or this may signify a relation not to place but to persons; for it makes no difference where they may be; for wherever they are it will be noble for them, since they are Triballi.[54] Again, at certain times it is advantageous to take medicine, for example, when one is sick, but it is not unconditionally so. Or this may signify a relation not to a certain time, but to being in a certain condition; for it makes no difference when he takes it, provided he is in that condition.) What is unconditionally so, however, is what, without any addition, one will say is noble or the contrary—for example, one will not say that it is noble to sacrifice one's father, but rather that for some people it is noble, but not therefore unconditionally noble, while, one will say, with no addition, that to honor the gods is noble; therefore, it is

52. I.e., where, as a result of an addition, the F thing becomes yet more excessively F than before the addition.

53. Reading καὶ ἧττον.

54. Reading οὖσι Τριβαλλοῖς.

unconditionally noble. So whatever, with no addition whatever, seems to be noble or shameful of anything else of that sort, will be said to be unconditionally so.

BOOK 3

116^{a}1

3.1[55]
Relative Choiceworthiness (1)

As for which of two or more things is more choiceworthy or better, look at it on the basis of the following. First, determine that the investigation being made is not into things that are very far apart from each other, or exhibit great difference from each other (for no one raises any puzzles about whether happiness or wealth is more choiceworthy), but into things that are quite close, and about which we dispute as to which we must side with more, because we see no point of superiority of one relative to the other. Clearly, then, in cases of this sort, if one point of superiority can be proved, or more than one, our thought will entirely agree that this is the more choiceworthy, whichever of the two is superior.

First, then, what is longer lasting or more stable is more choiceworthy than what is less so. Also, what the practically wise person or the good man would choose more than other things; or what the correct law would; or people excellent in particular areas, when they make their choice insofar as they are such; or those with scientific knowledge in a given kind,[56] either all of them or most of them—for example, in medicine, or in building, most or all doctors [or builders]; or, in general, what most people, or all of them, or all things would choose—for example, the good; for all things aim at the good. And one must lead the discussion toward whichever of these would be useful. And what is unconditionally better or more choiceworthy is what is in accord with the better science, but what is better or more choiceworthy for a certain thing is what is in accord with the science proper to it.[57]

Next, what is precisely a this something is better or more choiceworthy than what is not in the kind—for example, justice than a just person; for the one is in the kind of the good,[58] while the other is not, and the one is precisely good[59] and the other is not. For nothing is said to be precisely the kind that is not in the kind—for example, pale human is not precisely color. It is the same way in the other cases too.

Also, what is choiceworthy because of itself is more choiceworthy than what is choiceworthy because of something else—for example, being healthy than athletic

55. Many of the topics discussed in these chapters are also discussed in *Rh*. 1.7.
56. Reading ἢ οἱ ἐν ἑκάστῳ γένει ἐπιστήμονες.
57. *Met*. 1026^{a}18–23, 1064^{b}3–6.
58. Reading τῷ ἀγαθῷ.
59. *APo*. 83^{a}24–32.

30 training; for the former is choiceworthy because of itself, the latter because of something else. Also, what is intrinsically choiceworthy is more choiceworthy than what is coincidentally so—for example, that one's friends be just than that one's enemies be just. For the former is intrinsically choiceworthy, the latter coincidentally so; for we coincidentally choose our enemies to be just, in order that they do us no harm. This
35 [topic] is the same as the one before it, with a difference in mode; for we choose that our friends be just because of itself, even if nothing will come to us at all, and even if they may be in India,[60] while we choose that our enemies be so because of something else, that is, in order that they do us no harm.

Also, the intrinsic cause[61] of a good thing is more choiceworthy than its coinci-
116b1 dental cause—for example, virtue than luck (for the former is intrinsically, and the latter coincidentally, a cause of good things), and so with anything else of this sort. Similarly, in the case of the contrary; for what is intrinsically the cause of a bad thing
5 is more to be avoided than what is so coincidentally—for example, vice than luck; for the former is intrinsically the cause, while luck is coincidentally so.

Also, what is unconditionally good is more choiceworthy than what is good for a certain thing or person—for example, becoming healthy than having surgery; for the former is unconditionally good, the latter only for a certain person, the one who needs surgery. Also, what is good by nature is more choiceworthy than what is not
10 good by nature—for example, justice than the just person; for the one is good by nature, while the other's good is something acquired. Also, what belongs to what is better and more estimable is more choiceworthy—for example, to a god than to a human, and to a soul than to a body.

Also, what is special to the better is better than what is special to the worse—for example, to the god than to the human; for with respect to the common ones in both
15 they do not differ at all from each other, but it is in what is special that the one is superior to the other. Also, what resides in better things, prior ones, or more estimable ones is better—for example, health than strength or beauty; for health resides in moist things and dry ones, hot ones and cold ones, and (simply speaking) in all the primary constituents from which a living being is composed, while the others reside
20 in posterior ones. For strength resides in the sinews and bones, while beauty seems to be a sort of symmetry of the limbs.

Also, the end seems to be more choiceworthy than what furthers the end, and of two things that do so, the one that is closer to the end. Also, in general, what furthers the end of life is more choiceworthy that what furthers some other end—for exam-
25 ple, what tends to further happiness than what tends to further practical wisdom. Also, what is possible is more choiceworthy than what is impossible.

Further, of two productive factors, the one whose end is better is more choiceworthy, while of a productive factor and an end, it is based on a proportion: when

60. I.e., too far away to affect us in any way. See *EE* 1226a30–32.
61. *Ph.* 196b25–27.

the superiority of one end over the other is greater than that of the latter over its own productive factor (for example, if happiness is more superior to health than health is to what conduces to health), then what is productive of happiness is superior to health. For what is productive of happiness is as superior to what conduces to health as happiness is to health. But it is assumed that health is less superior to what conduces to health; so what is productive of happiness is more superior to what conduces to health than health is to what conduces to health. It is clear, then, that what is productive of happiness is more choiceworthy than health, since its superiority to the same thing is greater.

Further, what is intrinsically more beautiful, more estimable, and more praiseworthy is more choiceworthy—for example, friendship than wealth, justice than strength; for the former are intrinsically estimable and praiseworthy, while the latter are not intrinsically so, but rather because of something else. For no one honors wealth because of itself, but rather because of something else, but friendship is honored intrinsically, even if nothing else will come to us from it. **117^{a}1**

3.2
Relative Choiceworthiness (2)

Further, when two things are much the same as each other and we cannot see any point of superiority in the one over the other, one must look at them from their consequences. For the one that is followed by the greater good is more choiceworthy; or, if the consequences are bad, the one that is followed by less evil is more choiceworthy; for, though both are choiceworthy, there is nothing to prevent some disagreeable consequence from following. The investigation stemming from things that follow, however, is twofold; for what follows can be either prior or posterior—for example, for the person who learns, being ignorant is prior, being scientifically knowledgeable posterior. For the most part, the posterior consequence is better.[62] One must take, then, whichever of the consequences is useful [dialectically].

Further, a greater number of goods is more choiceworthy than a smaller, either unconditionally or when the one is included in the other, that is, the smaller number in the greater.[63] (Objection: Unless perhaps one is for the sake of the other; for then the two together are not more choiceworthy than the one—for example, becoming healthy plus health than health, since we choose to become healthy for the sake of health. And there is nothing to prevent things that are not [all] good from being more choiceworthy than things that are [all] good—for example, happiness plus another thing that is not good than justice plus courage.) Also, the same things with pleasure

62. I.e., a better good, not better for dialectical purposes.
63. *NE* 1097^{b}15–20, *Rh*. 1363^{b}18–21.

are more choiceworthy than without pleasure. Also, the same things with absence of pain than with pain.

Also, each thing, when its capacity is greater, is at the same time more choiceworthy—for example, absence of pain in old age more than in youth; for its capacity is greater in old age. In line with the same reasoning, practical wisdom is more choiceworthy in old age; for no one chooses young people as leaders, because they do not expect them to be practically wise. With courage, it is the reverse; for it is in youth that activity in accord with courage is most necessary. It is the same way with temperance; for young people are more troubled by their appetites than older ones.

Also, what is more useful at all, or at most, times is more choiceworthy—for example, justice and temperance than courage; for they are always useful, while courage is useful [only] at times.[64] Also, of two things, the one whose possession by all implies that we do not need the other is more choiceworthy than the one whose possession implies that we still need the remaining one in addition, as in the case of justice and courage; for if all were just, courage would be of no use, but if all were courageous, justice would still be useful.

Further, [argue] on the basis of the passings away and losses, the comings to be and acquisitions, and the contraries of things; for things whose passings away are more to be avoided are themselves more choiceworthy. It is the same way in the case of the losses and contraries of things; for a thing whose loss or contrary is more to be avoided is itself more choiceworthy. On the other hand, in the case of comings to be and acquisitions, it is the reverse; for things whose acquisition or coming to be is more choiceworthy are themselves more choiceworthy.

Another topic: What is closer to the good is better and more choiceworthy. Also, what is more similar to the good—for example, justice is better and more choiceworthy than a just person. Also, of two things compared, what is more similar to a better [third one], as Ajax is better than Odysseus, because he is more like Achilles. (Objection that this is not true: For nothing prevents the respects in which Achilles is best from not being the ones in which Ajax is more similar to him, while Odysseus is good though not similar to Achilles. Look to see too whether the similarity is more in the direction of caricature, like the similarity of a monkey to a human being, while a horse is not similar; for the monkey is not more beautiful, though it is more similar to a human.)

Again, of two things, if one is more similar to the better and the other more similar to the worse, the one that is more similar to the better is better. (But this admits of objection too: For nothing prevents one thing from being slightly similar to the better, while the other is strongly similar to the worse—for example, if the similarity of Ajax to Achilles is slight, while that of Odysseus to Nestor is strong. It also admits of objection, if what resembles the better were to resemble it in the direction of the

64. *Pol.* 1334a22–34.

worse, while what resembles the worse does so in the direction of the better, as in the similarity of a horse to a donkey and of a monkey to a human.)

Another [topic]: What is more remarkable is more choiceworthy than what is less so, as is what is more difficult; for we like better having things that are not easy to get. Also, what is more special than what is more commonly shared. Also, what is less commonly shared with bad people.

Further, if this is unconditionally better than that, then the best in this is better than the best in the other—for example, if human is better than horse, the best human is also better than the best horse. Also, if the best in the one is better than the best in the other, then the one is also unconditionally better than the other—for example, if the best human is better than the best horse, then human is unconditionally better than horse.

Further, things that our friends can share are more choiceworthy than those they cannot. Also, things that we would choose to do to a friend more than to a random person are more choiceworthy—for example, doing justice and doing good more than seeming to do them; for we choose to do good to friends more than to seem to do them, while to random people it is the reverse.

Also, what depends on abundance is better than what is necessary, and sometimes also more choiceworthy; for living well is better than living, and living well depends on abundance, while life itself is a necessity. But sometimes what is better is not also more choiceworthy; for it is not the case that if something is better, it is necessarily more choiceworthy; at any rate, to do philosophy is more choiceworthy than to make money,[65] but it is not more choiceworthy for one in need of the necessities. But what depends on abundance is so when, having the necessities, one procures other things that are noble in addition. Roughly speaking, what is necessary is perhaps more choiceworthy, but what depends on abundance is better.

Also, what cannot be procured from another is more choiceworthy than what can also be procured from another, as is the case with justice as compared to courage.[66] Also, if this is choiceworthy without that, but not that without this, [the former is more choiceworthy]—for example, capacity is not choiceworthy without practical wisdom, but practical wisdom is choiceworthy without capacity. Also, if we renounce one of two things in order that the remaining one seems to belong to us, then the one we wish to seem to belong to us is more choiceworthy—for example, we renounce the love of labor in order that we seem to be naturally clever.

Further, what it is less criticizable for people to be annoyed at the absence of is more choiceworthy; also what it is more criticizable for people not to be annoyed at the absence of is more choiceworthy.

65. *NE* 1177^{a}25–26, *Pol.* 1259^{a}16–18.

66. E.g., courageous bodyguards can play many of the roles of one's own courage, but justice is something one must have oneself.

3.3
Relative Choiceworthiness (3)

Further, of things that fall under the same form, the one that has the virtue proper to the form is more choiceworthy than the one that does not have it, and if both have it, the one that has it to a higher degree.

Further, if one thing makes good what it is present in, while another does not, the one that makes it good is more choiceworthy, as too what warms is warmer than what does not. And if both make it good, the one that makes it good to a higher degree, or that makes the better and more controlling thing good, is more choiceworthy—for example, if the one makes the soul good, the other the body.

Further, [determine their relative choiceworthiness] from their inflections, uses, actions, and works, and the latter from the former; for they follow along with each other. For example, if justly done is more choiceworthy than courageously done, justice is more choiceworthy than courage; and if justice is more choiceworthy than courage, justly done is more so than courageously done. And it is much the same way in the other cases too.

Further, if one is a greater and the other a lesser good than the same [third] thing, or if one is greater than a greater good, the greater is more choiceworthy. But, again, if there are two things that are both more choiceworthy than something, the one that is so to a higher degree would be more choiceworthy than the one that is so to a lesser degree. Further, if the excess of one thing is more choiceworthy than the excess of another, the one is more choiceworthy than the other—for example, friendship than wealth; for an excess of friendship is more choiceworthy than an excess of wealth. Also, what a person would wish to be himself the cause of for himself more than that for which [he would wish] someone else [to be the cause] is more choiceworthy—for example, friends than wealth.

Further, [argue] on the basis of an addition, looking to see whether [of two things] added to the same [third] thing, one makes the whole more choiceworthy [than the other]. But one must watch out for proposing a case in which the common thing uses, or in some other way works together with, one of the things added to it, but does not use or work together with the remaining one—for example, a saw or a sickle together with the craft of carpentry; for in their combination the saw is more choiceworthy, but it is not unconditionally more choiceworthy. Again, [one thing is more choiceworthy than another] if, when added to the lesser of two [other] things, it makes the whole greater [than the addition of the other to the greater of them]. Similarly, [one may argue] on the basis of subtraction; for a thing whose subtraction from the same thing makes the remainder a lesser [good than the subtraction of the other] would be greater, whichever one it is whose subtraction makes the remainder a lesser one.

Also, [look to see] whether one thing is choiceworthy because of itself and the other because of the reputation it brings[, since the former is more choiceworthy]—for

example, health than beauty. And the defining mark of reputation is that if no one else knew about it, one would not be eager to have it. Also, it is more choiceworthy if it is so both because of itself and because of its reputation, while the other is so because of only one of the two. Also, whichever is more estimable because of itself is also better and more choiceworthy. A thing would be more estimable because of itself [than another thing] if we would choose it more for its intrinsic self [than that other thing], when we are going to have nothing else because of it.

Further, determine in how many ways things are said to be choiceworthy and for the sake of what—for example, the advantageous, the noble, or the pleasant; for what is useful in furthering all or furthering most of them would be more choiceworthy, provided they are so to a similar degree. And if the same things belong to both, look to see which they belong to more, that is, which is more pleasant, more noble, or more advantageous. Again, what is for the sake of a better thing is more choiceworthy—for example, for the sake of virtue than of pleasure. It is the same way too in the case of things to be avoided; for what more impedes what is choiceworthy is more to be avoided—for example, illness than ugliness; for both to pleasure and to excellence disease is a greater hindrance.

Further, [argue] on the basis of proving that the thing proposed is equally worthy of avoidance and choice. For the sort of thing that one would equally both choose and avoid is less choiceworthy than another that is choiceworthy only.

3.4
Unconditional Choiceworthiness

Comparisons of things with each other must be made, then, in the way stated. But the same topics are also useful for proving that something is [unconditionally] worthy of choice or avoidance; for we need only subtract the excess of one thing over another. For if what is more estimable is more desirable, what is estimable is desirable, and if what is more useful is more choiceworthy, what is useful is choiceworthy, and it is the same way too in the case of other things of the sort that admit of comparison. For in some cases, while comparing one thing with another, we from the outset state too that each of the two things is choiceworthy, or that one of the two is—for example, when we state that the one is good by nature and the other not by nature; for it is clear that what is good by nature is choiceworthy. **119^{a}1**

3.5
More and Greater

The topics concerned with the more and the greater must be taken in their most universal version; for, when so taken, they would be useful for a larger number of

cases. It is possible to make some of the ones mentioned more universal by a slight alteration in their formulation. For example: what is by nature F is more F than what is F not by nature. Also, if one thing makes something that has it, or that it belongs to, F, and another does not, the one that makes it F is more F than the one that does not make it F; and if both make it F, the one that makes it more F.

Further, if one thing is more F and another less F than the same [third] thing, and also, if one thing is more F than a [third] thing that is F, and another is more F than a [fourth] thing that is not F, it is clear that the first is more F. Further, [argue] on the basis of addition, looking to see whether the addition of one to the same thing makes the whole more F [than the addition of the other], or if when added to what is less F, it makes the whole more F. Similarly, [argue] on the basis of subtraction; for a thing whose subtraction makes the remainder less F is itself more F. Also, things that have less of an admixture of the contrary of F are more F—for example, a thing is whiter that has less of an admixture of black.

Further, beyond what was said previously, something that more admits of the account proper to the F proposed [is more F]—for example, if the account of white is "color that dilates sight,"[67] what is more of a color that dilates sight is whiter.

3.6
Particular Predications

If a problem is posed in a particular and not in a universal version, the first universal topics mentioned for establishing or disestablishing are all useful.[68] For when doing away with or establishing something universally, we also prove it in particular; for if it belongs to all, it also belongs to some, and if to none, it does not belong to one either. The topics that are most handy and common are those based on opposites, co-ordinates, and inflections.[69]

For the claim that if all pleasure is good, all pain is also bad, and the claim that if some pleasure is good, some pain is also bad, are similarly acceptable beliefs.[70]
119b1 Further, if some perception is not a capacity, some non-perception is not a lack of capacity. And if something supposable is scientifically knowable, some supposition is scientific knowledge.[71] Again, if some unjustly done thing is good, some unjust thing

67. 107b29–30.
68. The reference could be to the topics in 2.2–3.5, all of which deal with universally quantified problems, even if the quantifier is not always made explicit. The use of *koinoi* ("common") at 119a37, though, seems to further restrict the reference to topics that are not just universally quantified but also common, that is, usable in dealing with a problem regardless of its subject matter. This would limit the relevant topics to those in 2.2–11.
69. 2.9.
70. The opposites are contraries.
71. The opposites are relatives.

is good. Also, if something pleasantly done is to be avoided, some pleasure is to be avoided. In line with the same reasoning, if something pleasant is beneficial, some pleasure is good.

Also, in the case of what destroys, and of comings to be and passings away, it is the same way. For if something that destroys pleasure or scientific knowledge is good, some pleasure or some scientific knowledge would be bad. Similarly, if some passing away of scientific knowledge is good or some coming to be of it is bad, some scientific knowledge will be bad—for example, if someone's forgetting the shameful things he has done is something good, or remembering them something bad, to know scientifically the bad things he has done would be something bad. It is the same too in the other cases; for what is an acceptable belief is similarly so in all of them.

Further, [argue] on the basis of the more and the less and the similar. For if something in another kind is more F [than the thing mentioned in the problem], and nothing in its kind is F at all, the thing mentioned could not be F either—for example, if some science is more of a good than pleasure, while no science is a good at all, pleasure would not be a good either. Also, on the basis of the similar or the less [argue] in the same way; for it will be possible both to do away with things and to establish them, except that, while both are possible on the basis of similarity, on the basis of the less it is possible only to establish things, not to disestablish them. For if some capacity and some science are similarly good, and some capacity is good, some science is good too, and if no capacity is good, no science is either. On the other hand, if some capacity is less good than a science, and some capacity is good, a science is also good. But if no capacity is good, it is not necessary that no science be good either. It is clear, then, that only establishing is possible on the basis of the less.

It is possible to disestablish things not only on the basis of another kind, but also on the basis of the same one, by taking a case that is most of all F—for example, if it is proposed that some science is good, and if it were to be proved that practical wisdom is not good, no other science will be good either, since not even the one that is most of all believed to be good is good. Further, [argue] on the basis of a hypothesis, claiming similarly that if F belongs (or does not belong) to one, it belongs (or does not belong) to all—for example, if the soul of a human is immortal, the other souls are too, but if it is not, neither are the others. If, then, it is proposed that F belongs to some [members of a kind], it must be proved that it does not belong to some; for it will follow because of the hypothesis that it belongs to none at all. But if it is proposed that F does not belong to any, it must be proved that it belongs to some; for it will also follow in this way that it belongs to all. It is clear that the one **120^{a}1** responsible for the hypothesis makes the problem universal, though it was proposed in a particular version; for he claims that one who agrees to it in a particular version must also agree to it in a universal one, since if F belongs to one case, he claims that it belongs to all alike.

When the problem is indeterminate,[72] it is possible to do away with things in only one way—for example, if the opponent has said that some pleasure is good or is not good, and has not made it further determinate in any other way. For if he said that some pleasure is good, it must be proved universally that none is, if the thing proposed is going to be done away with. Similarly, if he said that some pleasure is not good, it must be proved universally that all are. It is not possible to do away with it in any other way; for if we prove that some pleasure is not good or is good, we will not yet have done away with the thing proposed. It is clear, then, that it is possible to do away with a premise of this sort in only one way, but possible to establish it in two ways; for whether we prove universally that all pleasure is good or prove that some pleasure is good, the thing proposed will have been proved. Similarly, when we must argue dialectically that some pleasure is not good, if we prove that no pleasure is good or that some pleasure is not good, we will have argued dialectically in two ways, both universally and in particular, that some pleasure is not good.

If, on the other hand, the thesis is determinate, it will be possible to do away with it in two ways—for example, if it consists in positing that it belongs to some pleasure to be good and does not belong to some pleasure to be good; for whether it is proved that all pleasure is good or that none is good, the thing proposed is done away with. And if what the opponent has posited is that only one single pleasure is good, it is possible to do away with it in three ways; for by proving that all, no, or more than one pleasure is good, we will have done away with the thing proposed. And if the thesis is made still more determinate (for example, if it consists in positing that practical wisdom alone of the virtues is scientific knowledge), it is possible to do away with it in four ways; for if it has been proved that all virtue is scientific knowledge, that none is, that some other virtue (for example, justice) is too, or that practical wisdom itself is not scientific knowledge, the thing proposed will have been done away with.

It is also useful to look at the particular instances, in cases where F has been said to belong or not to belong, just as in the cases of universal problems. Further, one must look among the kinds, dividing them by their forms until one reaches the indivisible ones, as was said previously;[73] for whether F were to appear to belong in all cases or in none, after introducing many instances, one must claim that the opponent must either agree to the universal or bring an objection showing in what case it does not hold. Further, in cases in which it is possible to determine the coincident either by

72. Usually a premise is indeterminate if it has no explicit quantifier (no "all" or "some") (*APr*. 24ª17–22). But that this cannot be the meaning here is shown by the examples of determinate problems at 120ª20–31. The indeterminate problem or premise is "some things are F," which is indeterminate in being refutable in only one way, by proving that all things are not-F (120ª6–10). *Level 1* of determination is some are F and some are not F (120ª20–24), which, as more determinate, is refutable in two ways (120ª21). *Level 2* is only one single thing is F (120ª24–27), which, as more determinate still, is refutable in three ways (120ª25). *Level 3* is only this specific thing is F (120ª27–28), which, as yet more determinate, is refutable in four ways (120ª28).

73. 109ᵇ15–16.

form or by number, look to see whether none of them belongs—arguing, for example, that time is not moved and that it is not a movement either,[74] by enumerating how many forms of movement there are; for if none of these belongs to time, it is **120^{b}1** clear that it is not moved, nor is it a movement. Similarly, [argue] that the soul is not a number by determining that all number is either odd or even; for if the soul is neither odd nor even, it is clear that it is not a number. 5

As regards the coincident, then, one must argue dialectically by means of these and in such a way.

BOOK 4 10

4.1
Kinds, Forms, and Special Affections

Next we must investigate the [topics] related to kind and special affection. These are elements of the topics related to definitions, but the investigations of those practicing dialectic are seldom concerned with these by themselves.

If, then, some kind is proposed for some of the beings, first look at all the beings 15 akin to the one mentioned, to see whether the kind is not predicated of some of them, just as in the case of a coincident.[75] For example, if good is proposed as the kind of pleasure, see whether some pleasure is not good; for if this is so, it is clear that good is not the kind of pleasure; for the kind is predicated of everything falling under the same form. Next, look to see whether it is predicated not in the what-it-is 20 but as a coincident, as white is predicated of snow or self-moved of soul. For snow is not precisely white, which is why white is not the kind of snow, nor is soul precisely what is moving; rather, its being moved is coincidental to it, just as it often is of the animal to walk or to be walking.[76] Further, "moving" does not seem to signify what a 25 thing is but something it does or has done to it. It is the same way with "white"; for it does not indicate what snow is, but rather some quality of it. So neither of them is predicated in the what-it-is, while the kind is predicated in the what-it-is.[77]

Most of all, look at the definition of coincident to see whether it fits the stated 30 kind, as is also the case in the ones just mentioned; for it is possible for a thing to

74. *Ph.* 218^{b}9–20.
75. 109^{b}13–29.
76. Some animals (for example, human beings) have walking as their natural sort of spatial movement. For them to walk is not a coincident, though it is a coincident for them to be walking at any given moment. For other animals (for example, fish) walking is always a coincident, since though they might use their fins (as seals use their flippers) to get around on land, the sort of spatial movement natural to them is swimming, not walking.
77. Reading τὸ δὲ γένος ἐν τῷ τί ἐστι κατηγορεῖται.

move itself[78] and not to do so, and possible, similarly, for it to be white and not to be white. So neither of these is a kind but rather a coincident, since we said[79] that a coincident is what admits of belonging to a subject and of not belonging to it.

Further, look to see whether the kind and form are not in the same division, but rather that the one is substance and the other quality, or the one relative and the other quality. For example, snow and swan are each substance, while white is not substance but quality, so that white is not the kind either of snow or of swan. Again, scientific knowledge is among the relatives,[80] while good and noble are each a quality, so that good, or noble, is not the kind of scientific knowledge; for the kinds of relatives must themselves also be relatives, as in the case of double; for in fact multiple, which is the kind of double, is itself also a relative. To speak in universal terms, the kind must fall under the same division as its form; for if the form is substance, the kind is also, and if the form is quality, the kind is also quality—for example, if white is quality, color is too. It is the same way in the other cases too.

Again, look to see whether it is necessary or possible for the kind to participate in what has been put in the kind. And the definition of participate is "admit of the account of what is participated in." It is clear, then, that the forms participate in the kinds, but not the kinds in the forms; for the form admits of the account of the kind, but not the kind of the account of the form. One must look to see, then, whether the assigned kind participates, or admits of participating, in the form—for example, if someone were to assign something as the kind of being (*to on*) or of one; for it will follow that the kind participates in the form; for being and one are predicated of all beings, so that their account is as well.

Further, look to see whether there is something of which the assigned form is truly predicated although the kind is not—for example, whether what is (*to on*) or what is scientifically knowable is posited as the kind of the believable. For believable will be predicated of what is not (*to mê on*) (for many things that are not are believable), but it is clear that what is and what is scientifically knowable is not predicated of what is not. So neither what is nor what is scientifically knowable is the kind of the believable; for what the form is predicated of, the kind is predicated of as well.

Again, look to see whether what is put in the kind admits of participating in none of its forms; for it is impossible for it to participate in the kind if it participates in none of its forms, unless it just is one of the forms reached at the first division,[81] which do participate in the kind alone. If, then, movement is posited as the kind of pleasure,[82] one must look to see whether pleasure is neither spatial movement nor

78. Reading κινεῖν τι αὐτὸ ἑαυτό.
79. 102ᵇ6–7.
80. *Cat.* 11ᵃ24–32.
81. Unlike at 120ᵇ36, a division here is a division of a kind into forms. If the first division of the kind of animals was into mammals, birds, and fish, each of these would participate in the kind alone, without participating in any of its forms.
82. Plato, *Republic* 583e, *Philebus* 48d.

alteration nor any of the rest of the sorts of movement assigned to things. For then it would be clear that it participated in none of the forms, and so not in the kind either, since it is necessary for what participates in the kind also to participate in some of the forms. So pleasure could not be a form of movement, nor could it be any of the individuals that fall under the form of movement for the beings; for the individuals also participate in the kind and the form—for example, the individual human participates both in human and in animal.

Further, look to see whether the extension of what is put in the kind is wider than that of the kind—for example, as that of what is believable is wider than that of what is; for both what is and what is not are believable, so that what is believable could not be a form of what is; for the extension of the kind is always wider than that of the form. Again, look to see whether the form and the kind have the same extension—for example, if of what follows along with everything, as being and one do, one were posited as form, another as kind; for everything is a being and one, so that neither is the kind of the other, since they have the same extension. It is the same way too if first and starting-point were subordinate one to the other; for the starting-point is first and the first is starting-point, so that either both of the things mentioned are the same or neither is the kind of the other. An element [or topic] relevant to all cases of this sort is that the extension of the kind is wider than that of the form and its difference; for the extension of the difference is also narrower than that of the kind.

See also whether of something, among the things that do not differ in form, the stated kind is not the kind, or does not seem to be the kind—or, if establishing, whether it is the kind of one of them. For the kind of all things that do not differ in form is the same. If, then, it is proved to be the kind of one, it is clear that it is the kind of all, and if not of one, it is clear that it is the kind of none. For example, if someone positing indivisible lines[83] were to say that the indivisible is their kind; for of lines that admit of division, the one mentioned is not the kind, and these do not differ in form from indivisible ones; for all straight lines are no different in form from each other.

4.2
Kinds, Forms, and Differences

Look to see too whether there is any other kind of the assigned form which neither encompasses the assigned kind nor falls under it. For example, if someone were to posit that scientific knowledge is the kind of justice; for virtue is also its kind, and neither of the kinds encompasses the remaining one. So scientific knowledge could not be the kind of justice; for it seems that when one form falls under two kinds,

83. $108^{b}30–31$.

one encompasses the other.[84] But some cases of this sort involve a puzzle; for it seems to some people that practical wisdom is a virtue and also a science, and neither of these kinds is encompassed by the other. Of course, not everyone would concede that practical wisdom is scientific knowledge. If, however, someone were to concede the truth of the affirmation, still for one to fall under the other, or else for both to fall under the same kind, would seem necessary, just as actually happens in the case of virtue and scientific knowledge; for they both fall under the same kind; for each of them is a state and a disposition.[85] Look to see, then, whether neither of these belongs to the assigned kind. For if it is neither the case that one of the kinds falls under the other, or the other under the one, nor that both fall under the same kind, then the assigned one could not be the kind.

Look too at the kind of the assigned kind, and in this way always at the kind above, to see whether they are all predicated of the form, and predicated in the what-it-is; for all the higher kinds[86] must be predicated of the form in the what-it-is. If, then, there is a discordance anywhere, it is clear that what was assigned is not the kind. Again, look to see whether the kind, either itself or one of the higher kinds, participates in the form; for the higher kind participates in none of the lower ones. For disestablishing, then, it must be used in the way stated.

For establishing, on the other hand, if the stated kind is agreed to belong to the form, but that it belongs as kind is disputed, it is enough to prove that one of the higher kinds is predicated of the form in the what-it-is. For if one is predicated in the what-it-is, all of them, both higher and lower ones (if indeed they are predicated), will be predicated in the what-it-is. So the assigned kind too will be predicated in the what-it-is. But the fact that if one kind is predicated in the what-it-is, all the rest as well (if indeed they are predicated) will be predicated in the what-it-is, must be got hold of by induction. But if it is disputed whether the assigned kind belongs at all, it is not enough to prove that one of the higher kinds is predicated in the what-it-is. For example, if someone has assigned spatial movement as the kind of walking, in order to have proved that walking is spatial movement, it is not enough to have proved that it is movement, since there are also other forms of movement. Instead, it must be further proved that walking participates in no other forms in the same division as spatial movement; for what participates in the kind must of necessity also participate in one of the forms in the first division of it. If, then, walking participates neither in increase nor decrease, nor in any of the other forms of movement, it is clear that it would participate in spatial movement, so that spatial movement would be the kind of walking.

84. Aristotle acknowledges that this simple rule of kind subordination may admit of exceptions in certain cases. But that does not mean that it cannot be used in dialectical argument, since the problem under discussion may not be one of those cases. See 122ᵇ1–6.

85. *Cat.* 8ᵇ26–28, *Met.* 1022ᵇ10–11.

86. Reading πάντα γὰρ τὰ ἐπάνω γένη.

Again, in cases in which the posited form is predicated as kind, look to see whether the assigned kind too is predicated in the what-it-is of precisely the things of which the form is predicated, and similarly whether all the kinds higher than this kind are so predicated as well. For if there is a discordance anywhere, it is clear that what is assigned is not the kind; for if it were the kind, all the higher kinds, and it itself, would have been predicated in the what-it-is of precisely the things of which the form too is predicated in the what-it-is. For disestablishing, then, it is useful to see whether the kind is not predicated in the what-it-is of just the things of which the form too is predicated.

For establishing, on the other hand, it is useful to see whether the kind is predicated in the what-it-is. For then it will follow that the kind and the form are predicated in **122^{b}1** the what-it-is of the same thing, so that the same thing falls under two kinds. It is necessary, then, for one of the kinds to fall under the other. If, then, it were proved that the one we wish to establish as kind does not fall under the form, it is clear that the form would fall under it, so that it would have been proved that ours is the kind.

Look also at the accounts of the kinds to see whether they apply both to the assigned form and to the participants in the form; for it is necessary for the accounts of the kinds to be predicated of the form and also of the participants in the form. If, then, there is a discordance anywhere, it is clear that what is assigned is not the kind.

Again, look to see whether the opponent has assigned a difference as kind—for example, immortal as kind of god; for immortal is a difference of living things, since of the living things, some are mortal, others immortal. It is clear, then, that an error has been made; for a difference is not a kind of anything. And that this is true is clear; for no difference signifies a what-it-is but rather a quality, as do "terrestrial" and "two-footed."

Also, look to see whether the opponent has put the difference in the kind—for example, saying that odd is precisely number; for odd is a difference of number, not a form. Neither, it seems, does the difference participate in the kind; for everything that participates in the kind is either a form or an individual, but the difference is neither a form nor an individual. It is clear, then, that the difference does not participate in the kind. So neither could odd be a form, since it does not participate in the kind.

Further, look to see whether the opponent has put the kind into the form—for example, saying that contact is just continuity, or that a mixture is just a blend, or—in accord with Plato's definition[87]—that spatial movement is just movement with respect to place. For contact is not necessarily continuity, but rather the reverse: continuity is necessarily contact; for what is making contact with something is not always conjoined with it, while what is conjoined with something is always making contact with it. It is the same way in the case of the rest as well; for not all mixture is a blend (for a mixture of dry things is not a blend), nor is all movement with respect to place spatial movement; for walking does not seem to be spatial movement; for

87. *Theaetetus* 181d, *Parmenides* 138b–c.

pretty much [only] things that change one place for another non-voluntarily[88]—as happens in the case of inanimate things—are said to be in spatial movement. It is clear too that the extension of the form is wider than that of the kind in the given cases, but it must be the reverse.

Again, look to see whether the opponent has put the difference into the form—for example, saying that what is immortal is precisely god. For it will follow that the form has the same extension or a wider one. But the difference always[89] has the same extension as the form, or a wider one. Further, look to see whether he has put the kind into the difference—for example, saying that color is precisely contracting[90] or number precisely odd. Also, look to see whether he has stated the kind as difference; for it is also possible for someone to introduce a thesis of this sort—for example, making mixture the difference of blend or change of place that of spatial movement. All such cases must be looked at by means of the same procedures; for their topics are interrelated; for the extension of the kind must be wider than that of the difference and must not participate in its difference. But if the kind is assigned as difference, neither of these things can follow; for the extension of the kind will be narrower and the kind will participate in the difference.

Again, if none of the differences belonging to the kind are predicated of the assigned form, the kind will not be predicated of it either—for example, neither odd nor even is predicated of soul, so that number is not predicated of it either. Further, look to see whether the form is prior in nature, and does away with the kind along with itself; for it seems that the contrary is so. Further, look to see whether it is possible for the stated kind, or for its difference, to be absent from the form—for example, for movement to be absent from soul or true and false from belief—for then neither can be its kind or its difference; for the kind and difference seem to follow along with the form, as long as it exists.

4.3
Contraries, Inflections, and Co-ordinates

Look to see too whether what is put in the kind participates in something contrary to the kind, or could possibly participate in it; for then the same thing will participate in contraries at the same time, since the kind is never absent from it, while the thing at issue also participates in what is contrary to the kind, or could possibly participate in it. Further, look to see whether the form shares in something that cannot at all belong to what is in the kind—for example, if the soul shares in life, while no number can possibly be alive, the soul could not be a form of number.

88. Reading σχεδὸν γὰρ ἡ φορὰ ἐπὶ τῶν ἀκουσίως.
89. Reading ἀεὶ δ' ἡ διαφορὰ.
90. 107b29–30.

Look also to see whether the form is homonymous with regard to the kind, using the elements [or topics] already stated for dealing with the homonymous; for the kind and the form are synonymous.

Since of every kind there are several forms, look to see whether it is not possible for there to be another form of the stated kind [besides the assigned one]; for if there is none, it is clear that what is stated could not be a kind at all.

Also, look to see whether the opponent has assigned as the kind what is said of things by means of a metaphor—for example, temperance is harmony; for it is in its literal sense that every kind is predicated of the [several] forms, but harmony is predicated of temperance not in its strict sense but by means of a metaphor; for every harmony consists of notes.

Further, if the form has a contrary, one must look at it. This investigation takes **$123^{b}1$** place in various ways. First of all, look to see whether the contrary is also in the same kind, when the kind has no contrary; for contraries must be in the same kind, if there is no contrary to the kind. On the other hand, if the kind has a contrary, look to see whether the contrary of the form is in the contrary kind; for the contrary form is of necessity in the contrary kind, if indeed the kind has a certain contrary. Each of these points is evident by induction. Again, look to see whether the contrary of the form is not in any kind at all, but is itself a kind—for example, the good; for if this is not in any kind, the contrary of it will not be in any kind either, but will itself be a kind, as happens in the case of the good and the bad; for neither of them is in a kind, but each is itself a kind.

Further, look to see whether both kind and form each has a contrary, and whether there is an intermediate between one pair of contraries but not the other. For if there is an intermediate between the kinds, there is also one between the forms, and if there is one between the forms, there is also one between the kinds, as in the case of virtue and vice, justice and injustice; for each pair has an intermediate. (An objection to this: There is no intermediate between health and disease, though there is one between bad and good.) Or look to see whether, though there is a middle term between both pairs (that is, between the forms and between the kinds), there is not one in the same way, but rather in one case it is by way of negation, while in the other it is as underlying subject. For it is an acceptable belief that it is the same way in both, as in the cases of virtue and vice and justice and injustice; for in both cases the middle terms are by way of negation.

Further, when there is no contrary to the kind, look to see not only whether the contrary is in the same kind, but whether the middle term is too; for it is the kind the extremes are in that the middle terms are also in—as, for example, in the case of white and black; for color is the kind of these and also of all the middle colors. (Objection: Deficiency and excess are in the same kind—for both are in the kind of bad; but the moderate amount, which is intermediate between them, is not in the kind of bad, but in that of good.) Also, look to see whether, while the kind is contrary to something, the form is not contrary to anything. For if the kind is contrary to something, the

form is too, as virtue is the contrary of vice, and justice of injustice.[91] Similarly, if one were to look at the other cases, this would seem evident. (Objection in the case of health and disease: Health is unconditionally the contrary of disease, yet certain disease—for example, fever, eye disease, and each of the others—has no contrary.)

124ᵃ1 When doing away with things, then, investigate in this many ways; for if the stated things do not belong to it, it is clear that what has been assigned is not the kind.

When establishing, on the other hand, one must look in three ways. First of all, look to see whether the contrary [of the form] is in the stated kind, when the kind has no contrary; for if the contrary is in it, it is clear that the one proposed is too. Further, look to see whether the intermediate is in the stated kind; for what the intermediate is in, the extremes are also in. Again, if the kind has a contrary, look to see whether the contrary form is also in the contrary kind; for if it is, clearly the form proposed is in the kind proposed.

Again, in the case of the inflections and co-ordinates [of form and kind], look to see whether they follow along in a similar way, both when doing away with things and when establishing them; for whatever belongs or does not belong to one, at the same time belongs or does not belong to all—for example, if justice is a sort of scientific knowledge, what is done justly is done in a scientifically knowledgeable way and a just person is a scientific knower. But if any of these is not so, none of the rest is either.

4.4
Additional Topics

Again, look at things that bear a similar relation to each other. For example, pleasant bears a similar relation to pleasure as beneficial does to good; for in each case, the one is productive of the other. If, then, pleasure is precisely good, pleasant will also be precisely beneficial; for it is clear that it would be productive of good, since pleasure is good. It is the same way too in the case of comings to be and passings away—for example, if to build is to be active, then to have built is to have been active, and if to learn is to remember, to have learned is to have remembered, and if to be dissolved is to pass away, to have been dissolved is to have passed away, and dissolution is a sort of passing away. And look in the same way at what causes coming to be and what causes passing away, at the capacities and uses of things, and, in general, both when doing away with things and establishing them, look at them in the light of any similarity whatever, as we just stated in the case of coming to be and passing away. For if what causes things to pass away causes them to dissolve, to pass away is to be dissolved; and if what causes things to come to be causes them to be produced, to come to be

91. Reading καθάπερ ἀρετὴ κακίᾳ καὶ δικαιοσύνη ἀδικίᾳ.

is to be produced, and coming to be is production. It is the same way too in the case of capacities and uses; for if a capacity is a disposition, to be capable of something is to be disposed to do it, and if the use of something is an activity, to use is to be active and to have used is to have been active.

If the opposite of a form is a privation, there are two ways to do away with [a claim]. First, look to see whether the opposite is in the assigned kind; for either the privation is unconditionally not anywhere at all in the same kind or not in the ultimate kind—for example, if sight is in perception as its ultimate kind,[92] blindness will not be perception. Second, if a privation is opposed both to the kind and to the form, but the opposite form is not in the opposite kind, neither would the assigned form be in the assigned kind. When doing away with things, then, use the ways as stated. When establishing, on the other hand, there is only one way; for if the opposite form is in the opposite kind, the form would be in the kind proposed—for example, if blindness is a certain sort of non-perception, sight is a certain sort of perception.[93]

Again, look at the denials in reverse order, as was stated in the case of the coincident[94]—for example, if pleasant is precisely good, what is not good is not pleasant; for it is impossible, if indeed good is the kind of pleasant, for anything not good to be pleasant; for what the kind is not predicated of, the form is not predicated of either. Also, when establishing, look in the same way; for if what is not good is not pleasant, what is pleasant is good, so that good is the kind of pleasant.

If the form is a relative, look to see whether the kind is also a relative; for if the form is a relative, the kind is too—for example, double and multiple; for each is a relative. If, on the other hand, the kind is a relative, it is not necessary for the form also to be one; for scientific knowledge is among the relatives,[95] but the craft of grammar is not. (Alternatively, perhaps not even the first thing stated would be believed to be so; for virtue is precisely noble and precisely good, and virtue is among the relatives, but good and noble are not among the relatives, but are qualities.)

Again, look to see whether the form is not said relative to the same thing both intrinsically and with respect to the kind—for example, if double is said of things as double of half, then multiple must be said of things as multiple of half. If it is not, multiple would not be the kind of double.

Further, look to see whether the form is not said relative to the same thing both with respect to the kind and with respect to all of the kinds of the kind. For if double is multiple of half, it will also be said to be "in excess" of the half, and, with respect to all the higher kinds, will unconditionally be said relative to half. (Objection: Something is not necessarily said of things intrinsically and with respect to the kind relative to the same thing; for scientific knowledge is said to be of the scientifically knowable, but a state or disposition is not of the scientifically knowable, but of the soul.)

92. I.e., the highest one.
93. Reading αἴσθησίς τις.
94. $113^{b}15–26$.
95. $121^{a}1$.

Further, look to see whether the kind and form are said in the same way with respect to the inflections—for example, whether to something, of something, or in as many other ways as there are. For as the kind is said of things, so too is the form, as in the case of double and its higher kinds; for both double and multiple are of something. It is the same way too in the case of scientific knowledge; for both scientific knowledge itself and its kinds—for example, disposition and state—are of something. (Objection: In some cases it is not so. For different and contrary are from or to something, but other, which is their kind, is not from or to, but than something; for something is said to be other than something.)

Again, look to see whether the relatives said in accord with the inflections are similar or not similar when converted, as in the case of double and multiple. For each of these is said to be of something, both it itself and in accord with its conversion; for both a half and a fraction are of something. It is the same way too in the case of scientific knowledge and supposition; for these themselves are of something and, when converted, are similar; for both the scientifically knowable and the supposable are so *to* something.[96] If, then, in some cases the conversions are not similar, it is clear that one is not the kind of the other.

Again, look to see whether the form and kind are not said relative to the same number of things. For it seems that both are said in the same way and of the same number of things, as in the case of gift and giving; for a giving is said to be of something to someone, and a gift is of something to someone. And giving is the kind of gift; for a gift is a giving without a giving in return. In some cases, however, the thing is not said relative to the same number of things; for double is double of something, while excess and greater is of something in something; for everything that is in excess (or greater) is always in excess in something and in excess of something. So the things mentioned are not the kinds of double, since they are not said relative to the same number of things. (Alternatively, perhaps it is not universally true that the form and kind are not said relative to the same number of things.)

See too whether the opposite of the kind is the kind of the opposite form—for example, whether, if multiple is the kind of double, fraction is the kind of half; for the opposite of the kind must be the kind of the opposite form. If, then, someone posits that scientific knowledge is precisely perception, the scientifically knowable must also be precisely the perceptible. But it is not; for not everything that is scientifically knowable is perceptible; for in fact some scientifically knowable things are intelligible. So the perceptible is not the kind of the scientifically knowable. And, if this is so, perception is not the kind of scientific knowledge either.

Since of things said as relatives: Some are of necessity in, or have to do with, those things relative to which they happen at any time to be said (for example, disposition, state, and commensurability; for the things just mentioned cannot possibly belong in anything other than the things relative to which they are said). Others, by contrast,

96. *Cat.* $6^{b}34$–35.

do not necessarily belong in those things relative to which they happen at any time to be said, although it is possible (for example, if the soul is said to be scientifically knowable; for there is nothing to prevent the soul from having scientific knowledge of itself, although it is not necessary; for it is possible for this same scientific knowledge to belong in something else). Others cannot possibly belong unconditionally in those things relative to which they happen at any time to be said (for example, **125^{b}1** the contrary in the contrary, or scientific knowledge in the scientifically knowable, unless the scientifically knowable happens to be a soul or a human). Look, then, to see whether the opponent has put something of one sort into a kind that is not of that sort—for example, if he has said that memory is the persistence of scientific knowledge; for all persistence is in what persists and has to do with that, so that the persistence of scientific knowledge too is in the scientific knowledge. Memory, therefore, is in the scientific knowledge, since it is the persistence of scientific knowledge. But this is impossible; for all memory is in the soul.

The topic just stated is common also to the coincident; for it makes no difference whether we say that persistence is the kind of memory or that it is a coincident of it; for if memory is in any way whatever the persistence of scientific knowledge, the same argument will apply to it.

4.5
Additional Topics

Again, look to see whether the opponent has put a state in an activity or an activity in a state—for example, by saying that perception is a movement through the body;[97] for perception is a state, while movement is an activity. Similarly, if he has said that memory is a state that retains a supposition;[98] for no memory is a state, but rather an activity.

People also err who place a state in the capacity that follows along with it—for example, saying that mild-manneredness is the self-control of anger, courage of fears, and justice of profits; for courageous and mild-mannered are said of someone who feels no [anger or fear that needs controlling], while the self-controlled person is the one who feels but is not led by [these]. Perhaps each of these states is indeed followed along with by a capacity of such a sort that, if the person were to feel these feelings, he would not be led by them but rather would control them. But yet this is not what the being for courage is or the being for mild-manneredness, which is rather not to feel such feelings at all.

Sometimes too people posit as kind whatever follows along with [the form]—for example, positing pain as a kind of anger and supposition as a kind of conviction;

97. *Ph*. 244^{b}11–12.
98. *Mem*. 449^{b}24–25.

for while both of the things just mentioned follow along in a way with the assigned forms, neither of them is their kind. For when the person who is feeling anger is pained, the pain has come about in him beforehand; for the anger is not the cause of the pain, but rather the pain of the anger, so that anger is not pain unconditionally.[99] In line with the same reasoning, conviction is not supposition either; for it is possible to have the same supposition without actually being persuaded of it, while this is not possible if indeed conviction is a form of supposition; for it is not possible for a thing to persist as still the same if it is wholly changed in form, just as it is not possible either for the same animal to be at one time a human and at another not. But if someone said that a person who has a supposition is of necessity also persuaded of it, supposition and conviction will have the same extension, so that not even in this way could the one be a kind of the other; for the kind must have a wider extension.

See too whether both naturally occur in the same thing; for what the form occurs in, the kind also occurs in—for example, what white occurs in, color also occurs in, and what the craft of grammar occurs in, scientific knowledge also occurs in. If, then, someone said that shame is fear, or anger pain, it will follow that kind and form do not belong in the same thing; for shame is in the rationally calculative part, while fear is in the spirited one, and pain in the appetitive one (for pleasure is also in it), while anger is in the spirited one.[100] So that what are assigned are not the kinds, since they do not naturally occur in the same thing as the form. Similarly, if love is in the appetitive part, it is not a sort of wish; for all wish is in the rationally calculative part.

This topic too is useful in relation to the coincident; for the coincident and what it is coincident with are in the same thing, so that if they do not appear in the same thing, it is clear that it is not a coincident.

Again, look to see whether the form participates in the proposed kind only in a certain respect; for the kind seems not to be participated in only in a certain respect. For human is not only in a certain respect animal, nor the craft of grammar only in a certain respect science. It is the same way in the other cases too. Look to see, then, whether in some cases the kind is participated in only in a certain respect—for example, if animal is said to be precisely what is perceptible or precisely what is visible. For it is only in a certain respect that animal is perceptible or visible; for in respect of its body it is perceptible and visible, but in respect of its soul it is not. So visible and perceptible could not be the kind of animal.

Without noticing it, people also sometimes put the whole in the part—for example, saying that animal is animate body. But the part is not predicable of the whole at all, so that body cannot be the kind of animal, since it is a part.

See too whether the opponent has put anything that is blameworthy or to be avoided in [the kind of] capacity or the capable—for example, saying that a sophist,

99. 151ᵃ15–17.
100. Cf. *NE* 1128ᵇ10–15.

slanderer, or thief is one who is capable of stealing in secret what is another's;[101] for none of those just mentioned is said to be of the sort that he is because he is capable of one of these things. For both the god and the excellent person are capable of doing base things, but are not of that sort; for the base are all said to be such with respect to their deliberate choice. Further, every capacity is choiceworthy; for even the capacities for base things are worthy of choice, which is why we say that a god and an excellent person have them; for we say that they are capable of doing base things. So capacity cannot be the kind of anything blameworthy; for otherwise it will follow that something blameworthy is worthy of choice; for there will be a certain capacity that is blameworthy. **126^{b}1**

Also, look to see whether he has put anything that is estimable or choiceworthy because of itself in [the kind of] capacity, the capable, or the productive; for every capacity and everything capable or productive is choiceworthy [only] because of something else.

Or look to see whether he has put anything that is in two or more kinds in only one of them; for there are some things that cannot be put in only one kind—for example, the cheat and the slanderer; for neither the one with the deliberate choice to do it but without the capacity, nor the one with the capacity but not the deliberate choice, is a slanderer or a cheat, but rather the one with both. So he must be placed not in one kind, but in both of the kinds just mentioned.

Further, sometimes, reversing the order, people assign the kind as difference or the difference as kind—for example, saying that amazement is the excess of wonder, and conviction is intensity of supposition. For neither excess nor intensity is kind but difference; for amazement seems to be excessive wonder and conviction intense supposition, so that wonder and conviction are kind, while excess and intensity are difference.[102]

Further, if excess and intensity are assigned as kind, inanimate things will be persuaded and amazed; for the intensity and excess of a given thing are present in what they are the intensity and excess of.[103] If, then, amazement is the excess of wonder, amazement will be present in wonder, so that the wonder will be amazed. Similarly, conviction will be present in supposition, if indeed it is intensity of supposition, so that the supposition will be persuaded. Further, assigning things in this way will result in saying that intensity is intense and excess excessive. For there is intense conviction. If, then, conviction is intensity, intensity would be intense. It is the same way there is also excessive amazement. If, then, amazement is excess, excess would be excessive. But neither of these seems to be so, any more than scientific knowledge is a scientifically knowable thing or movement a moving thing.

101. A thief steal's another person's property; a slanderer, another's reputation; a sophist, another person's beliefs or convictions (Plato, *Republic* 413b).

102. Reading ὥστε . . . διαφορά.

103. Reading οὗ ἐστι σφοδρότης καὶ ὑπερβολή.

Sometimes people also err in putting an affection in what has been affected, as its kind—for example, those who say that immortality is eternal life; for immortality seems to be an affection or coincident of life. And that what is said is true would be clear were one to concede that someone could become immortal from having been mortal; for no one will say that he gets a distinct life, but rather that a coincident or affection is added to this same life. So life is not the kind of immortality.

Again, look to see whether they say that an affection is what it is an affection of—for example, saying that wind is moving air. For the same air persists both when moving and when at rest. So wind is not air at all; for otherwise there would be wind even when the air was not moving, if indeed the same air that was wind still persists. It is the same way in other cases of this sort too. Even, then, if one must in this case concede that wind is moving air, nonetheless one must not concede the sort of thing that is assigned with regard to everything of which the kind is not true, but only where the assigned kind is truly predicated. For in some cases—for example, mud and snow—it does not seem to be true. For people say that snow is frozen water and that mud is earth mixed with moisture. But snow is not water, nor is mud earth. So neither of the assigned things could be the kind; for the kind must always be true of every form. Similarly, wine is not fermented water either, in the way that Empedocles speaks of "water fermented in wood";[104] for, unconditionally, wine is not water at all.

4.6
Additional Topics

Further, look to see whether what is assigned is not the kind of anything at all; for clearly it is not then the kind of the form mentioned. Look on the basis of there being no difference in form between the participants of the assigned kind—for example, white things; for these do not differ at all in form from each other, but the forms of all the kinds are different from each other. So white could not be the kind of anything.

Again, look to see whether the opponent has stated as kind or difference something that follows along with everything; for there are several things that follow everything—for example, being and one follow along with everything. If, then, he has assigned being as kind, it is clear that it would be the kind of everything, since it is predicated of them. The kind in fact is not predicated of anything except its forms. So *one* would also be a form of being. It follows, then, that the form too is predicated of everything that the kind is predicated of, since being and one are predicated unconditionally of everything, but the form must be predicated of fewer things. If he has said that what follows everything is a difference, it is clear that the difference will have the same extension as the kind or a wider one; for if the kind too is one of the things

104. B81 DK.

that follow everything, the difference will have the same extension, but if the kind does not follow everything, the difference will have a wider extension than the kind.

Further, look to see whether the assigned kind is said to be in the form as in an underlying subject, as, in the case of snow, white is, so that it is clear that it could not **127ᵇ1**
be the kind; for the kind is only said of the form as underlying subject.[105]

Look to see too whether the kind is not synonymous with the form; for the kind 5
is always predicated synonymously of all the forms.

Further, there is the case where both the kind and the form have a contrary, and your opponent puts the better of the contrary [forms] in the worse kind; for it will follow that the remaining forms will be in the remaining kind, since the contraries are in contrary kinds, so that the better form will be in the worse kind, and the worse 10
in the better; but it seems that the kind of the better is also better. Also, look to see whether, if the same thing is similarly related to both, the opponent has put it in the worse and not in the better kind—for example, saying that the soul is just movement or a thing in movement. For the same soul seems to be similarly capable of rest and 15
capable of movement; so, if rest is better,[106] he should have put soul in this kind.

Further, look on the basis of the more and the less, when disestablishing, to see whether the kind admits of the more, while the form does not do so, neither itself, nor anything said to be what it is in accord with it. For example, if virtue admits of 20
the more, justice and the just person do too; for one person is said to be more just than another. If, then, the assigned kind admits of the more, but the form itself does not do so, and neither does anything said to be what it is in accord with it, the assigned one could not be the kind. 25

Again, if what seems more to be the kind [than what is assigned], or seems equally to be so, is not the kind, it is clear that what is assigned is not the kind either. This topic is useful especially in the sorts of cases where several things appear to be predicable of the form in the what-it-is, no distinction having been drawn between them, nor can we say which of them is kind. For example, both pain and supposition seem 30
to be predicated of anger in the what-it-is, for the angry person both feels pain and supposes he is being treated with contempt. The same investigation is also applicable in the case of the form, by comparing it to another form; for if what seems more or equally to be in the assigned kind is not in the kind, it is clear that the assigned form 35
could not be in the kind either.

When doing away with things, then, use what was just stated. When establishing, on the other hand, the topic of looking to see whether both the assigned kind and the assigned form admit of the more is not useful; for even though both admit of it, **128ª1**
there is nothing to prevent one from not being the kind of the other; for both noble and white admit of it, and neither is a kind of the other. By contrast, the comparison of the kinds and the forms with each other is useful—for example, if this kind and 5

105. *Cat.* 1ª20–29.
106. *NE* 1154ᵇ26–31.

that one equally seem to be kinds, if one is a kind, the other is too. Similarly too, if the one that less seems to be so is a kind, the one that more seems to be so is also—for example, if capacity more seems to be the kind of self-control than virtue does, and virtue is a kind, so is capacity. The same things will be fitting to say also in the case of the form; for if this and that equally seem to be a form of the kind proposed, if one of them is a form of it, the remaining one is as well. And if what less seems to be a form is one, what more seems to be a form is one too.

Further, for the purposes of establishing, look to see whether, of the things of which something has been assigned as kind, it has been predicated in the what-it-is, in the case where not one but several different forms are assigned; for then it is clear that it will be a kind. If, on the other hand, a single form is assigned, look to see whether the kind is predicated of the other forms as well; for then again it will follow that it is predicated of several different ones.

Since it seems to some people that the difference too is predicated of the form in the what-it-is, the kind must be separated from the difference by the use of the elements [or topics] mentioned: first, the kind has a wider extension than the form; further, in assigning the what-it-is it is more fitting to state the kind than the difference (for someone who says that what is human is animal makes the what-it-is more clear than someone who says that it is what is terrestrial); the difference always signifies a quality of the kind, while the kind does not signify a quality of the differences (for someone who says "terrestrial" says "animal of a certain quality," while someone who says "animal" does not say "terrestrial of a certain quality").

This, then, is how the difference must be separated from the kind. Since it seems that if what is musical is, insofar as it is musical, scientifically knowledgeable, music is a sort of scientific knowledge, and if what walks is in movement by walking, walking is a sort of movement—look, in the way just mentioned, at any kind in which one wishes to establish the presence of something. For example, if one wishes to establish that scientific knowledge is precisely conviction, see whether the person who is scientifically knowledgeable, insofar as he knows scientifically, is persuaded; for then it is clear that scientific knowledge would be a sort of conviction. And look in the same way at other cases of this sort too.

Further, since it is difficult to separate what always follows along with a thing and is not convertible with it from what [make it] not be of its kind, if this always follows along with that, but not that with this (as, for example, calm always follows along with absence of wind and divisible with number, but not conversely—for what is divisible is not always a number, nor a calm an absence of wind), one may oneself use as kind of a thing what always accompanies it, when the other is not convertible with it. If, on the other hand, the other person proposes it, one must not grant it in every case. Objection to this: What is not always follows along with what is coming to be (for what is coming to be is not) and is not convertible with it (for what is not is not always coming to be); nonetheless, what is not is not the kind to which coming to be belongs; for what is not simply has no forms.

Concerning the kind, then, inquire in the ways stated.

BOOK 5[107]

5.1
Sorts of Special Affections

To see whether what is stated is a special affection or not, look in the following ways.

A special affection is assigned either intrinsically and always so or in relation to something else and at a time. An example of an intrinsic special affection: a human is "by nature a tame animal"; of one in relation to something else: soul in relation to body (that the one is suited for prescribing and the other for serving); of one that is always so: a god is an "immortal animal"; of one that is so at a time—for example, for a certain human, "walking about in the gymnasium."

What is assigned as a special affection in relation to something else is either two or four problems. For if one assigns this same special affection in relation to one thing and refuses it to another, only two problems arise, as when one assigns "two-footed" as a special affection of the human in relation to the horse. For someone might attack it both by arguing that the human is not two-footed and by arguing that the horse is two-footed. And in both ways the special affection would be undermined. But if, of two affections, one assigns one and refuses the other to each of two things, there will be four problems, as when one assigns to the one "two-footed" and to the other "four-footed" as a special affection of the human in relation to the horse. For it is possible to attack this both by arguing that the human is not two-footed and by arguing that it is naturally four-footed, and also possible to attack it by arguing that the horse is two-footed and by arguing that it is not four-footed. In whatever way it is proved, then, what has been proposed is done away with.

An intrinsic special affection of something is one assigned in relation to everything, and separates it from everything, as, in the case of a human, does "mortal living being receptive of scientific knowledge." One in relation to something else is one that distinguishes a thing not from everything else but from a certain specified thing, as, in the case of virtue in relation to scientific knowledge, does the fact that virtue by nature comes about in more than one place,[108] while scientific knowledge does so only in the rationally calculative part and in those naturally possessing a rationally calculative part. One that is always so is one that is true of its subject at all times and is never absent from it, as, in the case of a living thing, is "composed of soul and body." One that is so at a time is one that is true of its subject at a certain time and does not of necessity always accompany it, as, in the case of a certain human, is "walking about in the marketplace."

107. The authenticity and placing of this book have been doubted, but it seems to be referred to as coming after discussion of kinds in Book 4 at $120^{b}11$–12 and $139^{b}4$–5.
108. *NE* $1144^{b}3$–$1145^{a}2$.

To assign a special affection in relation to something else is to state a difference that holds either in all cases and always, or for the most part and in most cases. For example, in all cases and always: in the way that it is a special affection of the human in relation to horse that it is "two-footed"; for human is always and in every case two-footed, while no horse at any time is two-footed. For the most part and in most cases: in the way that it is a special affection of the rationally calculative part in relation to the appetitive part and to the spirited part that it prescribes and the other serves; for the rationally calculative part does not always prescribe, sometimes it is also prescribed to, and the appetitive part and the spirited part[109] are not always prescribed to either, but sometimes—when the soul of a human being is depraved—also prescribe.

Among the special affections, the most logico-linguistic are the ones that are so intrinsically and always and the ones that are so in relation to something else. For a special affection that is so in relation to something else is several problems, as we also said previously;[110] for the problems that arise are of necessity either two or four. Hence the arguments that arise in regard to these are several. The one that is intrinsically so and the one that is always so may be attacked in relation to many things or looked out for in relation to several times. The one that is intrinsically so can be attacked in relation to many things (for it is in relation to each of the beings that the special affection of a particular being must belong to it, so that if this being is not separated by it in relation to all of them, the special affection could not have been correctly assigned); the one that is so always can be looked out for in relation to many times; for if it does not belong, did not belong, or is not going to belong, it will not be a special affection.[111] On the other hand, the one that is so at a time we look at in relation to the now-said time.[112] There are not, then, many arguments with regard to it. But a logico-linguistic problem is one with regard to which it is possible for arguments that are both many and good to arise.

What has been said to be a special affection in relation to something else, then, must be looked at on the basis of the topics dealing with the coincident, to see whether it is coincident with one thing and not coincident with another. But on those that are so always and on those that are intrinsic, one must look at by means of the following [topics].

109. Reading καὶ θυμικὸν here and at 129ª14.

110. 128ᵇ22–23.

111. Reading παρατηρεῖν, as at 129ª23.

112. Suppose A says now that it is a special affection of B to be walking about in the gymnasium. The time he says it is both the time of B's walking (the time that is now when he says it) and the time at which its truth value is to be determined.

5.2
The Correct Assignment of a Special Affection (1)

First, look to see whether the special affection has been incorrectly or correctly assigned. To see whether it is incorrectly or correctly assigned, one [topic] is to see **$129^{b}1$** whether the special affection is proposed through things that are not better known or through things that are better known—when disestablishing, see whether they are not proposed through things that are better known; when establishing, whether they are proposed through things that are better known.[113]

To prove that it is assigned through things that are not better known, one way is to look to see whether the special affection one assigns is wholly more unknown 5 than the subject whose special affection one has stated it to be; for then the special affection will not have been correctly proposed. For it is for the sake of knowledge that we render the special affection.[114] The subject must, then, be separated by means of things that are better known; for this way it will be possible to understand it more adequately. For example, since a person who has posited "most similar to soul" as a special affection of fire makes use of soul, which is more unknown than fire (for 10 we know more what fire is than soul), "most similar to soul" would not be correctly proposed as a special affection of fire.

Another way is to look to see whether this special affection is not better known as belonging to this subject. For not only must this special affection be better known than the thing in question, but also it must be better known as belonging to this subject; for a person who does not know whether this one belongs to this thing will 15 also not know whether it belongs to it alone, so that, whichever of the two situations occurs, the special affection comes to lack perspicuousness. For example, since a person who has posited "what soul is naturally found primarily in" as a special affection of fire has made use of something more unknown than fire, namely, whether soul is found in fire and whether it is found primarily in it, "what soul is naturally found primarily in" would not be correctly proposed as a special affection of fire. 20

When establishing, on the other hand, look to see whether the special affection is proposed through things that are better known, and whether the "better known" holds in each of the two ways.[115] For then the special affection will in this respect have been correctly proposed; for of the topics useful for establishing that a special affection is correctly proposed, some will prove that in this respect only it is correctly proposed, others that it is unconditionally correctly assigned. For example, since a 25 person who has stated "possessing perception" as a special affection of animal has assigned it through things that are better known, in accord with each of the two ways,

113. *Ph.* $184^{a}16$–18, *Met.* $1029^{b}3$–5.
114. $130^{a}4$–5, $131^{a}1$.
115. Better known than its subject and better known to belong to it.

"possessing perception" would in this respect have been correctly assigned as a special affection of animal.

Next, when disestablishing, look to see whether any of the names assigned in [the account of] the special affection is said of things in many ways, or whether too the account as a whole signifies several things; for then the special affection will not have been correctly proposed. For example, since "to perceive" signifies several things, to have perception and to be using perception, "to naturally perceive" would not be correctly proposed as a special affection of animal. Because of this, neither a name nor an account said of things in several ways must be used in signifying a special affection, because what is said of things in many ways makes what is said lack perspicuousness, puzzling the person about to attack it as to which of the several things being said one means; for a special affection is assigned for the sake of learning. Further, in addition to this, it is necessary for those who assign a special affection in this way to submit to a sort of refutation, when someone produces a deduction in the case of one of the many ways in which the thing is said where there is a discordance.[116]

When establishing, on the other hand, look to see whether all the names and also the account as a whole do not signify several things; for the special affection will then in this respect be correctly proposed. For example, since "body" does not indicate many things and neither does "what is most easily moved upward" or the whole composed by putting these together, "the body that is most easily moved upward" would be correctly proposed in this respect as a special affection of fire.

Next, when disestablishing, look to see whether what the special affection is assigned to is said of things in many ways, but it is not made determinate in which of them one is positing it as a special affection; for then the special affection will not have been correctly assigned. The cause due to which this is so is not unclear from what was said previously;[117] for the same things necessarily follow. For example, since "the scientific knowledge of this" signifies many things (for it signifies its having scientific knowledge, its using scientific knowledge, having scientific knowledge of it, and using the scientific knowledge of it), a special affection of "the scientific knowledge of this" would not be correctly assigned, without its having been made determinate of which of them one is positing it as a special affection.

When establishing, on the other hand, look to see whether the thing one posits the special affection of is not said of things in many ways, but is rather one and simple; for then the special affection will in this respect be correctly proposed. For example, since human is said of things in one way, "animal tame by nature" would be correctly proposed in this respect as a special affection in the case of human.

Next, when disestablishing, look to see whether the same thing has been said several times in the special affection; for often, without its being noticed, people do this in special affections too, just as they also do in definitions. And a special affection to

116. 111ᵇ24, 114ᵇ32.
117. 129ᵇ30–130ᵃ14.

which this has happened will not be correctly proposed; for what is said many times confuses the listener. Thus it necessarily becomes non-perspicuous, and in addition the proposers seem to babble.[118] Saying the same thing several times will happen in two ways: one is when someone has used the same name several times—as would happen if someone were to assign "the body that is the lightest of bodies" as a special affection of fire (for he has said body several times); second, if he were to assign accounts in place of names—as would happen if he were to assign "the substance that of all bodies is, in accord with nature, most spatially moved downward" as a special affection of earth, and were then to put "substances of such-and-such sort" in place of "bodies," since body and substance of such-and-such sort are one and the same; for in this way "substance" will be said several times. So neither of these special affections would have been correctly proposed.

When establishing, on the other hand, look to see whether one is not using the same name several times; for then the special affection would in this respect have been correctly assigned. For example, since a person who has stated "animal receptive of scientific knowledge" as a special affection of human has not used the same name several times, the special affection of human would in this respect have been correctly assigned.

Next, when disestablishing, look to see whether the opponent has assigned in the special affection anything of the sort that belongs to everything. For what does not separate the subject from certain things will be useless, while what is said in special affections must separate it, just as what is said in definitions also must. Hence the special affection will not be correctly proposed. For example, since a person who has posited as a special affection of scientific knowledge, "supposition that is incapable of being persuaded to change by argument, since it is one,"[119] has used something in the special affection—the "one"—that belongs to everything, the special affection of scientific knowledge would not have been correctly proposed.

When establishing, on the other hand, look to see whether one has used not something common, but something that separates the subject from something; for then the special affection will in this respect be correctly proposed. For example, since a person who has stated "possessing a soul" as a special affection of living thing has used nothing common, "possessing a soul" would in this respect have been correctly proposed as a special affection of living thing.

Next, when disestablishing, look to see whether the opponent has assigned several special affections to the same thing, without determining that he is positing several; for then the special affection will not be correctly proposed. For just as in definitions nothing more must be proposed beyond the account that indicates the substance, so too in special affections nothing must be assigned beyond the account that makes

118. *SE* 165^{b}15–17, 173^{a}31–^{b}16, 181^{b}25–182^{a}6.

119. Reading ἓν ὄν. "One" is presumable to be understood as meaning "tightly unified." See *APo*. 72^{a}37–^{b}4.

what is stated the special affection; for something of that sort is useless. For example, since a person who has stated "the most fine-grained and lightest body" as a special affection of fire has assigned several special affections (for each of the two is truly stated of fire alone), "the most fine-grained and lightest body" would not have been correctly proposed as a special affection of fire.

When establishing, on the other hand, look to see whether one has not assigned several special affections to the same thing, but rather only one; for then the special affection will be in this respect correctly proposed. For example, since a person who has stated "body that is brought to assume any shape" as a special affection of liquid has assigned one thing and not several as its special affection, the special affection of liquid would in this respect have been correctly proposed.

5.3
The Correct Assignment of a Special Affection (2)

Next, when disestablishing, look to see whether the opponent has made additional use either of the subject itself whose special affection one is assigning, or something belonging to it; for then the special affection will not be correctly proposed. For a special affection is assigned for the sake of learning.[120] The subject, on the other hand, is as unknowable as itself, while anything belonging to it is posterior to it, and hence no better known than it is, so that through these we cannot learn anything more.[121] For example, since a person who has stated "substance of which human being is a form" as a special affection of living thing has made additional use of something belonging to it, the special affection would not have been correctly proposed.

When establishing, on the other hand, look to see whether one is not using either the subject itself or anything belonging to it; for then the special affection will in this respect be correctly proposed. For example, since a person who has posited "composed of soul and body" as a special affection of living thing has not made use of the thing itself or anything belonging to it, the special affection of living thing would in this respect have been correctly assigned.

In the same way, look in the case of other things that do not make the subject better known. When disestablishing, look to see whether the opponent has made additional use of anything that is either opposite to the subject or, in general, anything simultaneous in nature with it or posterior to it; for then the special affection

120. 129ᵇ7–8.

121. Suppose A is a special affection of B, and the opponent makes use of B in proposing A. Then A will not teach us about B, because we must already know B in order to understand A. Suppose that instead of using B itself in proposing A, the opponent uses X, which is a form of B. Then the definition of X will include B, and so A will again not teach us anything new about B.

will not be correctly proposed.[122] For the opposite of a thing is simultaneous by nature with it, and what is simultaneous by nature with a thing and what is posterior to it do not make it better known. For example, since a person who has stated "most opposed to bad" as a special affection of good has made additional use of the opposite of good, the special affection would not have been correctly assigned.

When establishing, on the other hand, look to see whether one has not made additional use of anything that is either opposite to the subject or, in general, simultaneous in nature with it, or posterior to it; for then the special affection will in this respect have been correctly assigned. For example, since a person who has posited "most persuasive supposition" as a special affection of scientific knowledge has not made additional use of anything either opposite to, simultaneous in nature with, or posterior to the subject, the special affection of scientific knowledge would in this respect have been correctly proposed.

Next, when disestablishing, look to see whether the opponent has not assigned as a special affection something that does not always accompany the subject but rather something that sometimes ceases to be a special affection; for then the special affection will not be correctly stated. For the name of the subject is not of necessity true of what we find the special affection to belong to, nor is the name of the subject of necessity not applied to what we find the special affection does not to belong to, so that the special affection would not have been in this respect correctly proposed. Further, in addition to this, even when he has assigned the special affection, it will not be evident that it belongs, if indeed it is the sort of thing that may be absent.[123] The special affection, then, will not be perspicuous. For example, since a person who has posited "moving" as a special affection of living thing has assigned the sort of special affection that is sometimes not a special affection, the special affection would not have been correctly proposed.

When establishing, on the other hand, look to see whether one has assigned what of necessity is always a special affection; for then the special affection will in this respect be correctly proposed. For example, since a person who has posited "what **131b1** makes its possessor excellent" as a special affection of virtue has assigned as a special affection what always accompanies its subject, the special affection of virtue would have been in this respect correctly assigned.

Next, when disestablishing, look to see whether in assigning a now-special affection, the opponent has not made it determinate that it is a now-special affection that he is assigning; for then the special affection will not be correctly proposed. For, first, anything beyond what is customary always needs to be made additionally determinate, and people are for the most part accustomed to assigning as a special affection what always accompanies the subject. Second, a person is unclear who has not made it determinate whether it is a now-special affection that he wished to posit,

122. *Cat.* 14b27–15a7.
123. 131b19–36.

and one must not give any pretext for critical investigation. For example, since a person who has posited "sitting with a certain someone" as a special affection of a certain human being posits a now-special affection, the special affection would not have been correctly assigned, if indeed he stated it without making this determinate.

When establishing, on the other hand, look to see whether in assigning a now-special affection one has posited it making it determinate that one is positing a now-special affection; for then the special affection will in this respect be correctly proposed. For example, since a person who has stated "walking about now" as a special affection of a certain human being has made this determinate in his statement, the special affection would be correctly proposed.

Next, when disestablishing, look to see whether the special affection[124] the opponent has assigned is of the sort whose belonging is not evident except to perception; for then the special affection will not be correctly proposed. For every perceptible thing becomes unclear when outside the range of perception; for it is not evident whether it still belongs, because this is known only by perception. And this will be true in the case of any affections that do not always and of necessity follow along with the subject. For example, since a person who has posited "the brightest star spatially moving above the earth" as a special affection of the sun has used in the special affection "spatially moving above the earth" a sort of thing that is known only by perception, the special affection of the sun would not have been correctly assigned; for it will be unclear, when the sun sets, whether it is spatially moving above the earth, because the perception is then absent from us.

When establishing, on the other hand, look to see whether the special affection one has assigned is of the sort that is not evident to perception, or, if it is perceptible, clearly belongs of necessity to the subject; for then the special affection will in this respect be correctly proposed. For example, since a person who has posited "the primary thing that is colored" as a special affection of surface has made use of something perceptible ("colored"), but this is of a sort that manifestly always belongs to it, the special affection of surface would in this respect have been correctly assigned.

Next, when disestablishing, look to see whether the opponent has assigned the definition as special affection; for then the special affection will not be correctly proposed; for a special affection must not indicate the essence.[125] For example, since a person who has stated "terrestrial two-footed animal" as a special affection of human has assigned what signifies its essence as a special affection of human, the special affection of human would not have been correctly assigned.

When establishing, on the other hand, look to see whether the special affection one has assigned is counterpredicated with the subject but does not indicate the essence; for then the special affection will in this respect have been correctly assigned. For example, since a person who has posited "by nature a tame animal" as a special

124. Reading τὸ ἴδιον.
125. 102ᵃ18–19.

affection of human has assigned as special affection something that is counterpredicated of the subject but does not indicate its essence, the special affection of human would in this respect have been correctly assigned.

Next, when disestablishing, look to see whether the opponent has assigned the special affection but has not put [the subject] in its what-it-is. For in special affections, just as in definitions, the first thing to be assigned must be the kind, and then the rest must be attached immediately afterward and must make the separation.[126] So a special affection that is not proposed in this way would not have been correctly assigned. For example, since a person who has stated "having a soul" as a special affection of living thing has not put the living thing in its what-it-is, the special affection of living thing would not have been correctly proposed.

When establishing, on the other hand, look to see whether one has put the subject, whose special affection one is assigning, in its what-it-is, and then attaches the rest; for then the special affection will in this respect have been correctly assigned. For example, since a person who has posited "animal receptive of scientific knowledge" as a special affection of human has put the subject kind in its what-it-is and then assigned the special affection, the special affection of human would, in this respect, have been correctly proposed.

5.4
Whether an Affection Assigned as Special Is in Fact Special (1)

To see whether the special affection has been correctly assigned, then, look by means of these [topics]. But one must look at whether what is stated is a special affection, or not a special affection at all, on the basis of the following ones. For the topics that simply establish that the special affection is correctly proposed will be the same as those that make it a special affection at all, and thus will be stated in connection with these.

First, then, when disestablishing, take a look at each subject of which the opponent has assigned the special affection, to see, that is, whether it belongs to none of them, or whether it is not true of them in the relevant respect; for then what is proposed as being a special affection will not be a special affection. For example, since "not being deceivable by argument" is not true of the geometer (for he could be deceived when a false diagram is drawn[127]), "not being deceivable by argument" would not be a special affection of the scientific knower.

When establishing, on the other hand, look to see whether the special affection is true of every case and true in the relevant respect; for then what is proposed as

126. In Greek the natural order in the definition of human is *zô[i]on pezon dipoun* (animal, terrestrial, two-footed), while in English the natural order is two-footed terrestrial animal, so that the kind comes last.
127. *SE* 171[b]12–16.

not being a special affection will be a special affection. For example, since "animal
132b1 receptive of scientific knowledge" is true of every human, and true of him insofar as he is human, "animal receptive of scientific knowledge" would be a special affection of human. {This topic, when disestablishing, goes this way: look to see whether the account is not true of what the name is true of, and whether the name is not true of what the account is true of; when establishing, on the other hand: look to see whether
5 the account too is predicated of what the name is predicated of, and whether the name too is predicated of what the account is predicated of.}[128]

Next, when disestablishing, look to see whether the account is not said of what the name is said of, and whether the name is not said of what the account is said of;
10 for then what was proposed as being a special affection will not be a special affection. For example, since "living thing that shares in scientific knowledge" is true of the god, but "human" is not predicated of the god, "living thing that shares in scientific knowledge" would not be a special affection of human.

When establishing, on the other hand, look to see whether the name too is predicated of what the account is predicated of, and whether the account too is predicated of what the name is predicated of; for then what is proposed as not being a special
15 affection will be a special affection. For example, since "living thing" is true of "what has a soul" is true of, and "having a soul" is true of what "living thing" is true of, "having a soul" would be a special affection of living thing.

Next, when disestablishing, look to see whether the opponent has assigned the underlying subject as a special affection of what is said to be in[129] the underlying
20 subject; for then what is proposed as a special affection will not be a special affection. For example, since a person who proposes "fire" as a special affection of the body having the finest-grained particles has assigned the underlying subject as a special affection of what is predicated of it, "fire" would not be a special affection of the body having the finest-grained particles. That is why the underlying subject will not be a special affection of what is in the underlying subject, because the same thing will
25 then be a special affection of several things that differ in form. For several things that differ in form belong to the same thing, which are said of it alone, and of all of these the underlying subject will be a special affection, if one posits the special affection in this way.

When establishing, on the other hand, look to see whether one has assigned what is in the underlying subject as a special affection of the subject; for then what is proposed as not a special affection will be a special affection, if indeed it is predicated
30 only of it in the way that a special affection is said. For example, since a person who has stated as a special affection of earth "body heaviest in form" has assigned as a special affection of the underlying subject what is said of that thing alone and in the

128. Secluded as an abridged variant of the topic that follows.

129. Here, unlike at 127b1, "in" does not have its technical meaning, but simply means "predicated of."

way that a special affection is predicated, the special affection of earth would have been correctly proposed.

Next, when disestablishing, look to see whether the opponent has assigned the special affection by virtue of participation; for then what is proposed as a special affection will not be a special affection. For what belongs by virtue of participation[130] contributes to the essence, and, as such, would be a difference said of some one form. For example, since a person who has stated "two-footed terrestrial" as a special affection of human has assigned the special affection as something by virtue of participation, "two-footed terrestrial" would not be a special affection of human.

When establishing, on the other hand, look to see whether one has not assigned the special affection as something by virtue of participation, nor as indicating the essence, though the thing is counterpredicated of it; for then what is proposed as not being a special affection will be a special affection. For example, since a person who has posited "naturally having perception" as a special affection of animal has assigned the special affection neither by virtue of participation nor as indicating the being, though the thing is counterpredicated of it, "naturally having perception" would be a special affection of animal.

Next, when disestablishing, look to see whether the special affection admits of not belonging at the same time as the name, but rather admits of belonging posterior or prior to it; for then what is proposed as a special affection will not be a special affection—either not ever, or not always. For example, since "walking through the marketplace" admits of belonging to someone both prior and posterior to "human," "walking through the marketplace" would not be a special affection of the human—either not ever, or not always.[131]

When establishing, on the other hand, look to see whether the special affection of necessity always belongs at the same time, without being either a definition or a difference; for then what is proposed as not being a special affection will be a special affection. For example, since of necessity "animal receptive of scientific knowledge" always belongs at the same time as "human" does, and is neither a difference nor a definition, "animal receptive of scientific knowledge" would be a special affection of human.

Next, when disestablishing, look to see whether the same thing is not a special affection of the same things, insofar as they are the same; for then what is proposed as being a special affection will not be a special affection. For example, since "appearing good to certain people" is not a special affection of the worthy of pursuit, neither would "appearing good to certain people" be a special affection of the choiceworthy; for the worthy of pursuit and the worthy of choice are the same.

130. 121^{a}11–12.

131. The human is human prior to walking in the marketplace, and posterior to having walked in it.

When establishing, on the other hand, look to see whether the same thing is a special affection of something that is the same thing [as the subject], insofar as it is the same; for then what is proposed as not a special affection will be a special affection. For example, since "having a tripartite soul" is said to be a special affection of human, insofar as it is human, it would also be a special affection of mortal, insofar as it is mortal, to have a tripartite soul.[132] This topic is also useful in the case of the coincident; for to the same things, insofar as they are the same, the same ones must belong, or not belong.

Next, when disestablishing, look to see whether the special affection of things that are the same in form is not always the same in form; for then the proposed special affection will not be a special affection of the stated subject either. For example, since horse and human are the same in form,[133] and it is not always a special affection of a horse "to stand still of its own accord," it would not always be a special affection of a human "to move of its own accord"; for moving of its own accord and standing still of its own accord are the same in form, each of them occurring to an animal insofar as it is animal.

When establishing, on the other hand, look to see whether the special affection of things that are the same in form are always the same in form; for then what is proposed as not being a special affection will be a special affection. For example, since it is a special affection of human to be "two-footed terrestrial," it would also be a special affection of bird to be "two-footed flyer"; for each of these is the same in form, the one lot, insofar as they are forms falling under the same kind, since they fall under animal, and the other lot, insofar as they are differences of the kind "animal." This topic is false when one of the special affections mentioned belongs to one certain form only, while the other belongs to many—for example, "four-footed terrestrial."

Since same and distinct are said of things in many ways, it takes work, faced with someone who takes things in a sophistical way, to assign a special affection of some one thing and of it alone; for what belongs to something that has something as a coincident will also belong to the coincident taken together with the thing it is a coincident of. For example, what belongs to human will also belong to pale human, if human is pale, and what then belongs to pale human will also belong to human. One might, then, attack many special affections by making the underlying subject one thing when taken intrinsically and a distinct thing when taken together with a coincident of it—for example, saying that human is one thing and pale human a distinct thing. And further, by making the state and what is said in accord with the state distinct. For what belongs to the state also belongs to what is said with respect to the state, and what belongs to what is said with respect to the state belongs to the state too. For example, since a scientific knower is said to be in a certain state with respect to scientific knowledge, "incapable of being persuaded to change by

132. Plato, *Republic* 435c–441c.

133. Because there is a form (sub-kind) of living thing—animal—to which they both belong.

argument" would not be a special affection of scientific knowledge; for then the scientific knower too will be incapable of being persuaded to change by argument.

When establishing, on the other hand, one must say that the thing a coincident belongs to is not unconditionally distinct from the coincident taken together with the thing it is a coincident of, but is said to be distinct from it because the being for each of them is distinct; for the being for human is not for a human the same thing as being for pale human is for a pale human. Further, one should look at the inflections and say that the scientific knower will not be *what* is incapable of being persuaded to change by argument, but *who* is incapable of being persuaded to change by argument, and that scientific knowledge is not *what* is incapable of being persuaded to change by argument but *which* is incapable of being persuaded to change by argument; for against the person who offers every sort of objection, one must put up every sort of resistance.[134]

5.5
Whether an Affection Assigned as Special Is in Fact Special (2)

Next, when disestablishing, look to see whether, while wishing to assign [as a special affection] what belongs by nature, the opponent posits it by his speech in such a way as to signify what always belongs; for then the proposed special affection would seem to be undermined. For example, since a person who has stated two-footed as a special affection of human wishes to assign what belongs by nature, but signifies by his speech one that belongs always, two-footed would not be a special affection of human; for not every human has two feet.

When establishing, on the other hand, look to see whether one wishes to assign as a special affection what belongs by nature, and by one's speech signifies it this way; for then the special affection will not in this respect be undermined. For example, since a person who assigns "animal receptive of scientific knowledge" as a special affection of human both wishes and by his speech signifies, the [sort of] special affection that belongs by nature, "animal receptive of scientific knowledge" would not in this respect be undermined as not being a special affection of human.

Further, it takes work to assign the special affection of whatever sorts of things are said to be so primarily with respect to something else or as themselves primarily so; for if one has assigned a special affection as belonging to what is so with respect to something else, it will also be true of what is primarily so; but if you have posited it as belonging to what is primarily so, it will also be predicated of what is so with respect to something else. For example, if one has assigned "colored" as a special affection of surface, "colored" will also be true with respect to body, while if one has assigned it

134. *What*, *who*, and *which* correspond to different inflections of the definite article in Greek, agreeing with subjects of different genders. The scientific knower is masculine (*ho*); scientific knowledge, feminine (*hê*); what is incapable of being persuaded, neuter (*to*).

as a special affection of body, it will also be predicated of surface. So it will not hold that what the account is true of, the name will also be true of.

In the case of some special affections, it for the most part happens that a certain error occurs from not determining how and of which things the special affection is posited. For everyone tries to assign as the special affection what belongs by nature (as to human, "two-footed" does); what actually belongs (as to a certain human, "having four fingers" does); what belongs to the form (as to fire, "having the finest-grained particles" does); what belongs unconditionally (as to animal, "living" does); what belongs with respect to something else (as to soul, "practically wise" does); what belongs primarily (as to the rationally calculative part, "practically wise" does); what belongs because of the subject having a certain thing (as to the scientific knower, "incapable of being persuaded to change by argument" does—for it will be because of nothing other than having a certain thing that he is incapable of being persuaded to change by argument); what belongs because the subject is had by a certain thing (as to scientific knowledge, "incapable of being persuaded to change by argument" does); what belongs because the subject is participated in by something (as to animal, "perception" does—for something else, such as human, also perceives, but because animal already participated [in it]); or what belongs because the subject participates in something (as to a certain animal, "living" does).

Someone errs, then, if he does not add "by nature," because what belongs by nature admits of not actually belonging to what it belongs to by nature (as to human, "having two feet" does). —Also if he does not determine that he is assigning what actually belongs, because it will not be such as to belong to that subject, like "having four fingers" to human. —Also if he has not made clear that he is positing it as primarily so or as so with respect to something else, because then it will not hold that what the account is true of, the name will also be true of (as is the case with "colored," whether assigned as a special affection of surface or of body). —Also, if he has not stated beforehand that he has assigned the special affection either because of the subject having a thing, or because of a certain thing having the subject, because then it will not be a special affection; for if he assigns it because of a certain thing having the subject, it will belong to what has the thing, while if he assigns it because of what has the thing, it will belong to the thing that is had (as "incapable of being persuaded to change by argument" belongs when posited as a special affection of scientific knowledge and of the scientific knower). —Also if he has not, in addition, signified that he assigns it because of the subject participating in something or because of it being participated in by something, because then the special affection will belong to certain other things as well; for if he assigns it because of the subject being participated in by something, it will belong to the participants, and if he assigns it because of its participating in something, it will belong to the things participated in (as is the case if one has posited "living" as a special affection of a certain animal and of animal). —Also if he has not explicitly distinguished the special affection as belonging to the form, because then it will belong to only one of the things that fall

under what he is positing the special affection of; for the superlative degree belongs to only one of them (as to fire, "lightest" does). Sometimes, though, one has erred even if one has added "to the form." For the things mentioned will have to be of one form when "to the form" is added. But in some cases this does not happen (as it does not in the case of fire; for there is not only one form of fire; for glowing ember, flame, and light are distinct in form, though each of them is fire).

It is because of this that, when "in form" is added, there must not be a form other than the one mentioned: because the special affection stated will belong to some things more and to others less (as in the case of fire "having the finest-grained particles" does; for light consists of finer-grained particles than ember-glow or flame does). And this should not happen unless the name too is predicated more of what the account is more true of (otherwise it will not be the case that what the account applies to more, the name also applies to more). Further, in addition to this, the same thing will be the special affection both of the unconditionally so and of the most so **135^{a}1** in respect of what is this unconditionally (as "having the finest-grained particles" is in the case of fire; for this same thing will also be a special affection of light; for it is light that has the finest-grained particles). If, therefore, someone else assigns the special affection in this way, one must attack it. But for oneself, one must not give an opening for this objection, but in positing the special affection one must immediately determine in what way one is positing the special affection.

Next, when disestablishing, look to see whether the opponent has posited a thing as a special affection of itself; for then what is proposed as being a special affection will not be a special affection. For a thing itself always indicates the being of it; and what indicates the being is not a special affection but a definition. For example, since a person who has stated "appropriate" as a special affection of noble has assigned the thing as a special affection of itself (for the noble and the appropriate are the same thing), appropriate would not be a special affection of noble.

When establishing, on the other hand, look to see whether, though one has not assigned the thing itself as a special affection of itself, one has posited as a special affection something counterpredicated; for then what has been proposed as not being a special affection will be a special affection. For example, since a person who has posited "animate substance" as a special affection of animal has not posited the thing itself as a special affection of itself, but has assigned something counterpredicated, "animate substance" would be a special affection of animal.

Next, in the case of uniform things, look to see, when disestablishing, whether the special affection of the whole is not true of the parts, or if that of a part is not said of the whole; for then what is proposed as being a special affection will not be a special affection. In some cases it happens that this occurs; for in the case of uniform things, someone might assign a special affection, sometimes looking to the whole, and sometimes giving his attention to what is said of the parts. And in neither case will the special affection be assigned correctly. For example, in the case of the whole, since a person who has stated "the greatest quantity of salt water" as a special affection

of sea has posited the special affection of something uniform, but has assigned one of such a sort as is not true of the part (for a certain sea is not the greatest quantity of salt water), "the greatest quantity of salt water" would not be a special affection of sea. In the case of the parts, for example, since a person who has posited "breathable" as a special affection of air has stated the special affection of something uniform, but has assigned one of such a sort as is true of certain air, but is not said of the whole (for the whole air is not breathable), "breathable" would not be a special affection of air.

When establishing, on the other hand, look to see whether, while it is true of each part of the uniform things, it is a special affection of them as a whole; for then what is proposed as not being a special affection will be a special affection. For example, since "by nature spatially moved downward" is true of all earth, but this is a special affection of a certain [piece of earth] by virtue of earth, "by nature spatially moved downward" would be a special affection of earth.

5.6
Opposites

Next, one must look on the basis of opposites.

First, look on the basis of contraries. When disestablishing, do so to see whether the contrary of what is proposed is not a special affection of the contrary [subject]; for then neither will the contrary be a special affection of the contrary [subject]. For example, since injustice is contrary to justice, and the worst evil to the best good, but it is not a special affection of justice to be "the best good," it would not be a special affection of injustice to be "the worst evil."

When establishing, on the other hand, look to see whether the contrary is a special affection of the contrary; for then the contrary to the first will also be a special affection of the contrary to the second. For example, since bad is contrary to good, and the worthy of avoidance to the worthy of choice, and "worthy of choice" is a special affection of good, "worthy of avoidance" would be a special affection of bad.

Second, look on the basis of relatives. When disestablishing, do so to see whether the relative [to what is proposed] is not a special affection of the relative [to the subject]; for then neither will the relative [to the subject] be a special affection of the relative [to what is proposed]. For example, since double is said of things relative to half, and exceeding to being exceeded, and "exceeding" is not a special affection of double, "being exceeded" would not be a special affection of half.

When establishing, on the other hand, look to see whether the relative [to what is proposed] is a special affection of the relative [to the subject]; for then the relative [to the subject] will also be a special affection of the relative to [what is proposed]. For example, since double is said of things relative to half, and two-to-one relative to one-to-two, and it is a special affection of two to be "as two-to-one," it would be a special affection of half to be "as one-to-two."

Third, when disestablishing, look to see whether what is said as a having is not a special affection of the having; for then neither will what is said as a privation be a special affection of the privation. Also, if what is said as a privation is not a special affection of the privation; for then neither will what is said as a having be a special affection of the having. For example, since being "the absence of perception" is not said to be a special affection of deafness, neither would being "the presence of perception" be a special affection of hearing.

When establishing, on the other hand, look to see whether what is said as a having is a special affection of the having. For then what is said as a privation will be a special affection of the privation. Also, if what is said as a privation is a special affection of the privation, what is said as a having will also be a special affection of the having. For example, since "to see" is a special affection of sight, in as much as we have sight, it would be a special affection of blindness "not to see," in as much as we do not have the sight it is natural for us to have.

Next, look on the basis of positive and negative terms.

First, on the basis of the predicates themselves. This topic is useful only when disestablishing. For example, see whether the positive predicate or what is said in terms of the positive predicate is a special affection of the subject; for then neither the negative one nor what is said in terms of the negative one will be a special affection of the subject. Also, if the negative one or what is said in terms of the negative one is a special affection of the subject, neither the positive one nor what is said in terms of the positive one will be a special affection of the subject. For example, since "animate" is a special affection of living thing, "not-animate" would not be a special affection of living thing.

Second, look on the basis of the predicates, positive or negative, and on the basis of the subjects they are affirmed or denied of. When disestablishing, do so to see whether the positive predicate is not a special affection of the positive subject; for then neither will the negative be a special affection of the negative. Also, if the negative predicate is not a special affection of the negative subject, neither will the positive be one of the positive. For example, since "animal" is not a special affection of human, neither would "non-animal" be a special affection of non-human. Also, if "non-animal" appears not to be a special affection of non-human, neither will "animal" [appear to] be a special affection of human.

When establishing, on the other hand, look to see whether the positive predicate is a special affection of the positive subject; for then the negative will also be a special affection of the negative. Also, if the negative predicate is a special affection of the negative subject, the positive will also be a special affection of the positive. For example, since "not-living" is a special affection of non-animal, "living" would be a special affection of animal. Also, if "living" appears to be a special affection of animal, "not-living" will appear to be a special affection of non-animal.

Third, look on the basis of the underlying subjects themselves. When disestablishing, do so to see whether the special affection assigned is a special affection of

the positive subject; for then the same thing will not also be a special affection of the negative subject. Also, if the special affection assigned is a special affection of the negative subject, it will not be a special affection of the positive subject. For example, since "animate" is a special affection of living thing, "animate" would not be a special affection of not-living thing.

When establishing, on the other hand, look to see whether the special affection assigned is not a special affection of the positive subject; for then it would be one of the negative subject. But this topic is false; for a positive predicate is not a special affection of a negative subject, nor a negative one of a positive one. For a positive predicate does not belong to a negative subject at all, whereas a negative predicate, while it does belong to a positive subject, does not belong as a special affection.

Next, look on the basis of the co-ordinate members of a division. When disestablishing, do so to see whether none of the co-ordinate members in the division is a special affection of any of the remaining members; for then neither will what is proposed be a special affection of what it is proposed as a special affection of. For example, since "perceptible living thing" is not a special affection of any of the other living things, "intelligible living thing" could not be a special affection of a god.

When establishing, on the other hand, look to see whether any of the remaining co-ordinate members of the division whatever is a special affection of each of these co-ordinate members; for then the remaining one will also be a special affection of what it has been proposed as not being a special affection of. For example, since it is a special affection of practical wisdom to be "intrinsically and naturally a virtue of the rationally calculative part," then, if each of the other virtues is taken in this way, it would be a special affection of temperance to be "intrinsically and naturally a virtue of the appetitive part."

5.7
Inflections and Similarity of Relations

Next, look on the basis of the inflections. When disestablishing, do so by seeing whether one inflection [of the predicate] is not a special affection of the corresponding inflection [of the subject]; for then neither will another inflection of it be a special affection of the corresponding inflection. For example, since "nobly" is not a special affection of justly, neither would "noble" be a special affection of just.

When establishing, on the other hand, look to see whether one inflection [of the predicate] is a special affection of the corresponding inflection [of the subject]; for then another inflection of it will also be a special affection of the corresponding inflection. For example, since "two-footed terrestrial" is a special affection of human,

it would be a special affection of the *by* a human to be said to be "*by* a two-footed terrestrial."[135]

Look at the inflections not only of the actual thing mentioned but also of its opposites, as was said in the case of the earlier topics as well.[136] When disestablishing, do so by seeing whether one inflection of one opposite is not a special affection of the corresponding inflection of the other opposite; for then neither will another inflection of the one be a special affection of the corresponding inflection of the other. For example, since "well" is not a special affection of justly, neither would "badly" be a special affection of unjustly.

When establishing, on the other hand, look to see whether one inflection of one opposite is a special affection of the corresponding inflection of the other opposite; for then another inflection of the one opposite will also be a special affection of the corresponding inflection of the other opposite. For example, since "best" is a special affection of the good, "worst" will also be a special affection of the bad.[137]

Next, look on the basis of similarity relations. When disestablishing, do so by seeing whether one thing that has a similarity relation to one thing is not a special affection of a second thing that has a corresponding similarity relation to a second thing; for then neither will it be a special affection of the first thing to have the relevant similarity relation to the first thing. For example, since the builder has a relation to producing a house that is similar to the one the doctor has to producing health, and it is not a special affection of the doctor to "produce health," it would not be a special affection of the builder to "produce a house."

When establishing, on the other hand, look to see whether one thing that has **137^a1** a similarity relation to one thing is a special affection of a second thing that has a corresponding similarity relation to a second thing; for then it will also be a special affection of the first thing to have the relevant similarity relation to the first thing. For example, since a doctor has a relation to being productive of health that is similar to the one the athletic trainer has to being productive of a good condition, and it is a special affection of the athletic trainer to be "productive of a good condition," it would be a special affection of the doctor to be "productive of health."

Next, look on the basis of things that have the same relations. When disestablishing, do so to see whether what has the same relation [to something] is not a special affection of it when it has the same relation [to something else]; for then neither will it be a special affection [of the first thing] to have the same relation [to the first thing]. If, on the other hand, it is a special affection [of the second thing], it will not be a special affection of what it is proposed as being a special affection of. For example,

135. The inflected forms here are datives.

136. Perhaps a reference to the topics on inflections at 114^b6–15, but more likely to those on opposites in 5.6, especially the ones on contraries (135^b7–16).

137. The lack of a morphological connection between *beltistos* (best) and *agathos* (good), *cheiristos* (worst) and *kakos* (bad), shows—and is perhaps intended to show—that inflections are not to be thought of syntactically, but semantically and also, presumably, ontologically.

since practical wisdom has the same relation to the noble and to the shameful (for it is the scientific knowledge of each of them), and it is not a special affection of practical wisdom to be "the scientific knowledge of the noble," it would not be a special affection of practical wisdom to be "the scientific knowledge of the shameful." But if it is a special affection of practical wisdom to be "the scientific knowledge of the noble," it would not be a special affection of it to be "the scientific knowledge of the shameful";[138] for it is impossible for the same thing be a special affection of several things.[139]

When establishing something, on the other hand, this topic is of no use; for what has the same relation is one thing brought into combination with several things.

Next, when disestablishing, look to see whether the predicate that is said with respect to being is not a special affection of the subject that is said with respect to being; for then neither will the predicate that is said with respect to ceasing to be, be a special affection of the subject that is said with respect to ceasing to be, nor will the predicate that is said with respect to be coming to be, be a special affection of the subject that is said with respect to coming to be. For example, since "animal" is not a special affection of human, neither would "coming to be animal" be a special affection of coming to be human, nor would "ceasing to be animal" be a special affection of ceasing to be human. In the same way, precisely as it now has been said from being to coming to be and to ceasing to be, one must also get from coming to be to being and ceasing to be, and from ceasing to be to being and coming to be.

When establishing, on the other hand, look to see whether the predicate assigned with respect to being is a special affection of the subject assigned with respect to being; for then the predicate that is said with respect to coming to be will also be a special affection of the subject said with respect to coming to be, and the predicate with respect to ceasing to be will be a special affection of the subject that is said with respect to ceasing to be. For example, since "mortal" is a special affection of human, "coming to be mortal" would be a special affection of the coming to be human, and "ceasing to be mortal" of the ceasing to be human. In the same way, one must also get from coming to be and ceasing to be to being, and to these from these, as one was told to do when disestablishing.

Next, take a look at the [Platonic] Form of what is proposed. When disestablishing, do so to see whether the special affection does not belong to the Form, or not with respect to that which it was said to be by the person who proposed it as the special affection; for then what was proposed as being a special affection will not be a special affection. For example, since "at rest" does not belong to human-itself,[140]

138. Reading οἷον ἐπεὶ . . . εἶναι αἰσχροῦ.

139. The thought seems to be that whatever makes "scientific knowledge of the noble" *alone* a special affection of practical wisdom cannot also make "scientific knowledge of the shameful" *alone* a special affection of it, since practical wisdom stands in the same relation to the noble and the shameful.

140. I.e., the Platonic Form of human. See *Met.* 1040b27–34.

insofar as it is human, but rather insofar as it is a Form, "at rest" would not be a special affection of human.

When establishing, on the other hand, look to see whether the special affection belongs to the Form, and belongs to it with respect to that which it was said to be insofar as what was proposed is not a special affection of it. For then what was proposed as not being a special affection will be a special affection. For example, since it belongs to animal-itself to be "composed of soul and body," and belongs to it insofar as it is animal, "composed of soul and body" would be a special affection of animal.

5.8
The More and the Less and Similarity of Degree

Next, look on the basis of the more and the less.

First, when disestablishing, do so to see whether the more so is not a special affection of the more so; for then neither will the less so be a special affection of the less so, nor the least so of the least so, nor the most so of the most so, nor the unconditionally so of the unconditionally so. For example, since "more colored" is not a special affection of what is more a body, neither would "less colored" be a special affection of what is less a body, nor would "colored" be one of body at all.

When establishing, on the other hand, look to see whether the more so is a special affection of the more so; for then the less so will also be a special affection of the less so, the least so of the least so, the most so of the most so, and the unconditionally so of the unconditionally so. For example, since "more perceiving" is a special affection of the more living, and "less perceiving" would be a special affection of the less living, and "most so," then, of the most so, and "least so" of the least so, and "unconditionally so" of the unconditionally so.

Also, look on the basis of the unconditionally so toward those same things. When disestablishing, do so to see whether "unconditionally so" is not a special affection of the unconditionally so; for then neither will "more so" be a special affection of the more so, nor "less so" of the less so, nor "most so" of the most so, nor "least so" of the least so. For example, since "excellent" is not a special affection of human, neither is "more excellent" a special affection of the more human.

When establishing, on the other hand, look to see whether "unconditionally so" is a special affection of the unconditionally so; for then "more so" will be a special affection of the more so, "less so" of the less so, "least so" of the least so, and "most so" of the most so. For example, since "moving spatially upward in accord with nature" is a special affection of fire, "moving more spatially upward in accord with nature" would be a special affection of what is more fire.[141] In the same way, look at all these on the basis of the others. **138a1**

141. 146a13–18.

Second, when disestablishing, look to see whether the "more" is not a special affection; for then neither will the "less" be a special affection. For example, since "perceiving" is more a special affection of living thing than "scientifically knowing" is of human, and "perceiving" is not a special affection of living thing, "scientifically knowing" would not be a special affection of human.

When establishing, on the other hand, look to see whether the "less" is a special affection; for then the "more" will also be a special affection. For example, since to be by nature "tame" is less a special affection of human than "living" is of animal, and it is a special affection of human to be "tame by nature," "living" would be a special affection of animal.

Third, when disestablishing, look to see whether the special affection [proposed] is not a special affection of what it is more a special affection of; for then neither will it be a special affection of what it is less a special affection of; but if it is a special affection of the first, it will not be a special affection of the second. For example, since "colored" is more a special affection of surface than of body, and it is not a special affection of surface, "colored" would not be a special affection of body, while if it is a special affection of surface, it would not be a special affection of body.

When establishing, on the other hand, this topic is not useful; for it is not possible for the same thing to be a special affection of several things.

Fourth, when disestablishing, look to see whether what is more a special affection of a given subject is not a special affection of it; for then neither will what is less a special affection of it be a special affection of it. For example, since "perceptible" is more a special affection of animal than "divisible"[142] is, and "perceptible" is not a special affection of animal, neither would "divisible" be a special affection of animal.

When establishing, on the other hand, look to see whether what is less a special affection of a given subject is a special affection of it; for then what is more a special affection of it will be a special affection. For example, since "perceiving" is less a special affection of animal than "living" is, and "perceiving" is a special affection of animal, "living" would be a special affection of animal.[143]

Next, look on the basis of special affections that belong in a similar way. First, when disestablishing, to see whether what is a special affection in a similar degree is not a special affection of that of which it is a special affection in a similar degree; for then neither will what is a special affection in a similar degree be a special affection of that of which it is a special affection in a similar degree. For example, since "appetitive desiring" is a special affection of the appetitive part[144] in a degree similar to that in which "rational calculating" is a special affection of the rationally calculative part, and "appetitive desiring" is not a special affection of the appetitive

142. *DA* 411[b]19–21.

143. Animals are always living, but not always perceiving.

144. The appetitive part is not always appetitively desiring.

part, neither would "rationally calculating" be a special affection of the rationally calculating part.

When establishing, on the other hand, look to see whether what is a special affection in a similar degree is a special affection of that of which it is a special affection in a similar degree; for then what is a special affection in a similar degree will also be a special affection of that of which it is a special affection in a similar degree. For example, since "the primary locus of practical wisdom" is a special affection of the rationally calculative part in a degree similar to that in which "the primary locus of temperance" is a special affection of the appetitive part, and "the primary locus of practical wisdom" is a special affection of the rationally calculative part, "the primary locus of temperance" would be a special affection of the appetitive part.

Second, when disestablishing, look to see whether what is in a similar degree a special affection of a given subject is not a special affection of it; for then neither will what is in a similar degree a special affection be a special affection of it. For example, since it is in a similar degree that "seeing" and "hearing" are special affections of human, and "seeing" is not a special affection of human, neither would "hearing" be a special affection of human.

When establishing, on the other hand, look to see whether what is in a similar degree a special affection of it is a special affection of it; for then what is in a similar degree a special affection of it will be a special affection of it. For example, since "appetitive due to a part of itself being primarily so" is in a similar degree a special affection of soul as "rationally calculative due to a part of itself being primarily so," and it is a special affection of soul to be "appetitive due to a part of itself being primarily so," it would be a special affection of soul to be "rationally calculative due to a part of itself being primarily so."

Third, when disestablishing, look to see whether it is not a special affection of what it is in a similar degree a special affection of; for then neither will it be a special affection of what it is in a similar degree a special affection of; while if it is a special affection of the first, it will not be a special affection of the second. For example, since "to burn" is to a similar degree a special affection of flame and glowing ember, and "to burn" is not a special affection of flame, "to burn" would not be a special affection of glowing ember, while if it is a special affection of flame, it would not be a special affection of glowing ember.

When establishing, on the other hand, this topic is not at all useful.

The topic based on similarity relations[145] differs from the one based on special affections that belong in a similar degree, because the former is got hold of by analogy, not by looking at the belonging of some affection, while the latter is based on what belongs being brought into combination with other things.

145. $136^{b}33$–$137^{a}7$, $138^{a}30$–$^{b}22$.

5.9
Capacities and Superlatives

Next, when disestablishing, look to see whether, in assigning the special affection as a capacity, the opponent has not assigned the special affection also as a capacity in relation to what is not, when the capacity does not admit of belonging to what is not; for then what is proposed as being a special affection will not be a special affection. For example, since a person who has stated "breathable" as a special affection of air has, on the one hand, assigned the special affection as a capacity (for the breathable is the sort of thing that can be breathed), and, on the other hand, has assigned the special affection also in relation to what is not (for air in fact admits of being even though no animal is of a sort to naturally breathe the air; yet if no animal is, nothing can breathe; so neither will it be a special affection of air to be "the sort of thing that can be breathed at a time when there is no animal of the sort that can breathe it")—[since all that is so,] it would not be a special affection of air to be "breathable."

When establishing, on the other hand, look to see whether in assigning the special affection as a capacity, one assigns the special affection either as a capacity in relation to what is or—when the capacity admits of belonging to what is not—in relation to what is not; for then what is proposed as not being a special affection will be a special affection. For example, since a person[146] who assigns "capable of being affected or of affecting" as a special affection of what is assigns the special affection as a capacity, and has assigned the special affection in relation to what is (for when what is, is, it will be capable of being affected or of affecting in some way), so that "capable of being affected or of affecting" would be a special affection of what is.

Next, when disestablishing, look to see whether the opponent has posited the special affection as a superlative; for then what is proposed as being a special affection will not be a special affection. For the result for those who assign the special affection in this way is that what the name is true of, the account is not true of; for when the thing has passed away, nonetheless the account will be [true of something]; for it will belong most of all to things that are. For example, if someone were to assign "the lightest body" as a special affection of fire; for if fire has passed away, there will still be some body that is the lightest. So "the lightest body" would not be a special affection of fire.

When establishing, on the other hand, look to see whether one has not posited the special affection as a superlative; for then the special affection will in this respect be correctly proposed. For example, since a person who has posited "by nature a tame animal" as a special affection of human has not assigned the special affection as a superlative, the special affection would in this respect be correctly proposed.

146. Plato, *Sophist* 247e.

BOOK 6

6.1
Definitions

Where definitions are concerned, the study has five parts; for one must prove that it is not true at all to apply the account also to what the name applies to (for the definition of human must be true of every human); that though the subject to be defined has a kind, the opponent has not put it in the kind, or has not put it in its proper kind (for the definer must put the subject in the kind and then attach the differences; for of the things in the definition the kind seems most of all to signify the substance of the thing defined); that the account is not special (for the definition must be special, as was said previously[147]); that, though having done all the things mentioned, he has not given a definition, that is, not stated the essence of the thing defined. And beyond the things mentioned it remains to see whether, though he has given a definition, he has not given it correctly.

Whether, then, the account is not also true of what the name is true of, should be looked at on the basis of the topics related to the coincident;[148] for there too the looking is always to see whether it is true or not true [of the thing]. For when we argue dialectically that a coincident belongs, we say that it is true, and when it does not belong, that it is not true. If the opponent has not put the subject in its proper kind, however, or if the assigned account is not special to the subject, one must look at it on the basis of the topics related to the kind and the special affection.[149]

It remains to state how one must proceed to say whether the thing has either not been defined or not defined correctly. First, then, one must look to see whether it has not been defined correctly. For it is easier to do anything whatever than to do it correctly. It is clear, then, that error is more frequent where the latter is concerned, since it is more arduous work. So attack is easier where it is concerned than where the former is concerned.

Not defining correctly has two parts. One consists in doing so by using an expression that is not perspicuous (for the definer must use the most perspicuous expression possible, since it is for the sake of making the thing known that the definition is being assigned). The second is if he has stated the account in a more extended version than is necessary; for any additional component in the definition is superfluous. And each of the ones mentioned is again divided into several parts.

147. 101b19–23.
148. 102b4–26, 102b29–35, 155a28–36.
149. Books 4 and 5.

6.2
Non-perspicuously Expressed Definitions

One topic concerned with what is not perspicuously expressed is look to see whether what is said is homonymous with something—for example, if someone[150] says that coming to be is a leading into being, or that health is a balance of hot things and cold things; for leading is homonymous, and so is balance. It is unclear, then, which of the things indicated by what is said in several ways the opponent wishes to state. It is the same way too if the thing defined is said in several ways and he has stated [the definition] without distinguishing them; for then it is unclear of which of them he proposes the definition, and it is also possible to make a trivial objection to it on the grounds that the account does not fit everything he has given the definition of. It is especially possible to make one of this sort when the homonymy is unnoticed. But it is also possible for someone to distinguish himself the various ways in which what is assigned in the definition is stated, and produce a pertinent deduction; for if it is adequately stated in none of the ways, it is clear that he would not have defined it properly.

Another topic is to look to see whether the definer has stated it metaphorically—for example, if he has defined scientific knowledge as "inflexible," or the earth as a "nurse," or temperance as a "harmony";[151] for everything stated metaphorically lacks perspicuousness. Also, it is possible to make a trivial objection to what is stated metaphorically by supposing it to have been stated literally; for then the definition stated will not fit—for example, in the case of temperance; for all harmony consists of notes. Further, if harmony is the kind of temperance, the same thing will be in two kinds, neither of which encompasses the other; for harmony does not encompass virtue, nor virtue harmony.

Further, look to see whether he uses names that are not established, as when Plato[152] defines the eye as "brow-shaded," or the poisonous spider as "bite-necrotic," or marrow as "bone-produced"; for everything that is not customary is non-perspicuous.

But there are some things that are stated neither homonymously nor metaphorically—for example, that the law is a measure or likeness of what is by nature just. Things of this sort are worse than metaphors. For a metaphor in a way makes known the thing it signifies, because of the similarity involved (for all makers of metaphors make their metaphors in accord with a certain similarity), while something of this sort does not make anything known; for there is no similarity in accord with which the law is a measure or likeness, nor is it customarily said to be such in the literal sense. So, if someone says that the law is literally a measure or a likeness, he speaks falsely (for a likeness is something whose coming to be is through an imitation, and

150. Plato, *Sophist* 219b.
151. Plato, *Republic* 430e.
152. The comic Athenian poet.

this is not a feature that belongs to the law). If, on the other hand, it is not literally so, it is clear that he has said something non-perspicuously, and something worse than anything said metaphorically.

Further, look to see whether the account of the contrary is not clear on the basis of what is said; for correctly assigned definitions signify the accounts of the contraries as well. Or, look to see whether, when it is stated by itself, it is not evident what it is the definition of, but rather, like the figures in old-style painters: unless there was an inscription, one used not to recognize who each of them was.

6.3
Definitions Involving Superfluous Material

If, then, the definition is not expressed perspicuously, look at it on the basis of topics such as the preceding ones.

If, on the other hand, the definer has stated the definition in too extended a form, first, look to see whether he has made use of anything that belongs to everything, either to the beings in general, or to those that fall under the same kind as the thing defined; for then it is necessarily stated in too extended a version. For the kind must separate the thing defined from the other things, and the difference must separate it from the ones in the same kind. But what belongs to everything separates it from simply nothing, while what belongs to everything that falls under the same kind does not separate it from those in the same kind, so that this sort of addition is pointless.

Or, again, look to see whether, though the addition is special [to the thing defined], yet, when it is subtracted, the remainder of the account is also special and indicates the substance. For example, in the account of human the addition of "receptive of scientific knowledge" is superfluous; for when it is subtracted the remainder of the account is special and indicates the substance. Simply speaking, anything is superfluous if, when it is subtracted, the remainder makes clear the thing defined. The definition of soul would be of this sort, if indeed it is "number that moves itself";[153] for in fact the soul, as Plato has defined it,[154] is "what moves itself." Alternatively, perhaps what is stated, though special, does not indicate the substance if "number" is subtracted. Which of these holds is difficult to determine perspicuously. But in all such cases one must have an eye to what is advantageous—for example, saying that the definition of phlegm is "the first fluid, produced from nourishment that is unconcocted."[155] For only one thing is first, not many, so that unconcocted is superfluous; for in fact when it is subtracted, the remainder is a special account; for it is not possible for both phlegm and something else to be the first thing to come from the nourishment. Alternatively, perhaps phlegm is not unconditionally the first thing

153. Xenocrates, F85 Isnardi.
154. *Phaedrus* 245e, *Laws* 895e–896a.
155. *GA* 725^{a}15–16.

to be produced from the nourishment, but only the first of the unconcocted ones, so that unconcocted must be added (for stated the other way the account will not be true, if indeed phlegm is not the first of all).

Further, look to see whether something in the account does not belong to all the things that fall under the same form; for an account of this sort defines in a worse way than those that make use of something that belongs to everything; for in the latter way, if the remainder of the account is special, all of it will be special; for it is unconditionally the case that if anything whatever that is true is added to what is special, the whole account becomes special. But if something in the account does not belong to everything that falls under the same form, it is impossible for the whole account to be special; for it will not be counterpredicated of the thing at issue. For example, "two-footed terrestrial animal six feet tall"; for such an account is not counterpredicated of the thing at issue, because six feet tall does not belong to everything that falls under the same form.

Again, look to see whether the definer has said the same thing several times—for example, saying that appetite is a desire for something pleasant; for all appetite is for something pleasant, so that what is the same as appetite will be for something pleasant. [The definition of appetite] becomes, then, "the desire for something pleasant for something pleasant"; for there is no difference between saying appetite and saying the desire for something pleasant, so that either will be for something pleasant.

Alternatively, perhaps this involves no absurdity; for human is also two-footed animal, so that what is the same as human will also be two-footed, but two-footed terrestrial animal is the same as human, so that two-footed terrestrial animal is two-footed. But nothing absurd comes about because of this; for two-footed is not predicated of terrestrial animal (for in this way two-footed would be predicated twice of the same thing); rather, it is about a two-footed terrestrial animal that two-footed is said, so that two-footed is only predicated once. And the case of appetite is similar; for it is not of desire that being for pleasure is predicated but of the whole thing, so that here too the predication occurs only once.

Absurdity results, not when the same name is uttered twice, but when the same thing is predicated of something several times, as happens when Xenocrates says[156] that wisdom is [a science that] defines, and gets a theoretical grasp on, the beings; for a science that defines something is the sort of science that gets a theoretical grasp on it, so that he is saying the same thing twice, when he again adds "and gets a theoretical grasp on." It is the same way too with those who say that coldness is a privation of heat in accord with nature; for every privation is a privation of what belongs in accord with nature, so that it is superfluous to add "in accord with nature," but was enough to say "a privation of heat," since the "privation" itself makes it known that what is meant is the heat in accord with nature.

156. F3 Isnardi.

Again, look to see whether, after a universal has been stated, the definer has added a particular case as well—for example, if one has defined decency as "taking less than one's share of the advantageous and the just";[157] for the just is a sort of advantage.[158] For after stating the universal, he has added a particular case. Also, if he has defined medicine as "scientific knowledge of what is healthy for animal and human," or law as "a likeness of what is by nature noble and just"; for the just is something noble, so that he is saying the same thing several times.

6.4
Whether a Definition Defines an Essence

Whether a definition is given correctly or incorrectly, then, should be looked at by means of these and these sorts of topics. But whether the opponent has defined the essence or not must be looked at on the basis of the following ones.

First, look to see whether he has not produced the definition through prior and better-known things. For since a definition is assigned for the sake of knowing the thing stated, and we know not on the basis of random things, but rather on the basis of prior and better-known ones, just as in the case of demonstrations (for this holds of all teaching and learning), it is evident that the person who has not defined it through such things has not defined it at all. Otherwise, there will be more than one definition of the same thing; for it is clear that a person who has defined it through prior and better known things has also defined it and done so better, so that both would be definitions of the same thing. But they do not seem to be such; for what is precisely the being for each of the beings is one thing. So, if there are several definitions of the same thing, what is precisely the being for the thing defined will be the same as each of the things indicated by the definitions. But these things are not the same, since their definitions are distinct. It is clear, then, that a person who has not **141b1** defined through prior and better-known things has not defined at all.

The fact that the definition has not been stated through better known things may be taken in two ways; for either it is produced from things that are unconditionally less well known or less well known to us; for both ways are possible. Unconditionally, what is prior is better known than what is posterior—for example, a point than a line, a line than a plane, and a plane than a solid, just as a unit is more so than a number; for it is prior to and a starting-point of all number. Similarly, a letter is more so than a syllable. To us, on the other hand, it sometimes happens that the reverse is the case; for the solid falls most under perception, the plane more than the line, the line more than the point. For ordinary people know things of the former sort earlier; for to

157. Plato, ††*Definitions* 412b.
158. *Pol.* 1279a17–19.

learn them is a task for random thought, while to learn the others is a task for exact and extraordinary thought.

Unconditionally, then, it is better to try to make what is posterior known through what is prior; for proceeding in this way is more scientific. Nonetheless, in relation to those who cannot know through things of the latter sort, it is presumably necessary to produce the account through things known to them. Among definitions of this sort are the following ones of the point, the line, and the plane; for all of them indicate prior things through posterior ones; for they say that the point is the limit of the line, the line of the plane, and the plane of the solid. One must not overlook, however, that it is not possible for those who define in this way to indicate the essence of the thing defined, unless it so happens that the same thing is both better known both to us and also unconditionally better known,[159] if indeed a correct definition must define through the kind and the differences, and these are among the things that are unconditionally better known than the form and prior to it. For the kind and the difference do away with the form,[160] so that these are prior to the form. They are also better known; for if the form is known, it is necessary for both the kind and the difference to be also known (for a person who knows human knows both animal and terrestrial), while if the kind or the difference is known, it is not necessary for the form to be known, so that the form is less well known.

Further, those who say that definitions of this sort—those produced from things known to a given person—are in accord with the truth will, as a result, have to say that there are many definitions of the same thing; for different things happen to be better known to different people, not the same things to all, so that a distinct definition would have to be given to each one, if indeed the definition must be produced from things that are better known to each.

Further, to the same people distinct things are better known at distinct times—initially, perceptible things, then, as they become more exact [knowers], the reverse, so that neither must the same definition always be given to the same person by those who say that a definition must be given through the things that are better known to each one.

It is clear, then, that one must not define through these sorts of things, but rather through those that are unconditionally better known; for only in this way would one and the same definition always result. But presumably what is unconditionally known is also what is known not to everyone, but rather to those with good dispositions where their thought is concerned, just as what is unconditionally healthy is what is so to those in a good state where their body is concerned.

Each point of this sort, then, must be made exact, but made use of with an eye to what is advantageous in arguing dialectically. But it is most of all agreed to be possible

159. Cf. *Rh.* 1358ᵃ23–26.

160. I.e., when they are done away with themselves.

to do away with a definition if the definer has produced his account neither from what is unconditionally better known nor from what is better known to us.

One way, then, of not defining by means of things that are better known is to indicate what is prior through what is posterior, as we said previously.[161] Another is if the definer has assigned his account to us of what is at rest and definite through what is indefinite and in movement; for what remains at rest and what is definite is prior to what is indefinite and in movement.[162]

There are three ways of not proceeding from things that are prior. The first is when an opposite has been defined through its opposite—for example, good through bad; for opposites are by nature simultaneous. To some people too it seems that the science of both is the same, so that the one is not better known than the other either. One must not fail to notice, however, that it is presumably impossible to define some things in any other way—for example, the double without the half, and whatever is said to be intrinsically relative to something. For the being for all such things is the same as having some sort of relation to something, so that it is impossible to know the one without the other. That is why it is necessary for the one to be included in the account of the other. We must, then, know all the things of this sort, and make use of them as seems to be advantageous.

Another way is when the definer has made use of the thing defined itself. This goes unnoticed when the name of the thing defined itself is not used—for example, if he[163] has defined the sun as "star that shines by day"; for in using day, he makes use **142^{b}1** of the sun. To uncover these sorts of things, one should substitute the account for the name—for example, that day is the spatial movement of the sun over the earth; for it is clear that a person who has spoken of the spatial movement of the sun over the earth has spoken of the sun, so that in using day, he has made use of the sun.

Again, look to see whether he has defined one co-ordinate member of a division by means of another co-ordinate member—for example, odd number as "one greater by a unit than an even number." For the co-ordinate members of a division drawn from the same kind are by nature simultaneous; and odd and even are co-ordinate members, since both are differences of number.

Similarly, look to see whether he has defined a higher one through a lower one—for example, even number as "what is bipartitely divisible"; or good as "a state of virtue"; for bipartitely is derived from two, which is an even number, and virtue is a sort of good, so that the former are lower than the latter. Further, in making use of what is lower than a thing, one will necessarily make use of the thing itself as well. For a person who makes use of virtue, makes use of good, since virtue is a sort of good, and, similarly, a person who makes use of bipartitely makes use of even, since "bipartitely divisible" signifies divisible by two, and two is an even number.

161. 141^{a}26–^{b}34.
162. *Met.* 1039^{b}31–1040^{a}7.
163. Plato, ††*Definitions* 411b.

6.5
Kind

Speaking in universal terms, then, one topic is not producing the account through things that are prior and better known, and its parts are the ones mentioned.[164] A second is to see whether, though the thing at issue is in a kind, it is not proposed in the kind. This sort of error is found in all cases in which the what-it-is is not proposed first in the account—for example, in the definition of body as "what has three dimensions," or the definition of human, if someone were to define it as "what scientifically knows how to count." For it has not been stated what it is that has three dimensions, or what it is that scientifically knows how to count. The kind, on the other hand, is meant to signify the what-it-is, and, of the things mentioned in the definition, is put first.

Further, look to see whether, though the thing defined is said in relation to several things, the definer has not applied it in relation to all of them—for example, if he has defined grammar as "the scientific knowledge of writing from dictation"; for he should add that it is also that of reading. For a person who assigns "the scientific knowledge of writing" as the definition has no more defined it than one who assigns "the scientific knowledge of reading." So neither of them has defined it, but only the one who has stated both of these things, since there cannot be several definitions of the same thing. In some cases, certainly, what has been said is in accord with the truth, but in some cases it is not—for example, in those in which the definition is not said in relation to both things intrinsically, as when medicine is defined as "what produces health and disease"; for it is said in relation to the first intrinsically, but in relation to the second coincidentally; for, unconditionally, it is foreign to medicine to produce disease. So a person who assigns it in relation to both has no more defined it than a person who assigns it in relation to one of the two. On the contrary, he has presumably done even a worse job, since any practitioner whatever of the remaining ones is capable of producing disease.

Further, look to see whether, though the thing defined is said in relation to several things, the definer has assigned it not in relation to the better but in relation to the worse; for every science and capacity seems to be of what is best.

Again, if what is mentioned is not proposed in its proper kind, look at it on the basis of the elements concerned with the kind, as was stated previously.[165]

Further, look to see whether the definer states the definition in a way that jumps over the kinds—for example, if he defines justice as "the state productive of equality or allocative of what is equal"; for a person who defines in this way jumps over virtue. Leaving out the kind of justice, then, he does not state the essence; for the substance of each thing involves its kind. This is the same as not putting the thing in the closest

164. 141a26–142b19.
165. 139b3–5.

kind; for a person who puts it in the closest one has stated all the higher ones, since all the higher kinds are predicated of the lower ones. So, either it must be put in the closest kind, or else all the differences, through which the closest kind is defined, must be attached to the higher kind; for this way nothing would be omitted, but rather instead of the name, the account of the lower kind would be stated. But a person who states only the higher kind by itself does not state the lower kind as well; for the one who states "plant" does not state "tree."

6.6
Difference

Again, in the case of differences, one must in a similar way look to see whether the definer has mentioned the differences that are those of the kind. For if he has not defined the thing at issue by the differences special to it, or has mentioned a sort of thing that does not at all admit of being a difference of anything (for example, animal or substance), it is clear that he has not defined it; for the things mentioned are not differences of anything whatever. Also, see whether there is anything co-ordinate in a division with the difference mentioned. For if there is not, it is clear that the one mentioned would not be a difference of the kind; for every kind is determined by differences that are co-ordinate members of a division, just as animal is by terrestrial and winged. Or else, see whether, though there is a co-ordinate difference, it is not **143b1** true of the kind. For it is clear that neither of them would be a difference of the kind; for all the co-ordinate differences are true of their proper kind. In a similar way, look to see too whether, though the co-ordinate difference is true of the kind, its being added to it does not make a form. For then it is clear that it would not be a difference of the kind; for every difference, together with the kind, makes a form. If, however, it is not a difference, what is mentioned as a difference would not be a difference either, since it is a co-ordinate of it in a division.

Further, look to see whether he divides the kind by a negation, as those do who define line as "length without breadth"; for this signifies nothing other than that it does not have breadth. The result, then, will be that the kind participates in the form;[166] for every length either is without breadth or has breadth, since of everything either the affirmation or the negation is true, so that the kind of line, which is length, will also either be without breadth or have breadth. But "length without breadth" is the account of a form, as, likewise, is "length having breadth." For without breadth and having breadth are differences, and the account of the form is composed of the difference and the kind, so that the kind would admit of the account of the form. Similarly, it would also admit of the account of the difference, since one or other of the differences just mentioned is of necessity predicated of the kind.

166. Which is impossible. See 121a13–14.

The topic just mentioned is useful against those who posit the existence of Forms. For if there is length-itself, in what way is it to be predicated of the kind having breadth or without breadth? For one or the other of these must be true of every length, if indeed it is going to be true of the kind. But this does not happen; for there are lengths without breadth and lengths having breadth. So this topic is useful only against those who say that every kind is one in number. This, though, is what those who posit the Forms do say; for they say that the kind is length-itself or animal-itself.[167]

But perhaps in some cases it is necessary for the definer to use a negation—for example, in the case of privations; for blind is not having sight when it is natural to have it. But there is no difference between dividing a kind by a negation and by means of the sort of affirmation that must necessarily have a negation as its co-ordinate in a division—for example, if he has defined something as "length having breadth"; for co-ordinate in the division with having breadth is not having breadth, and nothing else, so that again the kind is divided by a negation.

Again, look to see whether he has assigned the form as a difference, as do those who define insolence as "wanton aggression accompanied by satirizing"; for satirizing is a sort of wanton aggression, so that satirizing is not a difference but a form.

Further, look to see whether he has stated the kind as a difference—for example, stating that virtue is a good or excellent state; for good is the kind of virtue. Alternatively, perhaps good is not the kind but the difference, if indeed it is true that the same thing does not admit of being in two kinds, neither of which encompasses the other. For good does not encompass state, nor state good; for not every state is good, nor is every good a state. So they would not both be kinds. If, then, state is the kind of virtue, it is clear that good is not its kind but rather a difference. Further, "state" signifies the what-it-is of virtue, while "good" signifies not what it is but a quality; and a difference seems to signify a quality.[168]

See too whether the assigned difference signifies not a quality but a this something; for it seems that every difference indicates a certain quality.

Look to see too whether the difference belongs coincidentally to the thing defined. For no difference is among the things that belong coincidentally, just as no kind is either; for a difference does not admit of belonging to something and of not belonging to it.

Further, if the difference, the form, or any of the things under the form is predicated of the kind, the thing would not have been defined; for none of the things just mentioned admits of being predicated of the kind, since the kind has the widest extension of all of them. Again, look to see whether the kind is predicated of the difference; for the kind seems to be predicated not of the difference but of the things the difference is predicated of—for example, animal is predicated of human, ox, and other terrestrial animals, not of the difference itself that is said of the form. For if "animal" is going to be predicated of the differences one by one, many animals would

167. Since something is in the kind F by participating in the F-itself.
168. 122b16–17, 128a26–27.

be predicated of the form; for the differences are predicated of the form.[169] Further, all differences will be either forms or individuals, if they are animals; for each animal **144^{b}1** is either a form or an individual.

In a similar way, look to see too whether the form or any of the things under the form is predicated of the difference; for this is impossible, since the difference has a 5 wider extension than the forms.[170] Further, the result will be that the difference is a form, if indeed any of the forms is predicated of it; for if "human" is predicated, it is clear that the difference is [predicatively] human. Again, look to see whether the difference is prior or not prior to the form; for the difference must be posterior to the kind but prior to the form.[171] 10

Look to see whether the stated difference also belongs to a distinct kind, neither encompassed by nor encompassing the first; for the same difference does not seem to belong to two kinds neither of which encompasses the other. Otherwise the result will be that the same form will also be in two kinds neither of which encompasses the other. For each of the differences imports its own proper kind—for example, 15 terrestrial and two-footed import animal along with them. So, if what the difference is predicated of, both of the kinds are also predicated of, it is clear that the form is in two kinds neither of which encompasses the other. Alternatively, perhaps it is not impossible for the same difference to belong to two kinds neither of which encom- 20 passes the other. But "if they do not both fall under the same [kind]" must be added. For "terrestrial" and "winged" are kinds neither of which encompasses the other, and two-footed is a difference of both of them, so that it must be added that they do not both fall under the same [kind]; for they both fall under "animal." It is also clear that 25 it is not necessary for a difference to import every proper kind along with it (since the same difference admits of belonging to two kinds neither of which encompasses the other), but only that it import one or other of the two along with it, as well as all of the higher kinds, just as two-footed imports either winged or terrestrial along with it. 30

See also whether the definer has assigned being in something as a difference of substance; for it seems that one substance does not differ from another by where it is. That is also why people criticize those who divide animals by terrestrial and aquatic,

169. The argument is apparently this: D_1, D_2, and D_3 are the differences of a form S, so that $S = D_1 + D_2 + D_3$. Animal is predicated of D_1, and of D_2, and of D_3 one by one. But because $D1 \neq D2 \neq D3$, the animal that is predicated of them in this way must be a distinct animal in each case, so that the A_1 predicated of $D_1 \neq$ the A_2 predicated of $D_2 \neq$ the A_3 predicated of D_3. (For otherwise D_1, D_2, and D_3 would be one and the same animal, and so would be numerically identical.) Since $S = D_1 + D_2 + D_3$, it follows that $S = A_1 + A_2 + A_3$, so that many distinct animals are predicated of S.

170. The assumption, as in the previous topic, is that the form S is defined by a number of distinct differences, D_1, D_2, and D_3, each of which, taken one by one, has a wider extension than S.

171. The extension of the kind is wider than that of the difference, so that doing away with the kind does away with the difference, but not vice versa, making the kind prior (123^{a}14–15). Similarly, the extension of the difference is wider than the form, making it prior to the form (122^{b}35–123^{a}1).

on the supposition that "terrestrial" and "aquatic" signify the where. Alternatively, perhaps they do not criticize in a correct way; for "aquatic" does not signify "in something" or "where," but a certain quality.[172] For even if the thing is on land, it is nonetheless aquatic. Similarly, a land animal, even if it is in water, will be a land animal, not an aquatic animal. Nonetheless, if the difference ever does signify being in something, it is clear that the definer will have made an error.

Again, look to see whether he has assigned an affection as a difference; for every affection, if it becomes more intensified, utterly alters the substance, but a difference is not like this; for it seems that a difference rather preserves what it is a difference of, and that it is unconditionally impossible for a given thing to be without its own proper difference; for if terrestrial does not exist, human will not exist. And, simply speaking, none of the things with respect to whose possession something undergoes alteration is a difference of it; for all things of this sort, if they become more intensified, utterly change the substance. So, if the definer has assigned anything of this sort as difference, he has made an error. For, unconditionally, we undergo no alteration with respect to our differences.

Also, look to see whether he has not assigned the difference of a relative as relative to something else. For the differences of relatives are themselves relatives—for example, those of scientific knowledge. For it is said to be theoretical, practical,[173] and productive. And each of these signifies a relative. For it is theoretical scientific knowledge of something, productive scientific knowledge of something, and practical scientific knowledge of something.[174]

Look to see too whether the definer assigns each relative as relative to its natural correlative. For in some cases it is possible to use the thing only in relation to the natural one, and in relation to nothing else, while in others it is also possible to use it in relation to something else—for example, the eye can only be used for seeing, but a strigil can also be used as a sort of instrument for drawing off liquid. Nonetheless, if someone had defined a strigil as "an instrument for drawing off liquid," he would have made an error; for that is not its natural correlative. And the definition of a natural correlative is "that for which a practically wise person, and the science proper to the given thing, would use it."

Or again, look to see whether he has not assigned it to the primary correlative, when the thing happens to be said in relation to several—for example, if he has defined practical wisdom as "the virtue of a human or of a soul and not of the rationally calculative part"; for practical wisdom is primarily the virtue of the rationally calculative part; for it is in accord with this that the soul and the human being are said to be practically wise.

Further, if what the thing defined has been stated to be an affection or disposition of is not receptive of it, he has made an error; for every disposition and every affection

172. I.e., a difference. See 144ᵃ18–19.
173. Reading καὶ πρακτικὴ. See 157ᵃ10–11.
174. Reading καὶ πρακτικὴ τινός.

naturally comes to be in what it is a disposition or an affection of—for example, scientific knowledge in the soul, since it is a disposition of soul. But sometimes people make errors in cases of this sort—for example, those who say that sleep is an incapacity of perception, that puzzlement is equality of contrary rational calculations, **$145^{b}1$** or that pain is the splitting apart of naturally grown-together parts, involving force. For sleep does not belong to perception (though it should belong to it, if indeed it is incapacity of perception), and neither, likewise, does puzzlement belong to rational calculations, nor pain to naturally grown-together parts; for inanimate things will feel pain, if indeed pain will be present in them. The definition of health is also of this sort, if indeed it is "a balance of hot and cold things"; for then it is necessary for the hot and cold things to be healthy. For a balance of a given thing belongs in each of the things of which it is the balance, so that health would belong to them. Further, the result for those who define in this way is that what is produced is put in what is productive of it, or the reverse. For the splitting apart of naturally grown-together parts is not pain, but productive of pain, and incapacity of perception is not sleep either, but one is productive of the other; for either we go to sleep because of the incapacity, or we have the incapacity because of sleep. Similarly too, equality of contrary rational calculations would seem to be productive of puzzlement; for when we are rationally calculating both ways [of doing something], and everything that comes about appears to be similar either way, we are puzzled about which of the two to do in action.

Further, look at all the periods of time to see whether there is a discordance somewhere—for example, if immortal has been defined as "animal *aphtharton* now"; for an animal now *aphtharton* will be [only] now immortal [but not at other times]. Alternatively, perhaps this does not follow in this case; for "now *aphtharton*" is ambiguous; for it either signifies that the thing has not passed away now or that it is not capable of passing away now, or that it is now of a sort never to have passed away. When, then, we say that an animal is *aphtharton* now, we mean this: that it is now an animal of a sort never to pass away. But this latter was the same as saying that it is immortal, so that it does not follow that it is now immortal [but not at other times]. Nonetheless, if it happens that what is assigned in accord with the account belongs now or earlier [but not at other times], but what is assigned in accord with the name does not belong [in that way], they would not be the same thing. The topic must, then, be used in the way stated.

6.7
The More and the Less

Look to see too whether the thing defined is said more in accord with something else than in accord with the assigned account—for example, if justice is defined as "capacity allocative of what is equal." For a just person is more one who deliberately chooses to allocate equally than one capable of it, so that justice would not be

146ª1 capacity allocative of what is equal; for then a person who is capable of allocating equally would also be most just.

Further, when the thing at issue admits of the more, look to see whether the one in accord with the assigned account does not admit of it, or—the reverse—whether the one in accord with the assigned account does admit of it, while the thing at issue does not; for either both must admit of it or neither, if indeed what is assigned by the account is the same as the thing at issue. Further, look to see whether, though both admit of the more, they do not both get the increase simultaneously—for example, if love is defined as "appetite for sexual intercourse"; for a person who is more in love does not have more appetite for sexual intercourse, so that they do not both admit of the more simultaneously.[175] But they certainly would have to, if indeed they were the same thing.

Further, two things being proposed, look to see whether what the thing at issue is more said of, the account is less said of—for example, if fire is defined as "the most fine-grained body." For flame is fire more than light is, while flame is the most fine-grained body less than light is. But both should have belonged more to the same thing, if indeed they were the same. Again, look to see whether one belongs in a similar way to both of the things proposed, while the other does not belong in a similar way to both, but more to one of them.

Further, look to see whether he assigns the definition in relation to two things, taken severally—for example, if he defines beautiful as "pleasant to sight or pleasant to hearing,"[176] or being as "capable of being affected or capable of affecting"; for then the same thing will be both beautiful and not beautiful, and likewise, will both be and not be. For pleasant to hearing will be the same as beautiful, so that not pleasant to hearing will be the same as not beautiful; for the opposites of things that are the same are themselves the same, and not beautiful is the opposite of beautiful, and not pleasant to hearing the opposite of pleasant to hearing. It is clear, then, that not pleasant to hearing is the same as not beautiful. If, then, something is pleasant to sight but not to hearing, it will be both beautiful and not beautiful. And in a similar way we will prove that the same thing both is and is not.

Further, of kinds, differences, and all the other things assigned in definitions, put accounts in place of names and look to see whether there is any discordance.

6.8
Definitions of Relatives

If the thing defined is a relative, either intrinsically or with respect to its kind, look to see whether the definer has not stated in the definition what it is said relative

175. The idea might be better conveyed the other way around: when the appetite is sated by actual intercourse, love is not simultaneously lessened.
176. Plato, *Hippias Major* 298a.

to, either intrinsically or with respect to its kind—for example, if he has defined scientific knowledge as "supposition incapable of being persuaded to change," or **146ᵇ1**
wish as "desire without pain"; for the substance of everything relative is relative to something else, since the being for each relative is the same thing as it precisely having some relation to something. He should, then, have said that scientific knowledge is supposition about the scientifically knowable, and that wish is desire for the good. It 5
is the same way too if he has defined grammar as "scientific knowledge of letters"; for he should have assigned in the definition either what grammar itself is relative to or what the kind is relative to. Or, again, look to see whether, although the relative has been stated, it is not assigned in relation to its end; and the end in a given case is the best thing or what the other things are for the sake of. The best one, then, must be 10
stated, or the ultimate one—for example, appetite must be defined not as "for what is pleasant," but "for pleasure"; for it is for the sake of pleasure that we also choose what is pleasant.

Look to see too whether what he has assigned the definition in relation to is a coming to be or an activity; for nothing of these sorts is an end; for having finished the activity or having finished the coming to be is more an end than the coming to be and the being active. Alternatively, perhaps this is not true in all cases; for pretty 15
much everyone wishes to be pleased more than to have ceased to be pleased, so that the activity is more of an end than having finished it.

Again, in certain cases, one must look to see whether he has not determined the quality, quantity, place, or other relevant differences of the thing—for example, with 20
an honor-lover, the quality or quantity of honor he desires; for everyone desires honor. So it is not enough to say that an honor-lover is a person who desires honor, but one must add the differences just mentioned. Similarly, with a money-lover too, the quantity of money he desires, or with a person who lacks self-control, the quality 25
of pleasure he is concerned with; for it is not a person controlled by any pleasure whatever who is said to lack self-control, but the one controlled by certain pleasures.[177] Or, again, when people define night as "a shadow over the earth," earthquake as "a movement of the earth," cloud as "a condensation of air," or wind as "movement of air"; for quality, quantity, and due to what must be added. And similarly in other 30
cases of this sort; for when one leaves out any difference whatever, one does not state the essence. And one must always attack what is deficient; for not just any manner of movement of the earth whatever or any quantity of it whatever is an earthquake, nor similarly is any manner of movement whatever of any quantity of air whatever wind. 35

Further, in the case of desires, and in the case of any other things where it is fitting, look to see whether the definer has not added "apparent"—for example, in saying that wish is a desire for good, or appetite a desire for pleasant, instead of for apparent good or apparent pleasant. For often the thing that is good or pleasant escapes the **147ᵃ1**
notice of those who feel desire, so that [what they desire] is not necessarily good or

177. *NE* 1118ᵇ6–8.

pleasant but only apparently so. He should, then, have made the one he assigns in this way. On the other hand, if a person who posits the Forms does assign the addition just mentioned, he must be led to the Forms. For there is no Form of anything that is [merely] apparent, but a Form seems to be said in relation to a Form—for example, appetite-itself for pleasant-itself[178] and wish-itself for good-itself. They will not, then, be for the apparent good nor for the apparent pleasant. For it is absurd for there to be an apparent good-itself or pleasant-itself.

6.9
State and Privation, Relatives, and Opposites

Further, if the definition is of the state [or having], look at what has it, or if of what has it, look at the state, and similarly in all cases of this sort—for example, if the pleasant is precisely the beneficial, the one who is pleased is benefited. Speaking in universal terms, in definitions of this sort, the definer in a way defines more than one thing. For a person who defines scientific knowledge in a way also defines ignorance, and likewise he also defines what has scientific knowledge and what lacks scientific knowledge, and knowing scientifically and being ignorant; for when the first has become clear, in a way the remaining ones also become clear. Look, then, in all cases of this sort, to see whether there is not some discordance, making use of the elements [or topics] based on contraries and co-ordinates.[179]

Further, in the case of relatives, look to see whether the form is assigned relative to what the kind is assigned relative to. For example, if supposition is relative to supposable, see whether this sort of supposition is relative to this sort of supposable, and if the multiple is relative to the fraction, whether this sort of multiple is relative to this sort of fraction; for if it has not been given in this way, it is clear that an error has been made.

See too whether the account of the opposite is the opposite account—for example, whether the opposite of the account of the double is the account of the half; for if the double is what exceeds the equal, half is what is exceeded by the equal. And in like manner in the case of contraries; for the contrary account will be that of a contrary, in accord with one or other of the combinations of the contraries. For example, if beneficial is what is productive of good, harmful is what is productive of bad or destructive of good; for one or other of these is necessarily contrary to what was stated
147b1 initially. If, then, neither of them is the contrary of what was stated initially, it is clear that neither of the accounts assigned later would be the account of the contrary, so that the one assigned initially would not be correctly assigned either.

178. Plato, *Republic* 437e.
179. 2.9.

Since some contraries are said of things as one being a privation of the other (for example, inequality seems to be a privation of equality, for unequal is said of things that are not equal), it is clear that a contrary that is said of things as a privation is necessarily defined through the other one, while the one remaining [to be defined] cannot then be defined through the one said in accord with a privation; for then the result would be that each would be known through the other. Be on the lookout, then, in the case of contraries, for an error of this sort—for example, if someone were to define equality as "the contrary of inequality"; for he is defining through what is said of things in accord with a privation. Further, a person who defines in this way necessarily makes use of the thing itself that is being defined. And this becomes clear if the account is substituted for the name; for saying inequality is no different from saying the privation of equality. Equality, then, will be the contrary of the privation of equality, so that the thing itself would be being used.

If neither of the contraries is said of things in accord with a privation, but the account is assigned in a similar way, for example, good is the contrary of bad, it is clear that bad will then be the contrary of good; for the account of things contrary in this way must be assigned in such a way. And so the result again is that the definer makes use of the thing itself that is being defined; for the good belongs in the account of the bad. And so if good is the contrary of the bad, and bad is no different than the contrary of the good, good will be the contrary of the contrary of good. It is clear, then, that it itself has been used.

Further, look to see whether in assigning what is said in accord with a privation, the definer has not assigned what it is a privation of—for example, of the having of something, of the contrary, or of whatever it is the privation of. Also, whether he has not added what it naturally comes to be in, either unconditionally or what it naturally comes to be in primarily. For example, if having said that ignorance is a privation, he has not said that it is a privation of scientific knowledge, or has not added what it naturally comes to be in, or, though he has added this, has not assigned what it naturally comes to be in primarily—for example, saying not that it is in the rationally calculative part but in human or soul; for if there is any of these things whatever that he has not done, he has made an error. It is the same way too if he has not said that blindness is a privation of sight in the eye; for in correctly assigning the what-it-is one must also assign what it is a privation of and what it is that is deprived. **148ᵃ1**

See too whether he has not defined by a privation what is not said in accord with a privation—for example, in the case of ignorance, this sort of error would seem to be committed by those who say what ignorance is in accord with negation.[180] For what has no scientific knowledge seems not to be ignorant, but more so what is utterly deceived. That is why we do not say that inanimate things or children are ignorant. So ignorance is not said of things in accord with the privation of scientific knowledge.

180. *APo*. 79ᵇ23–24.

6.10
Inflections, Forms, Homonyms, Synonyms, Things Said in Many Ways

Further, look to see whether the inflections of the account fit with the corresponding inflections of the name—for example, if beneficial is what is productive of health, whether beneficially is productively of health, and what has brought a benefit is what has produced health.

Look to see too whether the definition stated fits the Form as well. For in some cases this does not happen—for example, as Plato defines[181] animals, adding "mortal" in their definitions; for the Form (for example, human-itself) is not mortal, so that the account will not fit the Form. Unconditionally, in those cases where capable of affecting something or capable of being affected by something is added, it is necessary for there to be discord when the definition is applied to the Form; for Forms seem to be unaffectable and immovable to those who say there are Forms.[182] Against these people even arguments of this sort are useful.

Further, look to see whether he has assigned one common account to things said [to be what they are] homonymously; for things are synonymous when the account corresponding to their name is one. So the assigned definition will fit none of the things falling under the name, if indeed it fits all of the homonymous things equally. This is what happens in fact to Dionysius'[183] definition of life, if indeed it is "a congenital movement inseparably connected to a kind of beings capable of nourishment"; for this belongs no more to animals than to plants. Life, however, seems not to be said of things in accord with one form, but one form seems to belong to animals and a distinct one to plants.

It is also possible to deliberately choose to assign the definition as a synonym and to speak of all life in accord with one form. But there is also nothing to prevent someone, even if he sees the homonymity and wishes to assign the definition of one of the two homonyms, from unwittingly assigning an account that is not special to it but common to both. Nonetheless, if he has done either of these things, he has committed an error. Since homonyms sometimes go unnoticed, when questioning, treat them as synonyms (for the definition of the one will not fit the other, so that it will not seem to be [correctly] defined this way, since it must fit everything that is synonymous), but, when answering oneself, distinguish them. Since some answerers say, on the one hand, that what is synonymous is homonymous, when the assigned account does not fit all cases, and, on the other hand, that what is homonymous is synonymous, when it fits both cases, one must obtain an agreement beforehand

181. No such definition occurs in Plato's extant writings.
182. Reading τοῖς λέγουσιν ἰδέας εἶναι. See 154a18–20.
183. Probably the little-known Dionysius the Sophist, mentioned at ††*Physiognomics* 808a16.

on these matters or else pre-deduce[184] that the thing is a homonym or a synonym, whichever of the two [is most useful]; for people concede something more readily when they do not foresee what the result will be.

If, however, when there has been no agreement, someone says that what is synonymous is homonymous because the account he has assigned does not also fit this case, look to see whether the account of the case in question fits the remaining cases as well, since then it is clear that it would be synonymous with the remaining ones. Otherwise, there will be several accounts of the remaining cases. For the two accounts that are in accord with the name fit them: both the one assigned earlier and the one assigned later.

Again, if someone, defining something said of things in many ways, and finding that the account does not fit all the cases, were to say not that the thing is homonymous, but that the name does not apply to all of them, because the account does not apply to them either, one must say to such a person that one must use the traditional and constantly attributed names, though in some cases[185] one should not speak in the same way as ordinary people.

6.11
Complexes, Composites, and Substitution of Names

If a definition has been proposed of something complex, subtract the account of one of the components of the complex, and look to see whether the remainder is an account of the remainder; for if it is not, it is clear that neither is the whole an account of the whole. For example, if someone[186] has defined limited straight line as "limit of a plane having limits whose mid-point blocks the view of the limit-points," and if the account of limited line is "limit of a plane having limits," that of straight must be the remainder: whose mid-point blocks the view of the limits. But an unlimited line, though straight, has neither a mid-point nor limit-points, so that the remainder is not the account of the remainder.

Further, when what is being defined is a composite, look to see whether the assigned account is isomerous to what is being defined. An account is said to be isomerous when the component parts in the thing are as many as the nouns and verbs in its account. For it is necessary, in cases of this sort, for the substitution to be name for name, either in the case of some or of all, since no more names are uttered now than before, while a person giving a definition must assign an account in place of the **149^{a}1** names, preferably in place of all, but if not, then of most. For in the former way, in the case of simple things too, a person who had changed the name would have given a definition—for example, substituting "cloak" for "cape."

184. 156^{a}7–8.
185. 110^{a}14–22.
186. Plato, *Parmenides* 137e.

Further, and a greater error, look to see whether he has made a substitution for names that are even less well known—for example, "glistening mortal" for "pale human"; for not only has it not been defined, but it is less perspicuous stated this way.

Look to see too whether in the exchange of names it does not any more signify the same thing—for example, if theoretical scientific knowledge has been said to be theoretical supposition. For supposition and scientific knowledge are not the same; but they should be, if indeed the whole thing is going to be the same. For "theoretical" is common to both accounts, but the remainder is different.

Further, look to see whether in making a substitution of one or other of the names he has made a substitution not of the difference but of the kind, as in the example just stated. For theoretical is less well known than scientific knowledge; for the latter is a kind, the former a difference, and the kind is best known of all. So the substitution should have been made not of the kind but of the difference, since the latter is less well known. (Alternatively, perhaps this objection is ridiculous; for there is nothing to prevent the difference from being stated by the better-known name, not the kind. In which case, it is clear that it is for the name of the kind, not of the difference, that the substitution must be made.[187]) But if he is substituting not a name for a name but an account for a name, it is clear that it is of the difference rather than of the kind that an account should be assigned, since the definition is given for the sake of making the thing known; for the difference is less well known than the kind.

6.12
Errors in Definitions

If the definer has assigned the definition of the difference, look to see whether the assigned definition is common to something else as well. For example, if he has said that odd number is "number that has a middle." For number belongs in common to both accounts, but it is for odd that he has made the substitution. But a line and a body also have a middle, though they are not odd. So this would not be a definition of odd. On the other hand, if things are said to have a middle in many ways, in what way something has a middle must be defined. So that there will be a criticism to make, or a deduction that he has not given a definition.

Again, look to see whether he has assigned a definition of something that is of one of the beings, while what falls under the account is not one of the beings—for example, if he has defined white as "color mixed with fire"; for it is impossible for
149b1 what is bodiless to be mixed with body, so that there could not be color mixed with fire, but there is white.

187. Reading ἢ τοῦτο . . . ποιητέον.

Further, those who, in the case of relatives, do not determine what the thing is said in relation to, but, in stating it, include it among too many things, are either wholly or partly mistaken—for example, if someone said that medicine is the science of being. For if medicine is the science of none of the beings, it is clear he was wholly mistaken, while if it is the science of some, but not of others, partly mistaken; for it must be the science of all beings, if indeed it is said to be such intrinsically, and not coincidentally, as holds of all the other relatives; for everything scientifically knowable is said to be such relative to science. It is the same way too with the others, since all relatives are convertible.[188] Further, if indeed a person assigning not intrinsically, but coincidentally, is correctly producing what he assigns, each relative would be said not in relation to one thing, but in relation to several. For there is nothing to prevent the same thing from being a being, a white thing, and a good thing, so that one would be assigning correctly if one assigned in relation to any of these whatever, if indeed a person assigning coincidentally is assigning correctly. Further, it is impossible for an account of this sort to be special to what it is assigned as the account of; for not only medicine, but the majority of the other sciences as well, are said in relation to being, so that each of these will be a science of being.[189] It is clear, then, that a definition of this sort is not the definition of any science whatever; for the definition must be special and not common.

Sometimes people define not the thing at issue but the thing at issue in its good state or when complete. Of this sort are the definition of the orator and of the thief, if indeed an orator is defined as "a person who gets a theoretical grasp on what is persuasive on a given occasion and leaves nothing out," while a thief is defined as "a person who takes things by stealth"; for it is clear that if each is of that sort, one will be a good orator and the other a good thief. For it is not the one who takes by stealth, but rather the one who wishes to take by stealth, that is the thief.

Again, look to see whether he has assigned what is choiceworthy because of itself either as productive or practical or in some other way choiceworthy because of something else—for example, saying that justice is what is preservative of laws, or that wisdom is what is productive of happiness; for what is productive or preservative is one of the things choiceworthy because of something else. Alternatively, perhaps there is nothing to prevent what is choiceworthy because of itself from also being choiceworthy because of something else, but nonetheless a person who has defined what is choiceworthy because of itself in this way has made an error; for what is best in a given thing is most of all in its substance, and what is choiceworthy because of itself [in that thing] is better than what is choiceworthy [only] because of something else, so that it is the former that the definition should have signified more.

188. 125ᵃ5–13.
189. *APo*. 100ᵃ6–9.

6.13
Compound Definitions

Look to see whether the definer in assigning a definition of something has defined it
150a1 as "these things here," or "what is composed of these," or as "this one plus that one."

For if he defines it as "these things here," the result will be that it belongs to both and neither—for example, if he has defined justice as "temperance and courage"; for if there are people each of whom has one of these, both will be just and neither will, since the two together will have justice, while each individually will not. If what has been said is not yet utterly absurd, because this sort of thing does happen in other cases (for there is nothing to prevent two people together from having a mina, though neither individually has it), well, at any rate, that contraries should belong to these people would seem to be completely absurd. This is what will happen if one of them has temperance and cowardice, the other courage and intemperance; for both together will have justice and injustice; for if justice is temperance and courage, injustice will be cowardice and intemperance. In general too the ways of arguing dialectically that the parts and the whole are not the same are all useful against what we are now discussing; for it seems that a person who defines in this way is saying that the parts are the same as the whole. These arguments are most of all proper to cases where the mode of composition of the parts is immediately clear, as in the case of a house or other things of that sort; for then it is clear that, though the parts exist, there is nothing to prevent the whole from not existing, so that the parts are not the same as the whole.

If, however, he has said not that what is being defined is "these things," but rather "what is composed of them," first look to see whether it is not natural for one thing to come to be from the things mentioned; for some things stand in such relation to each other that no one thing can come to be composed of them—for example, a line and a number. Further, look to see whether what is being defined naturally comes to be in one thing primarily, while the things he has said it is composed of do not come to be in one thing primarily, but each in a distinct thing. For then it is clear that it would not be composed of them; for the things the parts are in, the whole too necessarily belongs in, so that the whole is not in one thing primarily, but in several. If, though, both the parts and the whole are each in some one thing primarily, look to see whether they are not in the same one, but rather the whole in one thing and the parts in another.

Again, look to see whether the parts pass away together with the whole; for the reverse must happen: if the parts pass away, the whole does, but if the whole passes away, it is not necessary for the parts to pass away too.

Or, again, look to see whether the whole is good or bad, but the parts neither, or the reverse, the parts good or bad, but the whole neither; for it is impossible for something either good or bad to be composed of things that are neither, or for one
150b1 composed of bad or good things to be neither. Or, again, look to see whether one

thing has more good in it than the other has bad, yet what is composed of them is not more good than bad—for example, if shamelessness is composed of courage and false belief; for courage is more good than false belief is bad. What is composed of them, then, should have followed along with this more, and be either unconditionally good or more good than bad. Alternatively, perhaps this is not necessarily so, if each of the two things is not intrinsically good or bad; for many of the things that are productive [of something] are not intrinsically good, but only when mixed together, or the reverse, are each individually good, but when mixed together are bad or neither good nor bad. What we are now speaking of is most visible in the case of things conducive to health or to disease; for some drugs are such that each individually is good, but if both are administered mixed together, bad.

Again, look to see whether the whole, when composed of a better and a worse [part], is not worse than the better and better than the worse. Alternatively, perhaps this is not necessarily so either, unless things from which it is composed are not intrinsically good, otherwise there is nothing to prevent the whole from not being good, as in the examples just mentioned.

Further, look to see whether the whole is synonymous with one of its parts; for it must not be, any more than in the case of syllables; for the syllable is not synonymous with any of the letters of which it is composed.

Further, look to see whether the definer has not stated the mode of composition; for to state what the thing is composed of is not by itself sufficient to make it known. For the substance of a given composite is not what it is composed of but in what way it is composed of what it is composed of, as in the case of a house; for these things composed in any way whatever are not a house.

But if he assigns this one plus that one as his definition, the first thing one must say is that this plus that is the same either as these things here or as what is composed of them; for a person who speaks of honey plus water is speaking either of honey and of water or of what is composed of honey and water. So, if he agrees that this plus that is the same as either of the things mentioned, it will be fitting to say the very same things as were said before against each of them.

Further, distinguish in how many ways things are said to be one thing plus another, and look to see whether the thing in question is in no way a this plus that. For example, if "this plus that" is said as [two things] being in the same thing receptive of them (as justice and courage are in soul), or else, as being in the same place or in the same period of time, and if this is in no way true of the things in question, it is clear that the assigned definition would not be a definition of anything, since the thing in question is no way a "this plus that." If, however, of the ways distinguished, it is true that each of the two things belongs in the same period of time, look to see whether **151^{a}1** it is possible that it is not in relation to the same thing that each of them is said to be such. For example, if courage has been defined as "daring plus correct thinking"; for it is possible to have daring to steal and correct thinking about matters of health, but a person who has this plus that in the same period of time is in no way courageous.

Further, look to see too whether both of them are said of things in relation to the same thing (for example, in relation to what is healthy); for there is nothing to prevent someone from having both daring and correct thinking in relation to medical matters. Nonetheless, a person who has "this plus that" in this way is not courageous either. For each of the two must be said of things neither in relation to distinct things nor in relation to the same random thing, but in relation to the end that is the end of courage—for example, in relation to the dangers of war, or of something else, if there is something else that is more its end than this.

Some definitions that are assigned in this way do not at all fall under the division of ways just mentioned—for example, that of anger as pain plus a supposition of being treated with contempt. For that the pain comes about because of a supposition of this sort is what the definition wishes to indicate. But the "coming about because of this" is not the same as "this plus that" in any of the ways just mentioned.

6.14
Recapitulation and Conclusion

Again, if the definer has stated that the whole is a composite of these things here (for example, that animal is a composite of soul and body), first look to see whether he has not stated what sort of composite, as, for example, if flesh or bone is defined as "a composite of fire, earth, and air." For it is not enough to speak of composition, but rather one must in addition determine what sort of composition; for it is not that once these things are composed in any way whatever the flesh comes to be, but composed in this way, flesh does, composed in that way, bone. It seems that neither of the things just mentioned is at all the same as a composite; for, for every composite, there is a contrary dissolution, while of the things that were mentioned nothing is a contrary. Further, if it is equally persuasive that everything that is composed is a composite, or else that none is, and, of the animals, each is composed but is not a composite, neither would any of the other things that are composed be a composite.

Again, if it is equally well natural for a pair of contraries to belong to a certain thing, and if he has defined it through one of the two, it is clear that he has not defined it. Otherwise, the result will be that there are several definitions of the same thing; for in what way is the person who has stated it through this contrary giving more of a definition than the one who has stated it through the other, since both equally well occur naturally in it? The definition of soul, if we define it as "substance receptive of scientific knowledge," is of this sort; for it is also equally well receptive of ignorance.

Also, even if one cannot attack the definition as a whole, because the whole is not known, one must attack some part of it, if it is known and it is evident that it has not been correctly assigned; for if a part is done away with, the whole is also done away with. When, again, definitions are non-perspicuous, having corrected and at

the same time reconfigured them so as to have something to attack, in this way proceed to examine them; for it is necessary for the answerer either to accept the assumption of the questioner or make perspicuous himself what exactly is indicated by the account. Further, just as in assemblies it is customary to introduce a law, and if what is introduced is better, to abrogate its predecessor, one should do the same in the case of definitions, and adduce another definition oneself; for if it is evident that it is better and more indicates what is being defined, it is clear that the definition that was proposed will have been done away with, since there are never several definitions of the same thing.

Against all definitions, not the least important element [or topic] is to take a good guess oneself at defining the thing proposed, or else adopt some correctly stated definition; for it is necessary, by looking at a paradigm, as it were, to see clearly what is missing from the things that the definition must have and what is superfluously proposed in addition, so as to be better equipped with lines of attack.

About definitions, then, let this much be said.

BOOK 7

7.1
Sameness and Distinctness

Whether things are the same or distinct, in the strictest of the ways that are mentioned concerning the same—and it was said[190] that what is numerically one is what is in the strictest sense the same—must be looked at on the basis of their inflections, co-ordinates, and opposites. For if justice is the same as courage, the just person is the same as the courageous one, and justly the same as courageously. And similarly in the case of their opposites; for if these things are the same, their opposites—in accord with whatever ways things are said to be opposites—are as well; for it makes no difference whether one takes this or that opposite, since they are the same. Again, look on the basis of the things that are productive or destructive of the things in question, the comings to be and passings away of them, and, in general, at the things that stand in a similar relation to each of them; for when things are unconditionally the same, their comings to be and passings away are the same, as are the things productive and destructive of them.

Look to see too, when one of the two things is said to be most of all something or other, whether the other of the same two things is said to be most of all something or other in the same respect. For example, Xenocrates[191] demonstrates that the happy life and the excellent one are the same, since of all lives the excellent one and the happy

190. $103^{a}23$–24.
191. Fr. 158 Isnardi.

one are most choiceworthy; for only one thing is most choiceworthy and greatest. It is the same way too in other cases of this sort. But each of the two things said to be greatest or most choiceworthy must be numerically one thing. Otherwise, it will not have been proved that they are the same. For it is not necessary, if the Peloponnesians and the Spartans are the most courageous of the Greeks, that the Peloponnesians are the same as the Spartans, since Peloponnesian is not numerically one thing, nor is Spartan, but rather what is necessary is that the one be encompassed by the other, as the Spartans are by the Peloponnesians. Otherwise, the result will be that each is better than the other, if one is not encompassed by the other. For it is necessary for the Peloponnesians to be better than the Spartans, if indeed one is not encompassed by the other; for they are better than all the rest. But similarly it is necessary for the Spartans also to be better than the Peloponnesians; for they too are better than all the rest. So each is made to be better than the other. It is clear, then, that what is said to be best and greatest must be numerically one thing if it is going to be proved to be the same [as another thing]. That also is why Xenocrates has not demonstrated it; for neither the happy life nor the excellent life is numerically one thing, so that it is not necessary for them to be the same due to the fact that both are most choiceworthy, but only for one to fall under the other.

Again, look to see whether, when one of two things is the same as [a third] something, the other is too; for if they are not the same as the same [third] thing, it is clear that neither are they the same as each other.

Further, look at them on the basis of their coincidents or on the basis of the things of which they are coincidents; for whatever is a coincident of one must be a coincident of the other, and whatever one is a coincident of, the other must also be a coincident of. But if there is any discordance among any of these, it is clear that the things are not the same.

See too whether they are not both in one kind of predication, but rather one indicates a quality, the other a quantity or a relation. Again, see whether the kind of each is not the same, but rather one is good, the other bad, or the one virtue and the other scientific knowledge. Or whether, though the kind is the same, the differences predicated of either of them are not the same ones, but rather that of one is theoretical scientific knowledge, that of the other practical. It is the same in the other cases too.

Further, on the basis of the more, look to see whether one admits of the more, while the other does not; or whether both admit of it, but not at the same time, just as the one who loves more does not have more appetite for sexual intercourse, so that love and appetite for sexual intercourse are not the same thing.

Further, on the basis of addition, look to see whether each added to the same thing does not make the same wholes; or whether subtracting the same thing from each leaves a distinct remainder—for example, if someone has said that double of half and multiple of half are the same thing. For then, if "of half" is subtracted from each, the remainders should indicate the same thing, but they do not. For double and multiple do not indicate the same thing.

And look to see not only whether something impossible follows right away because of the thesis, but also whether it is possible for something impossible to come about from a hypothesis to bring one about, as, for example, happens to those who say that void and full of air are the same thing;[192] for it is clear that, if the air went out, it will not be less of a void but more of one, though it will no longer be full of air. So, on a certain hypothesis, whether false or true (it makes no difference which), one thing is done away with, while the other is not. So they are not the same.

To speak in universal terms, look on the basis of every predicate whatever of each of the two things, and of everything of which they are predicated, to see whether there is any discordance anywhere; for whatever is predicated of the one must be predicated of the other, and whatever the one is predicated of, the other must also be predicated of.

Further, since things are said to be the same in many ways, look to see whether the things in question are also the same in another way; for things that are the same [only] in form or in kind cannot possibly be numerically the same. But what we are looking at is whether it is in the latter way that they are the same or not the same.

Further, look to see whether it is possible for one to be without the other; for then they would not be the same thing.

7.2
Sameness and Definition (1)

The topics related to sameness, then, are this many. And it is clear from what has been said that all the topics capable of disestablishing sameness are also useful against a definition, as was said previously;[193] for if the name and the account do not indicate the same thing, it is clear that the assigned account would not be a definition. On the other hand, none of the topics capable of establishing sameness are useful in **153^{a}1** relation to a definition; for it is not enough to have proved that what falls under the account is the same as what falls under the name in order to have established that it is a definition, but rather the definition must have all the other features we prescribed.[194]

7.3
Sameness and Definition (2)

Always try, then, to do away with a definition in this way and through these things. But if we wish to establish one, the first thing to know is that none or few of those who argue dialectically deduce a definition, but all take something of this sort as a

192. *Ph.* 213^{a}22–^{b}2.
193. 102^{a}11–14.
194. 139^{a}25–35.

starting-point—for example, those people who are concerned with geometry and arithmetic as well as the other such branches of learning. The next thing to know is that it belongs to another study[195] to give an exact account of what a definition is and how one must define things. Now, though, to do so with an eye to present needs is enough, so that it is necessary to say only this much: that it is possible for there to be a deduction of a definition and of the essence of the thing at issue. For if a definition is an account indicating the essence of the thing at issue, and if the predicates in the definition must be the only ones predicated in the what-it-is of the thing at issue, and if the kinds and the differences are predicated in the what-it-is, it is evident that if one assumed that only these are predicated in the what-it-is of the thing at issue, then the account containing these would of necessity be a definition; for it is not possible for anything else to be a definition, since nothing else is predicated in the what-it-is of the thing at issue.

That there is room, then, for a deduction of a definition is evident. On the basis of what things a definition must be established has been determined more exactly elsewhere,[196] but for the proposed methodical inquiry the same topics are useful. For it is necessary to look into the contraries and the other opposites, and to do so looking at the whole accounts and at their parts; for if the opposite account is a definition of the opposite, the stated one is necessarily the definition of the thing proposed. Since opposites combine in several ways, take from among the contraries the one, whichever it is, whose contrary definition is most evident.

Look at the whole accounts, then, in the way just stated, but at their parts as follows. First, see that the assigned kind is correctly assigned. For if the contrary thing is in the contrary kind, and the thing proposed is not in the same kind, it is clear that it would be in the contrary one, since it is necessary for contraries to be in the same kind or in contrary kinds. Also, we think that the differences that are predicated of contrary things are contraries, like those of white and black; for the one is contracting and the other dilating of sight.[197] So, if contrary differences are predicated of the contrary thing, then the assigned ones would be predicated of the thing proposed, so that, since both the kind and the differences have been correctly assigned, it is clear that the one assigned would be the definition. Alternatively, perhaps it is not necessary for contrary differences to be predicated of contrary things unless the contrary things are in the same kind, while for those whose kinds are contraries, there is nothing to prevent the same difference from being said of both—for example, of justice and of injustice; for the one is a virtue and the other a vice of soul, so that "of soul" is said as a difference in both cases, since there is also vice and virtue of body. But this is true, at any rate, that the differences of contraries are either contrary or the same. If, then, the contrary difference is predicated of the contrary thing, but not of the one in question, it is clear that the stated difference would be predicated of it. To speak in universal terms,

195. *APo*. 2.3–13.
196. *APo*. 2.13.
197. 107b29–31.

since a definition is composed of kind and differences, if the definition of the contrary is evident, the definition of the thing proposed will also be evident. For since the contrary is either in the same kind or in the contrary one, and likewise the differences predicated of contraries are either contrary or the same, it is clear that either the same kind would be predicated of the thing proposed precisely as of its contrary too, while its differences are either all contrary or else some are contrary and the remaining ones the same; or, the reverse, the differences are the same and the kinds contrary; or both the kinds and the differences are contrary. For it is not possible for them both to be the same; otherwise, the contraries would have the same definition.

Further, look on the basis of inflections and co-ordinates; for here it is necessary for kinds to follow along with kinds, and definitions with definitions. For example, if forgetfulness is the loss of scientific knowledge, to forget will be to lose scientific knowledge, and to have forgotten will be to have lost scientific knowledge. If, then, any one of these whatever is agreed to, it is necessary for the remaining ones to be agreed to as well. Similarly too, if destruction is dissolution of substance, to be destroyed is to have one's substance dissolved, and destructively is dissolvingly. And if destructive is dissolvative of substance, again destruction is dissolution of substance. And similarly in the case of the others. So, if any of them is accepted, all of the remaining ones are agreed to as well.

Also, look on the basis of things that have similar relations to each other. For if what conduces to health is productive of health, what conduces to a good state will be productive of a good state, and beneficial will be productive of good. For each of the things mentioned has a similar relation to its proper end, so that if the definition of one of them is "productive of the end," this would also be the definition of each of the remaining ones.

Further, look on the basis of the more and the equally in all the ways in which it is possible to establish something by comparing things two by two. For example, if this is more a definition of that than this other is of that other, and the one that is less so is a definition, the one that is more so is as well. Also, if this is equally a definition of that as this other is of that other, and if one or other of the two is a definition of the other, so is the remaining one of the remaining one. But when one definition is compared to two things, or two definitions with one thing, looking at them on the basis of the more is not at all useful; for there cannot be one definition of two things, or two definitions of the same thing.

7.4
The Handiest Topics

Also, the handiest of the topics are those just mentioned and those based on co-ordinates and inflections. That is why indeed one must master these most of all and have them ready to hand; for they are most useful in relation to the most cases. And

of the others, the most common ones are the handiest (for these are the most effective of the remaining ones)—for example, looking at the particular cases and looking at the various forms to see whether the account fits them, since the form is synonymous. This sort of procedure is useful against those who posit Forms, as was stated previously.[198] Further, look to see whether the opponent has used a name metaphorically, or predicated it of itself as if it were something else. Also, look to see whether there is any other of the topics that is common and effective.

7.5
Establishing versus Disestablishing a Definition

That it is more difficult to establish than to disestablish a definition is evident on the basis of the things that will be said next. For in fact to see for oneself and to get from those being questioned the relevant sort of premises is not easy—for example, that of the things in the assigned account, one is kind, the other difference, and that the kind and difference are predicated in the what-it-is. Without these it is impossible for a deduction of a definition to come about. For if some other things are also predicated in the what-it-is of the thing at issue, it is unclear whether the one stated or another one is the definition of it, since a definition is an account signifying the essence.

This is also clear from the following considerations. It is indeed easier to draw one conclusion than many. When doing away with a definition, then, it is enough to argue dialectically against one point; for if we have disestablished any one point whatever, we will have disestablished the definition. When establishing one, on the other hand, it is necessary to infer that all the things in the definition belong in it.

Further, when establishing, one must adduce a universal deduction; for it is necessary for the definition to be predicated of everything of which the name is predicated, and, further, to be convertible with them, if the assigned definition is going to be special. When disestablishing, on the other hand, it is no longer necessary to prove the universal; for it is enough to prove that the account is not true of any one of the things falling under the name. Also, even if it is necessary to disestablish it universally, it is not necessary even then for it to be convertible before disestablishing it; for it is enough when disestablishing universally to prove that the account is predicated of none of the things of which the name is predicated. But it is not necessary to prove contrariwise that the name is predicated of things of which the account is not predicated. Further, even if it belongs to everything that falls under the name, but not to them alone, the definition is done away with.

It is similar too where special affection and kind are concerned; for in both cases it is easier to disestablish than to establish. Where a special affection is concerned, then, this is evident from what has been said; for a special affection is for the most part

198. 148a14–22.

assigned in combination,[199] so that it is possible to disestablish it by doing away with [only] one part, while when establishing it is necessary to deduce all of them. And it is fitting to state pretty much all of the remaining points about definition about a special affection as well; for a person establishing a special affection must prove that it belongs to all of the things that fall under the name, while when disestablishing it is enough to prove that it does not belong to one; and even if it does belong to all, but not only to them, it that way too it is disestablished, as was said in the case of definition.

Where the kind is concerned, [it is clear] that there is necessarily only one way to establish it, to prove that it belongs in every case, while it is disestablished in two ways; for if in fact it has been proved to belong in none and also if it has been proved not to belong in some, what was said initially is done away with. Further, when establishing, it is not enough to prove that it belongs, but rather one must also prove that it belongs as kind. When disestablishing, on the other hand, it is enough to prove that it does not belong either in some or in all cases. And it seems that, just as in other areas it is easier to destroy than to produce, so, in these sorts of cases too, disestablishing is easier than establishing.

In the case of a coincident, the universal is easier to disestablish than to establish; for when establishing, one must prove that it belongs in every case, while when disestablishing, it is enough to prove that it does not belong in one. In the case of the particular, it is the reverse: it is easier to establish than to disestablish; for when establishing, it is enough to prove that it belongs in one case, while when disestablishing, one must prove that it belongs in none. **155ᵃ1**

It is evident too why a definition is the easiest of all to disestablish; for since in it many things are assigned, many things are stated, and the more things it is based on, the faster a deduction comes about; for error is likely to occur more in many things than in few. Further, a definition also admits of being attacked through the others; for if the account is not special, or if what is assigned is not the kind, or if something in the account does not belong, the definition is done away with. Against the others, by contrast, neither the things derived from the definition nor all the rest can be used to mount an attack; for only the ones against a coincident are common to all those mentioned. For each of those mentioned must belong to the thing. But if the kind does not belong as something special, the kind is not yet done away with. Similarly too, it is not necessary for a special affection to belong as a kind, or for a coincident to belong as a kind or a special affection, but rather merely to belong. So it is impossible to attack one lot on the basis of the other, except in the case of definition. It is clear, then, that a definition is easiest of all to do away with but the most difficult to establish; for there one must deduce all these; for one must deduce that the things mentioned belong, that what is assigned is a kind, and that the account is special, and further, beyond this, that the account indicates the essence, and has done this correctly.

199. 132ᵃ10–16.

Among the others, the special affection is most like this; for it is easier to do away with because for the most part it is based on more things, and more difficult to establish, because one must infer more things, and in addition, prove that it belongs to and is counterpredicated of the thing at issue.

A coincident is the easiest of all to establish; for in the case of the others, one must prove not merely that it belongs, but also that it belongs in the requisite way, while in the case of a coincident it is enough to prove that it merely belongs. To disestablish it, on the other hand, is the most difficult, because the fewest things are assigned in it; for it is not additionally signified in the coincident in what way it belongs. So in the other cases there are two ways to do away with them, either by proving that they do not belong or that they do not belong in the requisite way, while in the case of a coincident there is no doing away with it except by proving that it does not belong.

The topics through which we will be well equipped to argue dialectically in relation to each of the problems have now been pretty much adequately enumerated.

155b1

BOOK 8

8.1
How to Ask Dialectical Questions (1)

After this we must speak about arrangement, that is, the way one should ask questions. A person who is going to frame questions must, first, find the topic from which to make his attack; second, frame the questions, and arrange them one by one for himself; it remains, third, to ask these, this time to someone else. Up to the point of finding the topic, then, the philosopher's investigation and the dialectician's are similar, but then arranging these things and framing questions is special to the dialectician; for everything of this sort is in relation to someone else. But the philosopher, who is investigating by himself, does not care whether, though the things through which his deduction proceeds are true and known, the answerer does not grant them (because they are close to what was initially at issue, and he foresees what is going to result), but rather the philosopher is presumably eager for his claims to be as known and as close to what is at issue as possible; for it is from things of this sort that scientific deductions proceed.

The things on the basis of which topics must be taken, then, were stated previously.[200] We must now discuss arrangement and the framing of questions, determining which premises, beyond the necessary ones, must be obtained. The ones said to be necessary are the ones through which a deduction proceeds. The ones to be obtained beyond these are of four sorts. They are either for the sake of an induction to assign the

200. Books 2–7.

universal, to add bulk to the argument, for the concealment of the conclusion, or to make the argument more perspicuous. Beyond these there are no premises one must obtain, but rather it is through them that one must develop [their arrangement] and frame one's question. The ones for concealment are for the sake of competition.[201] But since every business of this sort is in relation to someone else, it is necessary to make use of these too.[202]

One must not propose the necessary premises through which a deduction directly proceeds, but rather one must stand off as far above them as possible. For example, do not expect to obtain that the science of contraries is the same, if that is what one wishes to obtain, but rather that it is of opposites; for if he grants this, it can be deduced that the science of contraries is the same too, since contraries are opposites, while, if he does not, one must obtain it by induction, by proposing premises about particular contraries. For one must obtain the necessary premises either by deduction or by induction, or else some by induction, others by deduction (but if they are extremely evident beforehand, even they themselves may be proposed); for both in standing off and in induction it is less clear what is going to result, and at the same time it is still open to one to propose the useful premises themselves if one cannot obtain them in those ways.

Those beyond the ones mentioned must be obtained for the sake of these [necessary ones], and each must be used in this way: when arguing inductively, [argue] from particular to the universal, and from the known to the unknown (for the known is what is in accord with perception, whether unconditionally or to most people); but, when concealing, pre-deduce the things through which the deduction of what was initially at issue comes about, and obtain as many of these as possible. And this would come about if one deduced not only the necessary premises, but also some of those useful for obtaining them. Further, do not state the conclusions, but instead state them as a body later on; for this way one would stand farthest off from what was posited initially.

To speak in universal terms, a person who is obtaining answers in a concealed way must so ask questions that when the whole argument has been framed as questions and he states his conclusion, the why is looked for [by the answerer]. But this will most of all come about in the way just stated; for if only the ultimate conclusion is stated, it will be unclear how it follows, because the answerer does not foresee what it follows from, if the prior deductions were not fully articulated. And the deduction of the conclusion would be least fully articulated if we propose not the premises of that deduction, but rather those in virtue of which that deduction comes about.

It is also useful not to obtain the claims from which the deductions proceed as a continuous series, but rather alternating the claims related to one conclusion with

201. $159^{a}26$–36, $161^{a}37$–$^{b}1$, *SE* $165^{b}10$–11.
202. *SE* $183^{b}1$–6.

those related to the other; for if the ones proper [to the deduction bearing on the posit] are put next to each other, what results from them will be more easily foreseen.

Also, in those cases that admit of it, one should obtain the universal premise by means of a definition that applies not to the things at issue themselves, but rather to their co-ordinates. For people fallaciously deceive themselves, when the definition of the co-ordinate has been obtained, that they have not conceded the universal—for example, if what one must obtain is that an angry person desires revenge, and it could be obtained that anger is a desire for revenge because of apparent contempt; for it is clear that once this has been obtained we would have the universal we wanted. On the other hand, it often happens to those who propose [one that applies to] the things at issue themselves that the answerer refuses it because he is more ready with an objection to it—for example, that an angry person does not desire revenge; for we get angry with our parents, but do not desire revenge. Presumably, his objection is not sufficient; for in the case of some people, merely paining them or making them regret is a sufficient revenge. Nonetheless, as regards not seeming to be unreasonably refusing what is proposed, he has something persuasive [to say]. But in the case of the definition of anger, it is not equally easy to find an objection.

Further, propose something as if not proposing it because of itself but for the sake of some other proposals; for people are on the lookout for things that are useful against the posit. And, to speak simply, make it as unclear as possible whether one wishes to obtain what one proposes or its opposite; for if it is unclear which one is useful to the argument, people will more readily accept what seems to be so to them.

Further, obtain answers through similarity; for it is both persuasive and better hides the universal. For example, arguing that since the science as well as the ignorance of contraries is the same, so too the perception of contraries is the same; or—the reverse—since the perception is the same, the science is too. This is similar to induction, but certainly not the same; for there one obtains the universal from the particulars, while in the case of similar things what one obtains is not the universal under which all the similar things fall.

Also, one must sometimes bring an objection against oneself; for answerers have a minimally suspicious attitude toward those who seem to be arguing dialectically in a just way. It is also useful to add that such-and-such is customary and a saying; for people hesitate to disturb what is customary if they have no objection to offer, and at the same time, since they make use of such things themselves, they guard against disturbing them.

Further, do not be eager, even if the point is an altogether useful one; for people are more likely to resist those who are eager. Also, proposing something as if in a comparison;[203] for if something is proposed because of something else and not because it is useful because of itself, people more readily accept it. Further, do not propose the thing itself that is to be obtained, but something from which it follows of

203. *Rh.* 1393b3–8.

necessity; for people more readily concede it because it is not equally evident what is going to follow from this, and once the latter has been obtained, the former has also.

Also, wait till almost the last moment to ask for what one most wishes to obtain; for it is the first things that people most refuse, because most questioners state first the things they are most eager about. Against some people, these are the things to propose first; for hagglers most readily concede the first things, if it is not completely evident what will result, but haggle toward the end. It is the same way too with people who think themselves incisive answerers; for after they have accepted most points, toward the end they become extremely subtle on the presumption that things do not follow from what has been proposed. They accept things off-handedly, trusting in their talent and supposing that they will not suffer any loss.

Further, lengthen the argument and throw in things that are of no use to it, like **157ª1** those who draw false diagrams;[204] for when there are many things, it is unclear in which one the falsehood lies. That is also why questioners escape notice by putting forward in a hole-and-corner way things that would not be accepted if proposed by themselves.

For concealment, then, use the things mentioned, while for ornamentation, use induction and the division of things that are akin. What sort of thing induction is clear. Division is this sort of thing—for example, one science is better than another either by being more exact[205] or by being the science of better things;[206] or, of the sciences, some are theoretical, some practical, and some productive. For each of these sorts of things ornaments the argument, though they are things it is not necessary to state to obtain the conclusion.

For perspicuousness adduce paradigms[207] and comparisons, and the paradigms must be relevant and drawn from things known ("as Homer says," not "as Choerilus says"); for in this way what is proposed would be more perspicuous.

8.2
How to Ask Dialectical Questions (2)

In arguing dialectically, use deduction with those skilled in dialectic more than with ordinary people; contrariwise, use induction more with ordinary people. This was also spoken about previously.[208]

In some cases, it is possible when doing an induction to frame the universal as a question. In others, however, this is not easy because a common name has not been established for all the similar cases, but rather, when the universal [premise] must be

204. See *SE* $171^{b}12$–16.
205. *APo*. $87^{a}31$–37.
206. *DA* $402^{a}1$–4, *Met*. $983^{a}4$–$983^{a}11$, *NE* $1141^{b}2$–3.
207. *Rh*. $1356^{b}13$–15.
208. $105^{a}16$–19.

obtained, they say, "it is this way in all cases of this sort." But this is one of the most difficult things, to determine which of the cases proposed are of the relevant sort and which are not. Also, by means of this people often cheat each other in arguments, some saying that things are similar when they are really not, others disputing the similarity of things that are similar. That is why one must try to make a name oneself that will apply to all the things of the relevant sort, so that it will neither be open to the answerer to dispute, saying that what is being introduced is not said of things in a similar way, nor to the questioner to quibble, saying that it is said of things in a similar way, since many that are not said of things in a similar way appear to be said of them in a similar way.

When one does an induction from many cases and someone does not grant the universal [premise], then it is just to demand an objection. But when one has not said oneself in which cases it holds, it is not just to ask in which cases it does not hold; for one must previously have done an induction to demand an objection in this way. Also, one must expect him to bring objections not to the thing proposed alone, unless it is the one and only thing of the relevant sort, as two is the only even number that is prime; for the objector must either bring his objection against another case or say that this is the only case of the relevant sort.

Against objectors to the universal [premise] who bring their objection not against the thing itself but against some homonym of it, for example, that someone could have a color, a foot, or a hand that was not his own (for a painter could have a color and a cook a foot that was not his own)—in cases of this sort, then, one must draw distinctions when framing questions; for if the homonymy remains concealed, the objector will seem to have objected well to the premise.

If, on the other hand, the answerer blocks the question by objecting, not to a homonym, but to the thing itself, subtract the point to which the objection is made, proposing the remainder and making it the universal, until one obtains what is useful. For example, in the case of forgetfulness, that is, of having forgotten; for people do not want to grant that someone who has lost scientific knowledge has forgotten it (because if the thing at issue changes, he has lost scientific knowledge, but has not forgotten). Subtracting, then, what the objection applies to, one must state the remainder—for example, if, when the thing at issue remains as it is, someone loses his scientific knowledge, it is because he has forgotten it. It is the same way too in the case of those who object to the statement that to a greater good a greater bad is opposed; for they propose the fact that to health, which is a lesser good than good condition, a greater bad is opposed; for disease is a greater bad than bad condition. In this case too subtract what the objection applies to; for when it is subtracted, the answerer would more readily accept the remainder, for example, that to a greater good a greater bad is opposed unless one brings the other along with it, as good condition does health.

Do this not only if the answerer has made an objection, but also if, without making an objection, he has refused [the universal premise], because he foresees something of

this sort. For when what his objection applies to is subtracted, he will be compelled to accept it, because he does not foresee in the remainder any case of which it does not hold; and, if he does not accept the premise, when one demands an objection, he will not have any to give. Premises of this sort are those that are false in some cases and true in others; for it is in their case that it is possible to leave a true remainder by subtracting.

But if, when one proposes a premise based on many cases, he brings no objection, he is expected to accept it; for a premise is dialectical if it holds in many cases and there is no objection to it.

When the same thing admits of being deduced both without [reduction to] the impossible and through [reduction to] the impossible, then, although when demonstrating it makes no difference whether it is deduced in one way or the other, when arguing dialectically with someone else, one should not use the deduction through the impossible. For against someone who has deduced without the impossible, it is not possible to dispute. On the other hand, when he has deduced the impossible thing, unless it is extremely evident that it is false, people say that it is not impossible, so that questioners do not get what they wish. **158^{a}1**

One must also propose whatever premises hold in many cases and to which either there is no objection at all or none that is visible on the surface; for if people cannot see cases in which something does not hold, they accept it as true.

But one should not make the conclusion into a question. Otherwise, if the answerer shakes his head in refusal, it seems that no deduction will come about. For often, even when one does not ask the conclusion, but puts it forward as what follows, people refuse it, and by doing this they will seem not to be refuted to those who are not able to see that it follows from what has been accepted. When, then, one asks it without even saying that it follows and the answerer refuses it, it seems as if no deduction has come about at all.

It does not seem, however, that every universal question is a dialectical premise—for example, What is a human being? or, In how many ways are things said to be good? For a dialectical premise is one to which it is possible to answer yes or no. But to the ones just mentioned it is not possible. That is why questions of this sort are not dialectical, unless one assigns the definition oneself or goes through the ways it is said in stating them—for example, Is it not the case that things are said to be good either in this way or that? For to things of this sort it is easy to answer either by affirming or denying. That is why one must try to propose premises of this sort in this way. At the same time, it is also presumably just to inquire from the answerer in how many ways things are said to be good, when, though one has oneself determined them and proposed them, he concedes none of them.

Someone who spends a long time asking questions on a single line of argument is getting answers in a bad way. For if the one being questioned is answering, this is clear, because he is asking many questions or the same ones repeatedly, so that he is either babbling or has no deduction (for every deduction is composed of few things);

on the other hand, if he is not answering, it is again clear, because he does not criticize him or cut off discussion.

8.3
Hypotheses Difficult to Attack

The hypotheses it is difficult to attack and those easy to maintain are the same. And the things that are first by nature and the ones last are of this sort. For the first ones require definition, while the last ones are inferred by means of many steps by anyone wishing to take a continuous series from the first ones (otherwise the attacks appear sophistical); for it is impossible to demonstrate anything without starting from the proper starting-points and making connections as far as the last ones. Answerers neither think it requisite for things to be defined nor, if the questioner does define them, do they take heed. Yet if it has not been made evident what exactly the thing proposed is, it is not easy to attack it. But this sort of thing happens most of all
158b1 concerning the starting-points; for other things are proved through them, but they do not admit of being proved through other things; rather, it is necessary to know each thing of this sort by means of a definition.

Also difficult to attack are things that lie extremely close to the starting-point; for it is not possible to equip oneself with many arguments against these, since there are few intermediate steps between it and the starting-point, through which it is necessary for what comes after these to be proved.

Among definitions, however, the most difficult of all to attack are those in which names have been used of such a sort that it is, first, unclear whether they are said of things simply or in many ways, and, second, it is not known whether they have been used by the definer in their literal sense or metaphorically. For because they lack perspicuousness, they do not have points of attack; and because one is ignorant as to whether it is because of their being said of things metaphorically that they are like this, they do not have a point of criticism.

In general, any problem, when difficult to attack, must be supposed either to require definition, to contain things said in many ways or metaphorically, or to be not far from the starting-points, or because it is not evident to us in the first place in which of ways just mentioned our puzzlement is produced; for when the mode is evident, it is clear that we must either define, distinguish, or be equipped with the intermediate premises; for it is through these that the last ones are proved.

And with many posits, if the definition is not correctly assigned, it is not easier to argue dialectically and attack them—for example, whether one thing has one contrary or several. But when contraries have been defined in the appropriate way, it is easy to infer whether it is possible for there to be several contraries of the same thing or not. And it is the same way in the other cases too.

It seems that in mathematics too it is not easy for a diagram to be drawn in proof of some things because of omission of a definition—for example, that the line cutting the plane parallel to a side divides both the line and the area similarly. When the definition is stated, what is said is evident at once; for the areas and the lines have the same reciprocal subtraction,[209] and this is the definition of same ratio. The first elements are easily proved when the definitions (for example, what a line is and what a circle is) are accepted, except that the arguments that can be used to attack each of these are not many, because there are not many intermediates. But if the definitions of the starting-points are not accepted, this is difficult to do, perhaps wholly impossible. Similar things hold in the case of [dialectical] arguments.

We should not overlook, then, when a posit is difficult to attack, that it is because it has one of the affections just mentioned. But when it takes greater work to argue dialectically for the claim (that is, the premise) than for the posit, one might be puzzled as to whether such things must be accepted or not. For if he will not accept it, but will expect one to argue dialectically for it as well, he will be prescribing something greater in place of what was initially at issue, while if he will accept it, one will be persuading on the basis of what is less persuasive. If, then, the problem must not be made more difficult, he must accept it, while if the deduction must proceed through better-known things, he must not accept it. Or else: by someone who is learning, it must not be accepted if it is not better known, while by someone who is training, it must be accepted only if it appears true. So it is evident that one must not expect to grant acceptance to a questioner and to a teacher in the same way.

8.4
How to Answer Dialectical Questions (1)

As for how one must frame questions and arrange them, what has been said is pretty much enough.

Where answering is concerned, one must first determine what the work of a good answerer, as of a good questioner, consists in. It belongs to a questioner to lead the argument in such a way as to make the answerer state the least acceptable of the beliefs that are necessary because of the posit, while it belongs to an answerer to make it appear that it is not because of him that anything impossible or unacceptable appears to result, but because of the posit; for agreeing at first to what one must not agree to is a distinct error from not defending properly what has been agreed to.

209. If A is a larger magnitude than B, repeatedly subtract B from A until the remainder R_1 is less than B. Subtract R_1 from B until a remainder R_2 less than R_1 is reached. Continue in the same way. Stop if and when a fit is reached. If C is a larger magnitude than D, the pair <A, B> has the same reciprocal subtraction as the pair <C, D>, if the number of such subtractions is the same for each. If the procedure does not terminate, the magnitudes are incommensurable. Aristotle applies the procedure to parallelograms and their sides.

8.5
How to Answer Dialectical Questions (2)

But these things are indeterminate for those who produce arguments for the sake of training and examination. For the aims of teachers and learners are not the same as those of competitors, nor those of the latter as those who spend time together for the sake of investigation; for a learner must always accept the things that seem true; for no one tries to teach a falsehood. Among competitors, a questioner must at all events appear to be producing some effect, while the answerer must appear not to be affected at all. In the case of dialectical meetings, by contrast, for those who produce arguments for the sake, not of competition, but of examining and investigating, it has never been fully articulated what the answerer must aim at, or what sorts of things he must grant and what sorts he must not grant to correctly defend the posit. Since, then, nothing has been handed down by others, we must try to say something ourselves.

It is necessary for the answerer to take up the argument by accepting a posit that is either acceptable, unacceptable, or neither, and one that is acceptable or unacceptable either unconditionally or in a definite way—for example, to a certain person, whether himself or someone else. It makes no difference, however, in whichever way the posit is acceptable or unacceptable; for the way of answering well, of conceding or not conceding what is asked, will be the same.

If the posit is unacceptable, the conclusion that results must necessarily be acceptable, and if it is acceptable, unacceptable; for the questioner always tries to conclude the opposite of the posit. And if what is proposed is neither unacceptable nor acceptable, the conclusion will also be of this sort. And since a person who deduces correctly demonstrates the problem[210] from more acceptable and better-known things, it is evident that if what is proposed is unconditionally unacceptable, the answerer must grant neither what does not seem unconditionally to be the case nor what seems to be the case but less so than the conclusion. For if the posit is unacceptable, the conclusion is acceptable, so that all the things obtained must be acceptable, and more acceptable than the thing proposed, if it is through things that are better known that less well-known ones are going to be inferred. So, if one of the things asked is not of this sort, the answerer should not accept it.

If the posit is unconditionally acceptable, it is clear that the conclusion is unconditionally unacceptable. The answerer must accept, then, both all the things that seem so and whatever things do not seem to be so, but are less acceptable than the conclusion; for then it would appear to be argued dialectically in a sufficient way.

It is the same way if the posit is neither acceptable nor unacceptable; for in this case too, the answerer must grant both everything that appears so, and whatever

210. 104b1–17.

things do not seem to be so, but are more acceptable than the conclusion; for in this way the resulting arguments will be more acceptable.

If, on the other hand, what is proposed is unconditionally acceptable or unacceptable, it is with respect to things that seem so unconditionally that he must make the comparison.[211] But if what is proposed is acceptable or unacceptable, not unconditionally, but to the answerer, it is with respect to what seems to be so to himself or does not seem to be so that he should judge what to accept or not accept.

If the answerer is defending someone else's belief, it is clear that he must accept or refuse each thing by looking to that other person's thought. That is why those who introduce the beliefs of others—for example, that the same thing is good and bad, "as Heraclitus says"—do not grant that contraries cannot belong to the same thing at the same time, not because of believing this themselves, but because according to Heraclitus this is what one must say.[212] This is also what those people do who take over posits from each other; for they aim at saying what those who posited it would say.

8.6
How to Answer Dialectical Questions (3)

It is evident, then, what the answerer must aim at, whether what is proposed is acceptable unconditionally or to a certain person. But since everything asked must be either acceptable or unacceptable or neither, and what is asked must be either relevant to the argument or not relevant to the argument, if it seems to be so, and is not relevant to the argument, having said that it seems to be so, he must grant it, while if it does not seem to be so, and is not relevant to the argument, he must accept **160ª1** it, but indicating in addition that it does not seem to be so, as a precaution against [a charge of] simplemindedness.

If it is relevant to the argument, and seems to be so, he must say that, though it seems to be so, it is too close to what was initially at issue, and that what is proposed is done away with if this is accepted.

If the claim is relevant to the argument but too unacceptable, he should say that, though the conclusion results if it is accepted, what is proposed is too simpleminded.

If it is neither unacceptable nor acceptable, if it has no relevance to the argument, he must grant it without drawing distinctions, while if it is relevant to the argument, he must indicate in addition that what was posited initially is done away with by it. For in this way the answerer will appear not to be affected at all because of what he himself does, if he accepts each thing with foresight, and the questioner will bring to pass his deduction, since everything more acceptable than the conclusion is granted to him.

211. I.e., between the relative costs and benefits, measured in terms of things believed unconditionally, of accepting or refusing a premise.
212. *Met.* $1005^{b}23$–26.

Those, on the other hand, who try to deduce from things more unacceptable than
15 the conclusion, clearly do not deduce correctly, which is why one should not accept what is posited [and grant it] to the questioners.

8.7
Answering Questions That Lack Perspicuousness or Are Said in Many Ways

One must also reply in the same way to questions that lack perspicuousness or that are said in many ways. For since it is granted to the answerer who does not understand to say, "I do not understand," and, if the question is said in many ways, not to have of
20 necessity to agree or decline, it is clear, first, that if what is said is not perspicuous, he must not hesitate to say that he does not comprehend it; for in many cases, as a result of conceding what is not asked perspicuously, he would confront something difficult. But if what is said is something known, and, though it is said in many ways, is true or
25 false in all of them, he should accept or refuse it unconditionally. On the other hand, if it is false in one case and true in another, he should indicate in addition that it is said in many ways, and that it is false in the one and true in the other; for if he draws this distinction later on, it will be unclear whether he also saw the ambiguity initially. But if he did not see the ambiguity earlier, but accepted looking at one of the two
30 ways it is said, he must say to a questioner leading him to the other one, "I did not grant it looking to that one but to the other of them"; for if there are several things falling under the same name or account, disputation easily arises. But if what is asked is perspicuous and simple,[213] he must answer either "yes" or "no."

8.8
Answering Particular versus Universal Questions; Haggling

35 Since every deductive premise is among those the deduction is composed of or else is for the sake of one of them (and it is clear when someone is obtaining it for the sake of another one, because of his asking for several similar things; for it is either through induction or through similarity[214] that people for the most part obtain the universal), the answerer must accept all the particular cases, insofar as they are true
160b1 and acceptable, but should try to bring an objection against the universal; for to prevent the argument without a real or seeming objection is haggling. If, then, he does not grant the universal when it appears so in many cases, though not having an objection, it is evident that he is haggling. Further, if he has not even got it in him

213. I.e., the contrary of being said in many ways.
214. 156b14–17.

to counterargue that it is not true, he would seem all the more to be haggling. (And yet even this is not enough; for we have at our disposal many arguments against [acceptable] beliefs that are difficult to resolve—for example, Zeno's argument[215] that it is not possible to move or to traverse the stadium, but one must not, because of this, refuse to accept their opposites.) If, then, though neither having an objection nor being able to counterargue, he does not accept, it is clear that he is haggling; for haggling in arguments is answering in a way beyond the ways just mentioned, that is, in a way destructive of deduction.

8.9
Practicing on Oneself; Unacceptable Hypotheses

To uphold a posit or a definition, one must try developing counterarguments to it by oneself ahead of time; for it is clear that the things one must oppose are the ones on the basis of which those obtaining answers do away with what was proposed.

One must beware of upholding an unacceptable hypothesis. And there are two ways it could be unacceptable; for it could be so by being one from which saying absurd things follows (for example, if someone were to say that everything or nothing is in movement) or by being what someone with a worse character would choose, or what is contrary to our wishes (for example, that pleasure is the good, or that doing injustice is better than suffering injustice); for on the supposition that these are not things one says merely for the sake of argument but the things that seem so to you, people hate you.

8.10
Resolving Arguments That Deduce a Falsehood

As for arguments that deduce a falsehood, resolve them by doing away with the thing through which the falsehood comes about; for it is not the person who does away with any thing whatever that resolves it, not even if what is done away with is false. For the argument might contain several falsehoods—for example, if someone obtained that the person seated is writing, and that Socrates is seated; for it follows from these that Socrates is writing. When "Socrates is seated" is done away with, the argument is no closer to being resolved, and yet the claim is false. But it is not by depending on it that the argument is false; for if someone happened to be seated but not writing, the same resolution will no longer fit such a case. So it is not this that must be done away with, but rather that the person seated is writing; for not every seated person is writing. The person, then, who does away with what the falsehood

215. *Ph.* 233ᵃ21–31, 6.9.

depends on has entirely resolved the argument, and it is the person who knows that the argument depends on it who knows the resolution (as in the case of drawing false diagrams[216]). For it is not enough to object, not even if what is done away with is false, but one must also demonstrate why it is false; for this way it would be evident whether or not he makes his objection with foresight.

161ᵃ1 There are four ways to prevent an argument from reaching a conclusion: by doing away with what the falsehood depends on; by stating an objection to the questioner (for often he has not resolved anything, yet the one obtaining answers is not able to lead him any further); third, objecting to the questions asked (for it may happen that what the questioner wishes does not come about on the basis of the questions asked, because they have been framed incorrectly, though when something is added the conclusion does come about). If, then, the questioner cannot advance any further, the objection would be against the questioner, while, if he can, against his questions. The fourth and worst sort of objection is the one relating to the time (for some people raise an objection of this sort, that it would take longer to dialectically argue against than the present discussion allows).

Objections, then, as we said, come about in four ways. But only the first of those mentioned is a resolution, while the remaining ones are sorts of preventions and impediments to conclusions.

8.11
Criticism of Arguments as Such versus When Framed as Questions

Criticism of an argument intrinsically as an argument is not the same as criticism of it when it is framed as questions. For often the person questioned is responsible for the argument having not been dialectically argued correctly, because he does not concede the things from which it was possible to dialectically argue correctly against the thesis; for it is not up to one of two partners alone to ensure that their common work is correctly accomplished. Sometimes, then, it is necessary to attack the speaker not his posit: when the answerer is on the lookout for things that go contrary to the questioner and is abusive besides. By haggling, at all events, people make their discussions competitive not dialectical.

Further, since arguments of this sort are for the sake of training and examining, not of teaching, it is clear that not only true but also false conclusions must be deduced, and not always through truths but sometimes also through falsehoods; for often, when a truth has been posited, it is necessary for the dialectician to do away with it, so that he must use falsehoods as a premise. And sometimes, even when a falsehood has been posited, he must do away with it through falsehoods; for there is nothing to prevent things that are not so from seeming to be more so to someone

216. *SE* 171ᵇ12–16.

than things that are true, so that if the argument comes about from things that seem to be so to him, he will be more persuaded than benefited.

Anyone who is going to change the course of an argument correctly, however, must change it in a dialectical way, not in a contentious way, just as the geometer must do so in a geometrical way, regardless of whether the conclusion is false or true. (What sort of deductions are dialectical was stated previously.[217])

Since it is a bad partner who impedes the common work, it is clear that it is so in argument as well. For there is also something common proposed[218] in arguments, except in the case of competitive ones. In these it is not possible for both to achieve the same end; for there cannot be more than one winner. It makes no difference whether one does this by answering or by questioning; for the person who questions in a contentious way argues dialectically in a bad way, and so does the answerer who will neither grant what is evident nor admit to understanding what the questioner can possibly wish to obtain with his question.

It is clear, then, from what has been said that an argument intrinsically as such must not be criticized in the same way as a questioner; for there is nothing to prevent the argument's being bad, though the questioner has argued dialectically as well as possible with the answerer. For, against hagglers, one is perhaps simply not able to produce such deductions as one wishes, but only such as one can.

Since it is indefinite when human beings assume contrary things and when they assume what was initially at issue (for often when talking to themselves they say contrary things, and, having refused something earlier, grant it later on—which is why, when they are asked for contraries and when they are asked for what was initially at issue, they often grant these), bad arguments necessarily come about. The one responsible [in these cases] is the answerer who at certain moments does not grant some things but at other moments grants others of the same sort.

It is evident, then, that questioners and arguments must not be criticized in the same way.

Of an argument as intrinsically such, there are five criticisms. First, from the premises asked, neither what was proposed nor anything else at all is concluded, since all or most of the premises in which the conclusion lies are either false or unacceptable, and the conclusion does not come about either when some premises are subtracted or when some are added or when some are subtracted and others added. Second, if it is not against the posit that a deduction comes about (from the sorts of premises and in the way mentioned just previously). Third, if a deduction comes about with certain premises added, but these are worse than the ones asked for and less acceptable than the conclusion. Again, if it comes about with certain premises subtracted; for sometimes more premises are assumed than are necessary, so that it is not through them that the deduction comes about. Further, if it is from premises

217. 100^{a}29–^{b}23, 159^{a}25–34.

218. Reading τὸ προκείμενόν ἐστι.

more unacceptable and less persuasive than the conclusion; or if it is from premises that are true but require more work to demonstrate than the problem does.

One must not require the deductions of all problems to be equally acceptable and persuasive; for simply by nature some objects of inquiry are easier and others more difficult, so that if one has inferred from the most acceptable premises possible, one has argued dialectically in the correct way. It is evident, then, that the same criticism also does not apply to an argument in relation to the problem at issue and an argument intrinsically as such; for there is nothing to prevent an argument from being intrinsically blameworthy but praiseworthy in relation to a problem; or again, **162^a1** conversely, intrinsically praiseworthy but blameworthy in relation to the problem: when there are many premises both acceptable and true from which it is easily concluded. It is possible too that an argument that reaches a conclusion may sometimes be worse than one that does not reach a conclusion: when the first is concluded from simpleminded premises (the problem not being of that sort), while the second needs additional premises, but of the sort that are acceptable and true, and it is not in the additional ones [by themselves] that the argument lies. As regards those that reach a conclusion through falsehoods, it is not just to criticize them; for a falsehood must always be deduced through falsehoods, while it is sometimes possible for a truth to be deduced even through falsehoods. This is evident from the *Analytics*.[219]

When the argument stated is a demonstration of something, if there is something else that is not related in any way to the conclusion, it will not be a deduction of that. And if it were [made] to appear to be one, it would be a sophism, not a demonstration. {A *philosophêma* is a demonstrative deduction; an *epicheirêma* is a dialectical deduction; a sophism is a contentious deduction; and an *aporêma* is a dialectical deduction of a contradiction.}[220]

If something is proved from premises both of which seem so, but do not seem equally so, there is nothing to prevent what is proved from seeming more so than each singly. But if one premise were to seem so and the other to seem neither so nor not so, or if one were to seem so and the other not so, then if these are equal, [the conclusion] would be equally so or not so, but if one of the two is more, it will follow along with the one that is more so.

There is also the following error regarding deductions: when someone proves something through a longer series of steps, though it could be proved through fewer ones that actually belong in the argument. For example, if to prove that one belief is more [a belief] than another, someone were to assume the following: a thing-itself is most of all [that thing], there is a truly believable-itself, and so it will be more [that thing] than the particular ones; but what is said in relation to the more is more [that

219. *APr*. 2.2, *APo*. 78^a6–13.

220. Probably inauthentic. Elsewhere a *philosophêma* seems to be a work of philosophy (*Cael*. 279^a31–32) or a puzzle that has become a standard philosophical one (294^a19–20), while an *aporêma* seems to be simply a puzzle (*APr*. 71^a29, *APo*. 92^a29, *Ph*. 211^a10–11, *GC* 327^b32, *Met*. 1004^a34, 1011^a6, 1077^a1).

thing]; but again there is a true believable-itself, which will be more exactly [that thing] than the particular ones. He assumed the existence of a true believable-itself and that each thing-itself is most of all [that thing], so [as to prove] that this true belief is more exactly [a belief than another]. What, though, is the fault? Or is it that what the argument depends on makes hidden the cause?

8.12
Clear and False Arguments

An argument is clear in one way, which is also the most commonly used one, if it reaches a conclusion in such a way that no further questions are needed; in another way, which is also the one most of all said to be such, when the premises obtained are the ones it is necessary for the conclusion to be deduced from, and it is concluded through conclusions; in a further way, if anything[221] missing is extremely acceptable. **$162^{b}1$**

An argument is called "false" in four ways: one way is when it appears to reach a conclusion but does not reach a conclusion (this is called a "contentious deduction").[222] Another is when it reaches a conclusion, but not in relation to the thing proposed (which is just what happens most in those leading to impossibility). Or it reaches a conclusion in relation to what is proposed, but not in accord with the methodical inquiry proper to it. And this is when it appears to be medical but is not medical, or geometrical but is not geometrical, or dialectical but is not dialectical, whether what results is true or false. Another way is if it reaches a conclusion through falsehoods. And its conclusion, though it will sometimes be false, will sometimes be true; for a falsehood is always inferred through falsehoods, but it is possible for a truth to be inferred even though not from truths, as was also stated previously.[223]

An argument's being false is an error of the arguer rather than of the argument (and it is not even always of the arguer, but only when he is not aware of it), since, as intrinsically such, we approve of it more than of many true ones, if from what seems most of all to be so it does away with some truth. For an argument of this sort is a demonstration of other truths; for one of the things proposed must not be absolutely true, so that it will be a demonstration of this. But if a true conclusion were to be reached through false and very simpleminded premises, it would be worse than many that deduce a falsehood, and it might be of this sort even if reaching a false conclusion.

So it is clear that the first step in investigating an argument as intrinsically such is to see whether it reaches a conclusion, second, whether this is true or false, third, from what sorts of premises. For if it is from false but acceptable premises, it is a logico-linguistic argument; if from true but unacceptable ones, it is a bad one; if

221. Reading τι.
222. $100^{b}23–25$.
223. $162^{a}9–11$.

from false and extremely unacceptable ones, it is clear that it is a bad one, either unconditionally or in relation to the thing at issue.

8.13
Asking for What Was Initially at Issue; Asking for Contraries

How a questioner asks for what was initially at issue and for contraries has been stated in accord with truth in the *Analytics*,[224] and must now be stated in accord with belief.

People appear to ask for what was initially at issue in five ways. The most evident and the first is if someone asks for the very thing that needs to be proved. In the case of the very thing, this is not easy to conceal, but in the case of synonyms and in those cases in which a name and an account signify the same thing, it is easier. The second is when someone needing to demonstrate a particular asks for a universal—for example, trying to demonstrate that the science of contraries is one, he expects to obtain that that the science of opposites in general is one; for he seems to be asking for what he needed to prove by itself, together with several other things. Third, if when it is proposed that a universal be proved, someone were to ask for a particular—for example, when it is proposed that the science of all contraries is one be proved, he expects to obtain this about these particular contraries; for this person too seems to be asking for what, together with other things, he needed to prove separately by itself. Again, if someone, dividing it up, asks for the problem—for example, if someone, needing to prove that medicine is the science of healthy and diseased, were to expect to obtain each of these separately. Or if someone were to expect to obtain one or other of the things that of necessity follow along with each other—for example, that the side is incommensurable with the diagonal, when he must demonstrate that the diagonal is incommensurable with the side.

People ask for contraries in the same number of ways as they do for the starting thing. For the first is if someone were to ask for an opposed assertion and denial; second, for contraries by an antithesis—for example, [asking whether] the same thing is good and bad. The third is if someone who expected to obtain the universal were to ask for its contradictory in the case of particulars (for example, if having obtained that the science of contraries is one, he were to expect to obtain that there is a science of healthy and a different science of diseased). Or if, having asked for the latter, he were to try to obtain the contradictory in the case of the universal. Again, if someone were to ask for the contrary of what results of necessity through the things proposed, and even if he were not to [try to] obtain the [pair of] contraries themselves, he were to ask for a pair such that from them there will be the opposing contradiction.

Obtaining contraries differs from obtaining the starting thing, however, because the error in the second is in relation to the conclusion (for that is what we look to

224. *APr.* 2.15–16.

when we say that someone asks for the starting thing), while in the case of contraries it lies in the premises standing in a certain relation to each other.

8.14
Training and Practice in Dialectical Arguments

For training and practice in arguments of this sort, first, it is necessary to get into the habit of converting arguments; for this way we will be better equipped in relation to what is said, and also we will know by heart many arguments in knowing by heart a few. For converting is doing away with one of the premises granted by taking the reverse of the conclusion together with the remaining premises asked for; for it is necessary, if the conclusion is not so, for some one of the premises to be done away with, if indeed it was necessary, all of them being posited, for the conclusion to be so.

Also, in relation to every posit look both for a dialectical argument that it is so and for one that it is not so, and, when it has been found, look immediately for its resolution; for in this way the result will be that we will at the same time get training both in asking and in answering, and even if we have no one else to argue with, we can argue with ourselves. **163^b1**

Also, select the dialectical arguments concerned with the same posit and set them alongside each other; for it makes one abundantly well equipped against being forced [to a conclusion], and also has much help to offer in relation to refuting, when one is well equipped to argue both that it is so and that it is not so (for the result is that one is put on one's guard against contrary arguments).

Also, in relation to knowledge and philosophical wisdom, being able to get a comprehensive view, or to have gotten a comprehensive view, of the consequences of either hypothesis is no small instrument; for it remains [only] to choose one or the other of them correctly. In relation to this sort of thing, one must be naturally well-disposed. And this is what it is to be naturally well-disposed as regards truth: to be able to correctly choose the true and avoid the false. And this is just what the naturally well-endowed are able to do; for it is by loving and hating in the correct way what is put before them that they judge well what is best.

In relation to the problems that most often fall to one, one must learn arguments by heart, especially about the first posits;[225] for in the case of these, answerers often give up in despair. Further, one must be well equipped with definitions and have both acceptable beliefs and primary [starting-points] ready to hand; for it is through these that deductions come about.

One must also try to get possession of the [headings] into the province of which other arguments most often fall. For just as in geometry it furthers the work to be

225. I.e., the ones that are especially difficult to argue for or against, because they are or seem to be starting-points ($163^b27–28$).

trained in the elements, and in arithmetic to have the multiplication table up to ten at one's fingertips (it makes a great difference to knowing the multiples of the other numbers too), so likewise in arguments does having things at hand about starting-points, and knowing the premises by heart. For just as in mnemonics,[226] the mere mention of their places (*topoi*) immediately makes the things themselves be remembered, so these [headings] will make one more capable at deducing, because one sees these items defined and numbered. And it is a common premise, rather than an argument, that should be committed to memory; for to be well equipped with a starting-point—that is, a hypothesis—is [only] moderately difficult.

Further, get into the habit of making one argument into many,[227] thus concealing [the conclusion] in the greatest possible unclarity. And it would be of this sort if one stands off as far as possible from things akin to those the argument is about. Among arguments, it will be the most universal ones to which this can be done—for example, that there is not one science of several things; for this way it applies to relatives, contraries, and co-ordinates.

The mnemonics of arguments should be made universal, even if the dialectical argument has to do with a particular case; for in this way too it will be possible to make one argument into many. (It is the same way too in rhetoric in the case of enthymemes.[228]) For oneself [as answerer] one must avoid as much as possible leading deductions toward the universal. And one must always look at arguments to see whether they argue dialectically on the basis of large number of cases; for all the ones that are particular also do so universally, and the demonstration of the universal is present in the particular one, because it is not possible to deduce anything without universals.

Training in inductions must be assigned to a young person; training in deductions to an experienced one. And try to get premises from those skilled at deduction; comparisons from those skilled at induction; for it is in this that each has been trained. In general, try to take away from training in dialectic either a deduction about something, a resolution, an objection, or whether someone asked something correctly or incorrectly (whether oneself or someone else), and why it was so in either case. For it is on these that the capacity is based, and training is for the sake of capacity—especially where premises and objections are concerned; for, simply speaking, the person skilled at dialectic is the one skilled at proposing premises and skilled at proposing objections. And proposing premises is making many things into one (for what the argument aims at must, in general, be taken as one thing), while objecting is making one thing into many (for one either divides or does away with, grants or does not grant, the things that are proposed).

226. Some mnemonic devices associated the things to be remembered with places in (e.g.,) a familiar room, so that by recalling the room, one recalled the things. The *topoi* from which the *Topics* takes its name, have a similar function in relation to dialectical arguments.
227. 157ᵃ1–5.
228. *Rh*. 1356ᵃ35–ᵇ10.

One should not argue dialectically with everyone or train with a random person. For with certain people arguments necessarily become bad; for with someone who tries in every way to appear to escape, it is just to try in every way to produce a deduction, but it is not gracious. That is why one should not readily engage with random people. For the necessary result is a worthless argument; for even trained people are incapable of refraining from arguing dialectically in a contentious way.

One must also have ready-made arguments related to the sorts of problems in which, though we are well equipped with very few, those we have will be useful in relation to the greatest number. These are the universal ones and the ones it is very difficult on the basis of things at hand to be well equipped[229] against.

229. Reading εὐπορίζεσθαι.

SOPHISTICAL REFUTATIONS*

Sophistici Elenchi

1
Apparent Deductions and Apparent Refutations

Let us now discuss sophistical refutations, that is, arguments that appear to be refutations, but are really fallacies, not [genuine] refutations, beginning in accord with nature from what comes first. 164ª20

That certain arguments are deductions, while others seem to be but are not, is evident. For just as in other cases this comes about because of a certain similarity, so it is likewise too in the case of arguments. For some people too are in good condition, while others [only] appear to be so, like tribesmen choristers puffing themselves up and bulking up, and some people are beautiful because of their beauty, while other appear so, by using cosmetics. And in the case of inanimate things it is likewise; for some of these are truly silver and other gold, while others are not, though they appear to be so to perception—for example, things made of litharge[1] or of lead appear to be silver, and yellow-colored ones appear to be gold. In the same way, one argument is a deduction or a refutation, while another is not, though it appears such due to lack of experience; for those who lack experience look at things from far away. 25 164ᵇ20 25

For a deduction is when certain things are posited, so that, on the basis of them, it is necessary to assert a thing distinct from the ones proposed,[2] while a refutation is a deduction together with the contradiction of the conclusion. Some of them, however, do not produce this effect, though—due to several causes—they seem to. Among these, one topic, which is most naturally well suited for this purpose and most commonly used, is the one through names. For since it is not possible to bring the things at issue themselves into dialectical arguments, but we use names as symbols[3] instead of things, we think that what follows in the case of the names follows in the case of the things at issue as well, just as in the case of pebbles for those doing rational calculations. But the two are not similar; for names are limited as is the number of statements, while things at issue are unlimited in number. It is necessary, then, for the same statement or a single name to signify several things. Just as in the case of calculation those who are not clever at manipulating the pebbles are cheated by those **165ª1** 5 10

* Translated by C. D. C. Reeve. Text: *Aristotelis Topica et Sophistici Elenchi* (Oxford, 1958; rev. 1984), in consultation with P. Hasper, "Aristotle's *Sophistical Refutations*: A Translation," *Logical Analysis and History of Philosophy* 15 (2013): 13–54.

1. Lead monoxide.

2. Secluding διὰ τῶν κειμένων.

3. Reading χρώμεθα συμβόλοις.

with scientific knowledge, so in the same way in arguments too those inexperienced in the capacity of names argue fallaciously both when arguing themselves and when listening to others.[4]

Due to this cause, then, and others to be mentioned later, there exist both deductions and refutations that are apparent but not real. But since for some people it furthers their work to seem to be wise without being wise rather than to be it without seeming so (for sophistry is apparent wisdom, not real wisdom; and a sophist is someone who makes money from apparent but not real wisdom), it is clear that for them it is also necessary to seem to produce the work of a wise person rather than to produce it and not seem to.

To compare point by point: it is the work of the person who knows a given thing not to speak falsely himself about what he knows, and to be capable of exposing the one who does speak falsely. And of these, the first consists in being capable of giving an argument, the second in being capable of obtaining one. It is necessary, then, for those who wish to play the sophist to look for arguments of the kind just mentioned; for it furthers their work; for a capacity of this sort will make one appear to be wise, which is the end that, having the deliberate choice they have,[5] they aim to achieve.

It is clear, then, that there is a kind consisting of arguments of this sort, and it is this sort of capacity that those we call "sophists" aim at. Let us now speak about how many forms of sophistical arguments there are, how many in number the things are from which this capacity is composed, how many parts there are of their study, and about whatever other things contribute to this craft.

2
Didactic, Dialectical, Examinational, and Contentious Arguments

Of arguments in dialectical discussions, there are four kinds: didactic, dialectical, examinational, and contentious. Didactic ones are those that deduce from the starting-
165b1 points proper to a given subject and not from the beliefs of the answerer (for the learner must take things on trust); dialectical ones are those that deduce from acceptable beliefs in a way that reaches a contradiction; examinational ones are those that deduce from things that seem so to the answerer and that it is necessary for the one to know who pretends to possess the relevant science (in what way has been determined elsewhere[6]); contentious ones are those that deduce or appear to deduce from what appear to be acceptable beliefs, but are not.

4. Ignorance of the fact that there is not a one-to-one correspondence between names and things disposes one to think "same name, same thing," and "distinct name, distinct thing," both of which are false. This is like failing to grasp that the relationship of a pebble to the sheep it stands for need not be one-to-one.
5. *Met*. 1004b22–26, *Rh*. 1355b17–18.
6. *Top*. 8.5–11.

Demonstrative arguments have been spoken about in the *Analytics*, and dialectical and examinational ones elsewhere.[7] About competitive and contentious arguments, let us speak now.

3
Aims of Competitors and Rivals

First, then, we must grasp the number of things that competitors and rivals in arguments aim at. These are five in number: refutation, falsehood, unacceptability, solecism, and, fifth, making the interlocutor babble (and this consists in being compelled to say the same thing repeatedly)—or else, not the real thing, but the appearance of each of them. For competitors and rivals most of all deliberately choose to appear to refute; second, to prove the opponent to be saying something false; third, to lead him into something unacceptable; fourth, to make him commit a solecism (and this is to have made the answerer utter a barbarism by means of the argument); and lastly, to make him say the same thing repeatedly.

4
Modes of Refutation Depending on Speech

The modes of refutation are twofold; for one depends on speech, while the other occurs outside speech. The ways of producing an appearance of refutation depending on speech are six in number. They are homonymy, ambiguity, composition, division, accentuation, and style of speech. For this means of persuasion is through induction—when one assumes another argument to the effect that this is the number of ways in which we can fail to indicate the same thing by the same names or statements—as well as through deduction.

Depending on homonymy[8] are arguments of the following sort: That it is those possessing knowledge who learn (*manthanein*), for it is those who know their letters who understand (*manthanein*) what is dictated to them; for here *manthanein* is homonymous between "understanding by using scientific knowledge" and "acquiring scientific knowledge." Or, again, that evils are good; for what there needs must be is a good, and evil is what there needs must be; for "what there needs must be" is equivocal: [it means] "what is necessary," which often applies to evils (for it is necessary for there to be some evil), and "needed," which we say good things are. Further, "the same person is seated and standing, sick and healthy." For it is the very one who stood up that is standing, and the very one who became healthy that is healthy. But it is the

7. Dialectical ones in the *Topics*; examinational ones perhaps in a lost work.
8. Reading παρὰ τὴν ὁμωνυμίαν.

166ª1 seated one who stood up and the sick one who became healthy. For "the sick person does or suffers such-and-such" does not signify one thing, but at one time "that the person who is now sick . . ." and at another "that the person who was previously sick. . . ." But the person who became healthy was both sick and the person who was sick, while the one who is healthy is not sick, though he is the sick person, not sick now, but the one who was so previously.

Depending on ambiguity are arguments of the following sort: "Wishing that I myself the enemy may capture."[9] Also, "Surely if a person knows a thing, knowing belongs there?" For it is possible to signify as the possessor of knowledge in this statement both the knower and the thing known. Also, "Surely, if a person sees something, seeing belongs there?" But he sees a pillar, therefore seeing belongs to the pillar. Also, "Surely, if you insist on something's being, it you insist on being?" But you insist on a stone's being, therefore you insist on being a stone. Also, "Surely, it is possible for speaking to pertain to the silent?"[10] For "speaking pertaining to the silent" is equivocal between a speaker who is being silent and the things spoken about being so.

There are three modes of arguing that depend on homonymy and ambiguity: One is when a statement or a name strictly speaking signifies several things—for example, "eagle" and "dog."[11] Another is when we customarily use them in that way.[12] A third is when the combination signifies several things, but the separate components signify only one. For example, "scientifically knowing letters"; for it may so happen that each of the two—"knowing" and "letters"—signifies one thing, while the two together signify several, either that the letters themselves have scientific knowledge or that something else has it of them. Ambiguity and homonymy, then, are depended on in these ways.

Depending on composition are arguments of the following sort—for example, "a person is capable of walking while sitting, or writing while not writing"; for it does not signify the same thing if one is dividing and says, capable of "walking-while-sitting," as it does if one is combining; and likewise in the other case, if combining one says, "writing-while-not-writing"; for it signifies that he has the capacity to write while he is not writing. On the other hand, if one is not combining, it signifies that he has the capacity, when he is not writing, to write. Also, "Now he can learn his letters, if indeed he has learned the things he scientifically knows."[13] Further, "Someone who can carry only one thing can carry many."[14]

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9. The ambiguity is syntactical, depending on whether "I myself" is the subject or object of the verb "capture": I wish that I may capture the enemy; I wish that the enemy may capture me.
10. Plato, *Euthydemus* 300b.
11. *Aetos* is an eagle and a sort of fish (*HA* 540ᵇ18); *kuôn* is a dog, a sort of fish, and the Dog Star, Sirius.
12. I.e., they are ambiguous in use, but not strictly, or semantically, so.
13. Reading μανθάνειν . . . ἐμάνθανεν. Plato, *Euthydemus* 277a. If the scope of "now" is both clauses (combination), the thought is that he is learning what he already knows, which is not learning. If the scope is the first clause, the times of learning and knowing can be different (dividing), so that the whole sentence can be true.
14. Many at one time vs. many over many times.

Depending on division: "Five is two and three, that is, even and odd," and "The greater is equal to the less" (for it is so-and-so much and something further besides). For the same statement divided and combined would not always seem to signify the same thing—for example, "I made you a free man slave,"[15] and "Of men one hundred fifty godlike Achilles left alive."[16]

166^{b}1 Depending on accentuation, in dialectical discussions that are not written down, it is not easy to produce an argument, but it is easier in written exchanges and poetry. For example, some people rectify Homer in response to those who refute as absurd his phrase, *to men ou kataputhetai ombrô[i]* ("this is not rotted by the rain"); for they resolve it by a change of accent, saying the ου more sharply. Also, in the passage about Agamemnon's dream, they argue that Zeus did not himself say, *didomen de hoi euchos aresthai* ("we grant him the fulfillment of his prayer") but ordered the dream to grant it.[17] Arguments of this sort, then, depend on accentuation.

Arguments depending on the style of speech come about when what is not the same is communicated in the same way—for example, a masculine by a feminine, a feminine by a masculine, or either of these by a neuter, or again, a quality by a quantity, a quantity by a quality, a doing by a being affected, or a disposition by a doing, and so on for the others that were distinguished previously; for it is possible for something that is not among the doings to signify by its style of speech something that is among the doings.[18] For example, "being healthy (*hugianein*)" is, in its style of speech,[19] said of things in a similar way to "cutting (*temnein*)" or "building (*oikodomein*)"; and yet the former indicates a certain quality and a way of being disposed, the latter a certain doing. And it is the same way in the case of the others.

Refutations depending on speech, then, are based on these topics.

Of fallacies occurring outside speech, on the other hand, there are seven forms: the first depends on the coincident; the second depends on what is said of things unconditionally or instead not unconditionally, but is so in some respect, place, time, or relation; the third depends on ignorance of what a refutation is; the fourth depends on [affirming] the consequent; the fifth depends on assuming what was initially at issue; the sixth depends on positing the non-cause as a cause; the seventh depends on making many questions into one.

15. I made you a free slave (combination); I made you, a free [man], slave (division). Probably a quotation from an unknown comedy.
16. Of men one hundred and fifty he left alive (combination); of men one hundred, fifty he left alive (division).
17. The passage about wood and rain is *Iliad* 23.328, the one about Agamemnon's dream is *Iliad* 2.1–35, but the words quoted are spoken by Poseidon at 21.297. Hippias' identity is uncertain. See *Po*. 1461^{a}22–23.
18. *Top*. 1.9.
19. *Po*. 1456^{b}9.

5
Fallacies Depending on the Coincident

Fallacies depending on the coincident come about when it is claimed that any affection whatever belongs in the same way to the thing at issue and to its coincident. For since many coincidents belong to the same thing, it is not necessary for all these[20] to belong to what is predicated of the thing as belong to the thing they are predicated of. For example, "If Coriscus is other than a human, he is other than himself, for he is a human." Or, "If he is other than Socrates, and Socrates is a human," then, so they say, "the opponent has agreed that Coriscus is other than a human," because it happens coincidentally that the one he said that Coriscus was said to be other than is a human.[21]

Those depending on what is said of things unconditionally, or instead of things in some respect and not strictly, come about when what is said of things partially is taken as if it applied unconditionally[22]—for example, "If what is not is believable, then what is not is"; for "to be something" and "to be" unconditionally are not the same. Or again, "What is, is not" (if it is not one of the things that is—for example, a human being); for it is not the same thing not to be something and not to be unconditionally. But it appears to be so, because of closeness in speech: "to be something" differs little from "to be," and "to not be something" from "to not be."

Similarly, with the dependence on what is so in a certain respect and what is so unconditionally—for example, the Indian, being wholly black, is white in tooth, therefore he is white and not white. Or, if both affections belong in a certain respect, that contraries belong at the same time. In some cases this sort of fallacy is easily seen by everyone—for example, if having obtained that the Ethiopian is black, the questioner were to ask, whether he was white in tooth; and then, if he obtained that he is white in that respect, he were to think that he had dialectically proved that he was black and not black, because he had reached the end of his questioning with a deduction. In other cases, however, the fallacy is often undetected: wherever, when something is said to be so in a certain respect, its being unconditionally so would also seem to follow, and in those where it is not easy to see which of them is to be assigned in a strict way. This sort of thing occurs when opposites belong in a similar way; for then it seems that either both or neither must be granted to be predicated[23] unconditionally—for example, if something is half white or half black, is it white or black?

20. Reading ταῦτα.

21. The claim is not that Coriscus is coincidentally a human: he is intrinsically and essentially a human. Rather the description, "the one he said that Coriscus was said to be other than," happens to pick out a human. If the one in question is a lion, this would not be so.

22. *APo*. 90ᵃ2–5.

23. Reading κατηγορεῖν.

Fallacies depending on the non-determination of what a deduction is, or what a refutation is, instead[24] depend on an omission from the account [of refutation]. For a refutation is a contradiction of one and the same thing, not of the name but of the thing at issue, and not of a synonymous name, but of the same one, following of necessity from the things granted (not counting what was initially at issue), in the same respect, in relation to the same thing, in the same way, and at the same time. (And it is the same way too in the case of stating a falsehood about something.) Some people appear to refute by omitting one of the stated conditions—for example, arguing that the same thing is the double and not the double; for two is the double of one, but not the double of three. Or, if the same thing is the double and not the double of the same thing, but not so in the same respect; for it is double in length but not double in breadth. Or, if it is the double and not the double of the same thing and in the same respect and way, but not at the same time. That is why there is only an apparent refutation. (One might drag one of this sort into the class of those depending on the speech.)

The ones that depend on assuming what was initially at issue come about in the same way, and in the same number of ways, as those that demand what was initially at issue. They appear to refute because of the incapacity to take a comprehensive view of sameness and distinctness.

167b1 A refutation that depends on [affirming] the consequent is due to thinking that the consequence is convertible; for when, if A is so, B is of necessity so, people also think that if B is so, A is also of necessity so. It is from this too that deceptions concerning belief based on perception come about; for people often take bile for honey because honey is followed along by a yellow color. Also, since the ground becomes wet following rain, if it is wet, we assume that it has rained. But this is not necessarily so. In rhetorical arguments, demonstrations in accord with a sign[25] are based on things that follow; for when speakers wish to prove that a person is an adulterer, they take hold of the consequent—that he is well-dressed or that he is seen wandering about at night.[26] But these affections belong to many people of whom the predicate [adulterer] does not belong. It is likewise too in deductive arguments—for example, the argument of Melissus[27] that the universe is unlimited assumes that the universe cannot come to be (for nothing can come to be from what is not) and that everything that has come to be has come from a starting-point; if, then, the universe has not come to be, it has no starting-point,[28] and so is unlimited. But this does not necessarily follow; for even if what has come to be always has a starting-point, it does not also follow that what has a starting-point has come to be—any more than if a feverish person is hot, it is necessary that a hot one has a fever.

24. Reading ἀλλὰ.
25. *APr*. 70a6–24, *Rh*. 1357b1–17.
26. *Rh*. 1401b23–24.
27. 170b21–24, *Ph*. 1.2
28. Reading ἀρχὴν οὐκ ἔχει.

A refutation depending on taking the non-cause as cause comes about when what is not a cause is added as if the refutation's coming about depended on it. This sort of thing happens in deductions leading to an impossibility; for in these it is necessary to do away with one of the things proposed. If, then, what is not a cause is counted among the questions that are necessary for establishing the resulting impossibility, the coming about of the refutation will often seem to depend on it. For example, the following argument that soul and life are not the same: If coming to be is in fact contrary to passing away, to a certain sort of passing away a certain sort of coming to be is contrary; but death is a certain sort of passing away and is contrary to life; so life is a coming to be and to be alive is to be coming to be; but this is impossible; therefore, soul and life are not the same. But the conclusion is not deduced at all; for the impossibility results even if one does not say that life and soul are the same, but only that life is contrary to death, which is a passing away, and that coming to be is contrary to passing away. Arguments of this sort are not unconditionally non-deductive, but in relation to the thing proposed they are non-deductive. And this sort of thing often goes no less unnoticed by the questioners themselves.

Arguments depending on the consequent and the non-cause, then, are of this sort. Those depending on the making of two questions into one come about when the plurality is not noticed and one answer is given as if to one question. In some cases it is easy to see that there are several questions involved and that one must not give one answer—for example, "Is the earth sea, or is the sky?" In other cases, however, it is less easy, and, on the supposition that it is really one, people either concede by not answering what is being asked or appear to be refuted. For example, "Is A a human and is B?"[29] So, were someone to strike this one and that one, he would strike *a* human and not human*s*.

Or, again, the things among which some are good and some bad, are they all good or not good? For whichever the answerer says would seem to produce either refutation or evident falsehood; for to say that something not good is good, or that something good is not good, is false. Sometimes, if certain premises are added, a genuine refutation might come about. For example, if one grants that one thing and several things are alike said to be white, naked, or blind. For if one thing's being blind is its not having sight when it is natural to have it, several things' being blind will also be their not having sight when it is natural to have it. When, then, one has sight while another does not have it, they will either both be able to see or both be blind—which is just impossible.

29. If the answerer says "yes," he is apparently refuted. Why? Because then it would follow that if someone strikes A and B he would strike one human not two humans. Why? The questioner is asking, "Is A = a human X and is B = a human Y?" There is no presupposition that X = Y. A "yes" answer, however, since it presupposes that only one thing is being asked, does presuppose that X = Y, and so that A = B. But that is not what is being presupposed or asked.

6
Fallacies Based on Ignorance of What a Refutation Is

We must either divide apparent deductions and refutations in this way, or drag all of them into the class of those ignorant of refutation, making this a starting-point; for it is possible to resolve all the ways mentioned into that of the definition of refutation.

First, see whether they are non-deductive; for the conclusion must follow from the things proposed, so that to state it is a matter of necessity, and does not merely appear to be so. Next, we must also see if they are in accord with the [other] parts of the definition. For of those lying in the speech, some depend on equivocation—for example, homonymy, [ambiguity in] the statement, uniform style of speech (for we habitually speak of everything as if it signified a this something); but composition, division, and accentuation are due to the statement not being the same or to the name being different. For the name too, like the thing at issue, must be the same, if there is going to be a refutation or a deduction—for example, if the thing at issue is a cape, do not deduce cloak, but cape. For though the latter is also true, it is not deduced, but rather a further question must be asked, to satisfy the one looking for the why, as to whether "cloak" signifies the same thing.

Those depending on the coincident become evident when deduction is defined. For the same definition must also apply to refutation, except for the addition of a contradiction; for a refutation is a deduction of a contradiction. If, then, there is no deduction of what is coincidental, no refutation comes about. For if, when A and B are, C must of necessity be, and C is [coincidentally] white, there is no necessity for it to be white because of the deduction. Nor, if a triangle has angles equal to two right angles, and it is coincidentally a figure, primary thing, or starting-point, is it because **$168^{b}1$** it is a figure, starting-point, or primary thing that it has this affection; for it is not insofar as it is a figure or a primary thing that the demonstration comes about, but insofar as it is a triangle. And similarly in the other cases too.

So, if a refutation is a sort of deduction, one directed at a coincident would not be a refutation. And yet both craftsmen and scientists generally are refuted by non-scientists on the basis of this; for the deductions they produce against those who know are directed at a coincident, while the latter, being incapable of drawing [the relevant] distinctions, either grant when questioned or, though they did not grant, are thought to have granted.

Fallacies depending on what is so in a respect and what is so unconditionally come about because the affirmation and the denial are not of the same thing. For not white in some respect is the denial of white in some respect, and not unconditionally white of unconditionally white. If, then, the questioner takes the concession that something is white in some respect as saying that it is unconditionally so, he does not produce a refutation, but appears to do so because of ignorance of what a refutation is.

The most evident fallacies (*paralogismos*) of all are those already mentioned[30] as depending on the definition of refutation. That is why indeed they are so called; for it is by depending on (*para*) an omission from the account (*logos*) that the appearance [of refutation] comes about. And if we divide fallacies in this way, we must posit as common to all these cases an omission from the account.

Also,[31] those that depend on assuming what was initially at issue and positing the non-cause as cause are made clear by the definition. For the conclusion must result "because of these things being so," which is precisely what does not hold in the case of non-causes. And, again, the conclusion must follow "without counting what was initially at issue," which is precisely what does not hold of those that depend on demanding what was initially at issue.

Those depending on [affirming] the consequent are a part of those that depend on the coincident; for a consequent is a coincident, but differs from a coincident because a coincident can be obtained in the case of one thing only (for example, that the same thing is something yellow and honey, or white and a swan), while the consequent[32] always involves several things; for we claim that things that are the same with respect to one and the same [third] thing are also the same as each other; which is why a refutation depending on [affirming] the consequent comes about. But this claim is not entirely true—for example, where it is with respect to a coincident; for both snow and swan are the same with respect to white.

Or, again, as in the argument of Melissus,[33] the questioner assumes that having come to be and having a starting-point are the same thing, as are becoming equal and taking on the same magnitude. For because what has come to be has a starting-point, he also claims that what has a starting-point has come to be, on the supposition that these two things, what has come to be and what has a limit, are the same thing as having a starting-point. Similarly too, in the case of things that have become equal, he assumes that if things taking on one and the same magnitude are becoming equal, then things that are becoming equal are also taking on one and the same magnitude. So he assumes the consequent. Since, then, the refutation depending on the coincident lies in the ignorance of refutation, it is evident that the one that depends on [affirming] the consequent does so too. But we must look at this issue from another point of view as well.[34]

Fallacies depending on making several questions into one are due to our failure to articulate the account of what a premise is. For a premise is one thing said of one thing; for the same definition applies to one single thing and unconditionally to the thing—for example, to a human and to one single human.[35] And it is the same way

30. 167ᵃ21–35.
31. Reading τε.
32. Reading παρεπόμενον.
33. 167ᵇ12–20.
34. Chapters 24 and 28.
35. *Met.* 1003ᵇ26–29.

in the other cases too. If, then, one premise claims one thing of one thing, a question of this sort will be unconditionally a premise.[36] And since a deduction is based on premises, and a refutation is a deduction, a refutation is also based on premises. If, then, a premise is one thing said of one thing, it is evident that this fallacy too lies in ignorance of what a refutation is; for in it what appears to be a premise is not really a premise. If, then, a person has given an answer as though to one question, there will be a refutation, but if he has not given one, but only appears to have done so, there will be only an apparent refutation.

So all the modes[37] [of refuting] fall into the province of ignorance of what a refutation is: those depending on speech because the contradiction—which is precisely what we saw to be special to refutation—is only apparent, and the others because they depend on the definition of a deduction.

7
Sources of Deception in Fallacies

In fallacies depending on homonymy and [ambiguity in] the statement, the deception comes about due to being incapable of distinguishing the many ways in which they are said (for in some cases distinguishing them is not puzzle-free—for example, one, being, and same).[38] In those depending on composition and division, on the other hand, the deception is due to thinking that it makes no difference whether the statement is combined or divided, as in most cases. It is similar too in the case of those depending on accentuation; for a word or statement pronounced with a lower and with a higher pitch seldom if ever seems to signify something distinct.

In those depending on the style, the deception is due to similarity in speech. For it is difficult to distinguish what sorts are said of things in one way, what sorts in another way (for the one capable of doing this is pretty much next door to seeing the truth, and it is he most of all who knows when to join in conceding them), because we take everything predicated of a thing to be a this something, and [so] we make our concession as if to one thing; for it is to what is one and a substance that this something and being seem most of all to pertain. This is also why this mode [of refuting] must be put among those depending on speech: first, because the deception occurs more when we are investigating with others than by ourselves (for an investigation with another is through words, while one by oneself is no less through the thing at issue itself[39]); next, because even by oneself one happens to be deceived when one makes one's investigation on the basis of words; still, the deception originates in similarity, and the similarity in speech. **169b1**

36. *Top*. 101b28–33.
37. Reading τρόποι.
38. *Met*. 5, 6, 7, and 9.
39. *Int*. 16a3–8.

In fallacies depending on the coincident, the deception comes about because of not being able to judge same and distinct, one and many, and what sorts of predicates have all the same affections as the thing at issue. It is the same way too in those that depend on [affirming] the consequent; for the consequent is a particular case of the coincident. Further, in many instances it appears to be—and is claimed to be—the case that if this cannot be separated from that, then that cannot be separated from this either.

In fallacies depending on an omission from the account [of what a refutation is] and those depending on what is so in a respect and what is so unconditionally, the deception lies in depending on the smallness of the difference involved; for treating the particular case, the respect, the way, and the time as having no additional signification, we concede universally. It is the same way too in the case of those assuming what was initially at issue, those of the non-cause, and those making many questions into one; for in all these the deception is due to depending on the smallness of the difference involved; for we do not investigate in exact detail either the definition of a premise or that of a deduction due to the cause just stated.[40]

8
Sophistical Refutations

Since we have hold of the number of things apparent deductions depend on, we also have hold of the number sophistical deductions and refutations may depend on. And by a "sophistical refutation" and "sophistical deduction" I mean not only an apparent deduction and refutation that is not really one, but also one that, though real, only appears to be proper to the thing at issue. These are the ones that refute and prove people to be ignorant—which, as we saw,[41] is precisely what it belongs to the examinational craft to do—not in accord with the thing at issue. The examinational craft, though it is a part of dialectic, is capable of deducing a falsehood due to the ignorance of the one conceding the argument. Sophistical refutations, by contrast, even if they deduce the contradictory [of what he proposes], do not make clear whether he is ignorant; for people trip up even those who do know with arguments of this sort.

That we get hold of them by the same methodical inquiry is clear; for the things depending on which it appears to listeners that something has been deduced as a result of questions are the same as those[42] depending on which the answerer would think so too, so that there will be false deductions through all or some of these; for what, without being questioned, one thinks one has granted, one would also grant if questioned. Except, of course, in those cases in which it happens that as soon as the question on the missing point is added, its falsehood becomes evident—for example,

40. 169b10–12.
41. 165b4–6.
42. Reading ταῦτα.

in [fallacies] depending on speech and on solecisms. If, then, fallacious deductions of the contradictory depend on apparent refutation, it is clear that deductions of false conclusions must also depend on the same number of things as an apparent refutation does.

An apparent refutation, however, depends on the parts of a true one; for if a given part is omitted, there would be only an apparent refutation. For example, the one depending on what does not follow because of the argument[43] (the one leading to impossibility); also, the one making two questions into one,[44] depending on the premise; also, instead of the intrinsic, depending on the coincident, and—which is a part of this one—the one depending on [affirming] the consequent.[45] Further, the one that follows not in the case of the thing at issue,[46] but in that of the word; next, instead of the contradictory being universal[47] (and being so in the same respect, in relation to the same thing, and in the same way), depending on a particular case, or depending on one or other of these things; further, depending on not counting what was initially at issue, the one assuming what was initially at issue.[48] Thus we may have hold of how many things fallacies come about by depending on; for they could not depend on more things, but all will depend on the ones just mentioned.

A sophistical refutation is not unconditionally a refutation, but rather one in relation to someone, and the deduction is the same way. For, if the refutation that depends on a homonym does not obtain that it signifies one thing, and the one depending on a uniform style of speech does not obtain that it signifies a this [something] only, and the others in the same way, they will not be either a refutation or a deduction, either unconditionally or in relation to the answerer. But if they do obtain these things, while they will be a refutation or a deduction in relation to the answerer, they will not be so unconditionally; for they have obtained not that they do signify one thing but that they appear to, and from a particular person.

9
The Nature of Dialectic

Without having a scientific knowledge of all the beings, one must not try to get hold of how many things the refutations of those people who are refuted depend on. This, however, does not belong to any craft;[49] for the sciences are perhaps unlimited in number, so that it is clear that their deductions are as well. Plus there are also true

43. 167^{b}21–36.
44. 169^{a}6–16.
45. 168^{b}27–35.
46. 167^{a}21–35.
47. 167^{a}7–20.
48. 167^{a}36–39.
49. Reading οὐδεμιᾶς.

refutations [as well as false or sophistical ones]; for wherever demonstration is possible, it is also possible to refute a person who posits the contradictory of the truth—for example, if someone posits the commensurability of the diagonal, one could refute him by demonstrating that it is incommensurable. So we would need to be scientific knowers of everything; for some refutations will depend on the starting-points in geometry and their conclusions, others on those in medicine, while others depend on those of the other sciences.

But then false refutations likewise also exist in unlimited numbers;[50] for in accord with each craft there is a false deduction—for example, in accord with geometry a geometrical one, and in accord with medicine, a medical one. And by "in accord with a craft" I mean in accord with its starting-points.

It is clear, then, that we must get hold of the topics, not of all refutations, but of those that depend on dialectic; for these are the ones that are common to every craft and every capacity. And as regards the refutation that is in accord with a particular science, it belongs to the corresponding scientist to get a theoretical grasp on whether it, not being a real one, only appears to be one, and if it is a real one, on why it is so. But to get one on a refutation based on what is common, and that falls under no craft, belongs to dialecticians. For if we have hold of what acceptable deductions about anything whatever are based on, we have hold of what refutations are based on; for a refutation is a deduction of a contradictory, so that [to have hold of] one or two deductions of a contradictory is [to have hold of] a refutation.

We have hold, therefore, of the number of things all refutations of this sort depend on. And if we have hold of this, we also have hold of their resolutions; for the objections to these are the resolutions. We also have hold, then, of the number of things that apparent refutations depend on—apparent, that is, not to anyone whatever, but rather to those of the sort mentioned;[51] for if one were to investigate the number of things they depend on to appear so to random people,[52] it would go on indefinitely. So it is evident that to the dialectician it belongs to be capable of getting hold of the things that a refutation, or apparent refutation, that comes about through what is common depends on, that is, a dialectical one or an apparently dialectical or examinational one.

10
Arguments against the Name versus against the Thought

The difference among arguments that some people[53] state when they say that some arguments are directed against the name, others against the thought, does not exist; for it is absurd to suppose that some arguments are directed against the name, others

50. Reading ὁμοίως ἐν ἀπείροις.
51. I.e., dialectically competent ones.
52. *EE* 1214b29–1215a2.
53. Speusippus F69a–b Tarán.

against the thought, rather than the same ones. For what is it not to be directed against the thought except what happens when the questioner does not use the name to apply to what the person being questioned was thinking of when he conceded? And this is the same as to be directed against the name; while it is directed against the thought when the name is used to apply to what the person being questioned was thinking of.

If, then, when a name signifies several things, some people—both the questioner and the one being questioned—were to think that it signifies one thing (for example, "being" and "one" presumably signify several things, but the answerer as well as the questioner in asking his questions are thinking they signify one thing, and the argument is that all things are one), will it have been dialectically argued against the name or against the thought of the one questioned? But, if indeed someone thinks that it signifies several things, it is clear that it is not against the thought. For, first, [the distinction between] being directed against the name and against the thought concerns the sorts of arguments that signify several things, and, next, concerns any argument whatever; for its being directed against the thought does not lie in the argument, but rather in the answerer's being disposed in a certain way toward what has been granted. Next, it is possible for all arguments to be directed against the name; for, on the view under discussion, to be directed against the name is not to be directed against the thought. For if not all admit either of being directed against the name or against the thought, there will be another lot that is neither directed against the name nor against the thought. But these thinkers say all admit of it—that is, that all are divided either into those directed against the name or those directed against the thought, and there are no others.

But then again, among those deductions depending on what is [said in] many ways, [only] some depend on the name. For it is also absurd for them to say that "depending on the name" describes all arguments that depend on speech; on the contrary, there are some arguments that are fallacious not because of the answerer's being disposed in a certain way toward them, but because the argument itself involves asking the sort of question that signifies more than one thing.

Also, it is wholly absurd to discuss refutation without previously discussing deduction; for a refutation is a deduction, so that we must also discuss deduction before false refutation; for a refutation of this sort is an apparent deduction of a contradiction. That is why, if there is an apparent refutation, the cause [of its falsity] will lie either in the deduction or in the contradiction (for the contradiction must be added), but sometimes in both. In the case of "speaking pertaining to the silent," it lies in the contradiction,[54] not in the deduction; in that of "giving away what one

54. "Can speaking pertain to the silent?" "No." "Can speaking pertain to a stone?" "Yes." (Implicit) "Is a stone silent?" "Yes." "Then, speaking can pertain to the silent." This deduction is unproblematic, since there is a univocal interpretation of its premises and conclusion under which it is sound. But there is a problem with the conclusion, since it is ambiguous between a speaker who is being silent and the thing spoken about being so.

does not have," it lies in both;[55] in that of "Homer's poetry being a figure because of being a cycle,"[56] it lies in the deduction. An argument that errs in neither respect is a true deduction.

To return to the point from which the argument digressed: Are arguments in mathematics directed against the thought or not? If someone believes that "triangle" signifies many things, and has granted what he granted not on the supposition that this is the figure about which the questioner has deduced the conclusion that it contains two right angles, has the questioner argued dialectically against the answerer's thought or not?[57]

Further, if the name signifies several things, but the answerer does not understand or think it to do so, how has the questioner not argued dialectically against the thought? Or how else must the question be asked except by conceding a distinction? Suppose then[58] someone asks, "Is it or is it not possible for speaking to pertain to the silent, or is the answer in one way no and in another way yes?" Then, if the answerer does not grant anything, and the questioner continues to argue dialectically, has he not argued dialectically against the thought? And yet the argument seems to be one of those depending on the name. Therefore, there is not any kind of argument directed against the thought.[59] But there are those directed against the name. And yet these do not include all refutations, not only not all real refutations but not even all apparent refutations. For there are also apparent refutations that do not depend on speech—for example, those depending on the coincident and others.

But if someone requires distinctions to be drawn, [for example,] that "By 'speaking pertaining to the silent' I mean sometimes one thing and sometimes another," the

55. "Can someone give what he does not have?" "No." "Can someone give with pleasure what he does not have with pleasure?" "Yes." "Then, someone can give what he does not have." Here the problem is in the deduction and in the contradiction because the initial question is ambiguous between having unconditionally and having in a way, and no univocal interpretation makes the deduction valid.

56. Reading κύκλου. "Is a cycle (circle) a figure?" "Yes." "Is Homer's poetry a cycle?" "Yes." "Then, Homer's poetry is a figure." The problem is in the deduction because it treats the "is" of predication as being the "is" of identity. See *APo*. 77ᵇ31–33.

57. The answerer grants (1) that triangle$_x$ has three interior angles. The questioner soundly deduces the conclusion that (2) the angles of a triangle equal two right angles. The answerer objects (3) that when he granted (1) he took it to be about triangle$_x$, not about triangle. However, the answerer's view that "triangle" signifies many things is false, since "triangle" is in fact univocal. So mathematically speaking, questioner has established (2). The question is, has he established it dialectically? The answer is not so clear.

58. Reading εἶτα.

59. Suppose N is a name said of things in ways W_1 and W_2. Is such-and-such N or not? is an ambiguous question. But it can be transformed into a non-ambiguous one by addition: Is such-and-such N or not, or is it N in W_1 and not N in W_2 or vice versa? If it is not now directed against the thought, then no argument will be. Why? Because the basis for thinking it was directed against the name has been removed. We will be left, then, contrary to the view under discussion, only with arguments directed against the name.

requirement is in the first place absurd; for sometimes the question does not seem to involve [something said in] many ways, and it is impossible to draw a distinction one does not think exists. Next, what else will teaching be but this? For it will make evident how things stand to one who has neither investigated nor knows nor supposes that the thing is said in another way; since what is to prevent this from also being done in cases that do not[60] involve an equivocal signification? "Are the units present in four equal to those present in two? But some twos[61] are present in one way, others in another way." Also, "Is the science of contraries one or not? But some contraries are known, others are not." So a person who makes this demand seems to be ignorant of the fact that teaching is distinct from arguing dialectically, and that a person who is teaching must not ask questions but himself make things clear, while the second must ask questions. **$171^{b}1$**

11
The Examinational Craft

Further, to require an answerer either to affirm or deny is the business not of the person who is proving something but of the one conducting an examination; for the examinational craft is a sort of dialectic and has in view not the person who knows, but the one who is ignorant and pretends to know. The one who gets a theoretical grasp on what is common,[62] as it applies to the thing at issue, is a dialectician, while the one who apparently does so is a sophist. Also, there is a contentious and a sophistical deduction: in the first instance, this is [only] apparently deductive about the things that dialectic is examinational about, even if the conclusion is true (for it is deceptive about the why); and there are those fallacies that are not in accord with the methodical inquiry concerning each of the things, yet seem to be in accord with the craft. For falsely drawn diagrams[63] are not contentious arguments (for the fallacies are in accord with what falls under the craft), certainly not if what the falsely drawn figure concerns is true—for example, the one of Hippocrates, that is, the squaring of the circles by means of lunes. Bryson's way of squaring the circle, on the other hand, even if the circle is squared, is nonetheless sophistical, because it is not in accord

60. Reading μὴ.
61. Reading δυάδες.
62. $170^{a}35–36$.
63. These are falsely drawn in the following sense: they include irrelevant elements on which the deduction actually depends (*Top*. $167^{a}1–3$), so that it is the person who knows that it depends on these who knows how to resolve them ($165^{b}35–36$). But while these elements themselves are neither true nor primary starting-points of geometry ($101^{a}9–10$), the *apparent* deduction embodied in the falsely drawn diagram *is* based on the starting-points and conclusions of geometry (*SE* $172^{a}1–2$, *Ph*. $185^{a}15$), which is why it can deceive even a geometer (*Top*. $132^{a}32–33$), but the actual deduction, which includes the irrelevant elements, is of broader application, because those elements are (*SE* $172^{a}5–6$).

with the thing at issue. So, then, any apparent deduction concerning these things is a contentious argument, and any deduction that appears to be in accord with the thing at issue, even if it is a deduction, is a contentious argument; for it only appears to be in accord with the thing at issue, and so is deceptive and unjust.

For just as injustice in a competition is of a certain form and is a sort of unjust fighting, so in arguing against another, contentious argument is unjust fighting; for in the former case those who deliberately choose to win in any way use all the means, and in the latter case so do contentious arguers. Those, then, who do this for the sake of victory itself seem to be contentious and disputatious human beings, while those who do it for the sake of reputation, with a view to making money, are sophists; for sophistry, as we said,[64] is a sort of craft of making money from apparent wisdom. That is why they seek apparent demonstration, and why, while the arguments of disputatious people and sophists are the same,[65] they are not for the sake of the same things; and the same argument is both sophistical and contentious, though not in the same respect, but rather insofar as it is for apparent victory,[66] it is contentious, while insofar as it is for apparent wisdom, it is sophistical; for in fact sophistry is a sort of appearance of wisdom without the reality.

A contentious arguer stands in something of the same relation to a dialectician as a drawer of false diagrams does to a geometer; for it is on the basis of the same things as those used by dialectic[67] that a drawer of false diagrams leads the geometer[68] to fallacious reasoning. But a drawer of false diagrams is not a contentious arguer, because he draws his false diagrams on the basis of the starting-points and conclusions that fall under the craft [of geometry]. It is clear that the one arguing about the others on the basis of those that fall under dialectic is a contentious arguer. For example, the squaring of the circle by means of lunes is not contentious, while Bryson's way is contentious; and while it is impossible to transfer the former to other subjects (on the contrary, it is directed against geometry only, because it is based on starting-points that are special to it), the former is directed against many people, namely, the ones who do not know what is possible and what is impossible in a given case; for the argument will apply [to many things].[69] Or there is the way Antiphon squared the circle.[70] Or, again, if someone were to deny that it is better to take a walk after dinner because of Zeno's argument,[71] it would not be doing medicine; for it is common. If, then, a contentious arguer stood in every respect in the same relation to a dialectician

64. 165ᵃ21–23.
65. Secluding οἱ[2] and reading εἴσιν.
66. Rejecting the addition of ἕνεκα.
67. Reading τῇ διαλεκτικῇ.
68. Reading τὸν γεωμέτρην.
69. I.e., to numbers, times, places, and other common things.
70. I.e., by assuming that a circle was a polygon with a large but finite number of sides.
71. *Top*. 160ᵇ8–10.

as a drawer of false diagrams does to a geometer, a contentious argument concerning those things would never have existed.

As things stand, dialectical argument is not concerned with a definite kind, nor is it probative of anything, nor is it even of the same sort as the universal one. For all the beings are not in one kind either, nor, if they were, would it be possible for them to fall under the same starting-points. So none of the crafts proving a certain nature[72] is interrogative; for it is not possible to grant whichever of the two parts [one happens to choose]; for a deduction does not come about on the basis of both. But dialectic is interrogative, while if it proved anything, it would not ask questions, if not about everything, at any rate, not about the primary things and the starting-points proper [to a given science]; for if an answerer does not grant these, one would not have anything further on the basis of which one will further argue dialectically against an objection.

And the same craft is also examinational; for the examinational craft is not of the same sort as geometry either, but is rather one that someone could possess even without having knowledge. For even someone who does not know the thing at issue can undertake an examination of someone who also does not know it, if indeed the latter makes concessions based not on what he knows nor based on things special [to the subject matter of the relevant craft], but on their consequences—that is, on whichever things are of the sort that someone can know without knowing the craft in question, but which if he does not know, he is necessarily ignorant of the craft.

So it is evident that the examinational craft is not the scientific knowledge of anything definite. That is why it is also concerned with everything; for all the crafts also make use of certain common things. That is why everyone, even private individuals, makes a certain use of dialectic and the examinational craft; for everyone tries, up to a certain point, to test those who profess knowledge. And these are the common things; for they themselves know these no less [than the others do], even if they seem to speak from very far outside [the relevant sort of knowledge]. All, then, practice refutation; for they share in an un-craftlike way in what dialectic does in a craftlike one, and the one who by means of the craft of deduction is examinational is a dialectician.

Since there are many of these [common things] and[73] they apply with respect to everything, and are not such as to constitute a certain nature and kind, but instead are like negations, while others are not of this sort but special, it is possible, on the basis of them, to undertake an examination about anything, and for this to constitute a certain craft, though one that is not like the sorts that prove things. That is precisely why a contentious arguer does not in all respects stand in the same position as a drawer of false diagrams; for a contentious arguer will not argue fallaciously on the basis of the starting-points of a definite kind, but about every kind. **172b1**

72. 172a37–38.
73. Reading ταῦτα καὶ.

These, then, are the modes of sophistical refutation. And that it belongs to the dialectician to get a theoretical grasp on them, and to be capable where these are concerned, is not difficult to see; for the methodical inquiry concerned with premises includes this entire theoretical investigation.

12
False and Unacceptable Things

And so about apparent [or sophistical] refutations, we have now spoken. As for proving the opponent to be saying something false and leading the argument into something unacceptable (for this was second in the deliberate choice of the sophist[74]), in the first place this most of all results from getting answers in a certain way and through the questioning. For asking questions directed against[75] no definite proposal is useful in hunting things of this sort;[76] for people are more likely to commit errors when they speak at random, and they speak at random when they have nothing that has been proposed to them. Also, asking several questions, even if what one is dialectically arguing against is something definite, and demanding that the answerer say what he believes,[77] makes one well equipped to lead the answerer[78] into something unacceptable or false, and, if he affirms or denies one of these when questioned, to lead him into things that one is well equipped to attack. Nowadays, though, questioners are less able to do mischief by these means than they were previously;[79] for people demand to know what this has to do with what was initially at issue. An element [or topic] indeed for eliciting a falsehood or something unacceptable is not to ask for any posit directly, but to say that one put questions wishing to learn; for this way of investigating leaves room for an attack.[80]

For proving the opponent to be saying something false, a topic special to sophistry is to lead the answerer into the sorts of things one is well equipped with arguments against. But it is possible to do this both correctly and incorrectly, as was said previously.[81]

Again, for [getting people] to say unacceptable things, look to see what group the one arguing dialectically belongs to, and then question him on something this group says that to most people is unacceptable; for in the case of each school there is something of this sort. An element (or topic) in these cases is having the theses of each group among the premises one has hold of. The fitting resolution to these too is

74. 165[b]14.
75. Reading πρὸς.
76. I.e., in achieving the second (and third) aim of sophists.
77. Plato, *Crito* 49c–d, *Gorgias* 500b–c, *Protagoras* 331c–d.
78. Reading ἄγειν.
79. *Met*. 987[b]32–33, 1078[b]25–27.
80. Reading ἐγχειρήματος.
81. The reference seems to be to *Top*. 2.5.

to bring to light[82] the fact that the unacceptable thing does not result because of the argument, which is what the opponent always really wishes.

Further, [argue] on the basis of things wished for and on professed beliefs; for people do not wish for the same things they say they do, but say the words that make them look best, while they wish for the things that appear most profitable.[83] For example, they say that one should die nobly rather than live pleasantly, and live in just poverty rather than in shameful wealth; but they wish for the contraries. A person, **173^{a}1** then, who speaks in accord with his wishes must be led to state his professed beliefs, while one who speaks in accord with those must be led to state his secret ones; for in either case it is necessary to speak in an unacceptable way; for they will speak contrary either to professed beliefs or to non-professed ones.

But to make people say unacceptable things, the most efficacious topic, as Callicles is represented as stating in the *Gorgias*,[84] and which all the ancients thought conclusive, is the one that depends on what is in accord with nature and what is in accord with convention; for nature (they said[85]) and convention are contraries, and justice is a noble thing according to convention, but according to nature it is not noble. Against a person who speaks in accord with nature, then, one must (they said) respond in accord with convention, while against one who does so in accord with convention one must lead [the argument] to nature; for in both ways it is possible to say[86] unacceptable things. In the view of the ancients, what is in accord with nature was the truth, while what is in accord with convention was what seemed so to many. So it was clear that they too, like those nowadays, tried to refute the answerer, or make him say unacceptable things.

Some questions are such that the answer is unacceptable either way—for example, whether one should obey the wise or one's father, whether one should do what is advantageous or what is just, or whether it is more choiceworthy to suffer injustice or to do harm. One must lead the argument into what is contrary to the views of ordinary people or[87] to the wise—if someone speaks like those who have to do with arguments, into those of ordinary people, if like ordinary people, into those involved in argument.[88] For the latter say that the happy person is of necessity just, while it is unacceptable to ordinary people that a king not be happy.[89] Leading an argument in this way into things that are unacceptable is the same as leading them into the contrariety between what is in accord with nature and what is in accord with convention; for convention is the belief of ordinary people, while the wise speak in accord with nature and truth.

82. Reading τὸ ἐμφανίζειν.
83. *Rh*. 1399^{a}28–31.
84. Plato, *Gorgias* 482e–483a.
85. Reading φασι φύσιν.
86. Reading εἶναι λέγειν.
87. Rejecting the addition of τὰ.
88. Reading τοῖς ἐν λόγῳ.
89. Plato, *Gorgias* 470e.

13
Babbling

Unacceptable things, then, must be looked for on the basis of these topics. As for making people babble, we have already said[90] what we mean by "babbling." All arguments of the following sort wish to do this. If it makes no difference whether one says a name or a statement, and double and double of half are the same thing, then if double is double of half,[91] it will be double of half of half. And if "double of half" is again put in place of "double," the expression will be used three times, "double of half of half of half." Also, is appetite for something pleasant?[92] But appetite is desire for something pleasant. Therefore, appetite is desire for something pleasant for something pleasant.

173b1 All arguments of this sort lie in relatives, where not only the kinds but also the things themselves are said in relation to something, and in relation to one and the same thing (for example, desire is desire for something, appetite is appetite for something, and double is double of something: double of half); also where, though the things themselves are not relatives at all, yet the substance, what they are states, affections, or the like of, is indicated in their accounts, since they are predicated of[93] these things. For example, the odd is having-a-middle-number. But there is an odd number; therefore, there is a having-a-middle-number number. And if the snub is concavity in a nose, and there is a snub nose, then there is a concave nose nose.[94]

Questioners sometimes appear to produce babbling, while not really doing so, because they do not get a further answer[95] as to whether "double," said by itself, signifies something or not, and, if it does signify something, whether it signifies the same thing or a distinct one, but instead they state the conclusion straightaway. But because the name is the same, it also appears to signify the same thing.

14
Solecisms

What sort of thing a solecism is has already been stated.[96] It is possible to commit one, to appear to do so without doing so, and to commit one without seeming to, just as Protagoras used to say happened, if *mênis* ("anger") and *pêlêx* ("helmet") are

90. 165b15–17.
91. Reading διπλάσιον δὲ . . . εἰ ἄρα ἐστὶ ἡμίσεος διπλάσιον.
92. *Top*. 140b27–141a14.
93. Removing the obeli on ὅσων ἡ οὐσία . . . κατηγορουμένων.
94. *Met*. 1030b28–1031a1.
95. 181b25–182a6.
96. 165b20–21.

masculine. For a person who says [*mênin*] *oulomenên*[97] ["destroying anger": feminine] commits a solecism, according to him, though he does not appear to others to do so, while one who says [*mênin*] *oulomenon* [masculine] appears to do so, but does not. It is clear, then, that someone could also produce this effect by craft. That is why many arguments appear to deduce a solecism, when they do not really do so, just as in the case of refutations.

Pretty much all apparent solecisms depend on *tode* ("this"), that is,[98] when the inflection indicates neither a masculine nor a feminine but a neuter. For *houtos* ("he") signifies a masculine, *hautê* ("she") a feminine, while *touto* ("it"), though supposed to signify a neuter, often signifies either a masculine or a feminine. For example, "What is it (*touto*)?" "Calliope" [feminine], "A log" [neuter], or "Coriscus" [masculine].

In the masculine and feminine the inflections are all different, while in the neuter some are and some are not. Often, then, when *tode* ("this")[99] has been granted, people deduce as if *touton* ("him") had been said, and likewise substitute one inflection for another. The fallacy comes about because *touto* is common to several inflections; for it signifies sometimes *houtos* ("he" [nominative masculine]) and sometimes *touton* ("him" [accusative masculine]). And it should signify them alternately: when combined with *esti* ("is") it should be *houtos*, while with *einai* ("be" [infinitive]), it should be *touton*—for example, *esti Koriskos* ("it is Coriscus" [nominative]) and *einai Koriskon* ("to be Coriscus" [accusative]). And in the case of feminine nouns it should be the same way, and in that of what are called "object words" that have masculine or feminine designations. For only those that end in *–on* have the [neuter] designation that belongs to objects—for example, *xulon* ("log"), *schoinion* ("rope"). Those that are not like that are masculine or feminine, and some of these we apply to objects—for example, *askos* ("wine-skin") is a masculine noun and *klinê* ("couch") a feminine one. That is why indeed in cases of this sort one with *esti* and one with *einai* will differ in parallel ways.

Also, solecism resembles in a certain way those refutations that are said to depend on similar names for dissimilar things. For just as there we meet solecism in the case of the things at issue, so here we meet it in the case of names; for human and white are both names and things.[100]

It is evident, then, that we must try to deduce a solecism on the basis of the inflections just mentioned.

These, then, are the forms of competitive arguments and the parts of their kinds, and the ways of employing them are the ones mentioned. But it makes no small difference whether the things having to do with the questioning are arranged in a certain way with a view to concealment, just as in the case of dialectical ones.[101] Next in order, then, after what has been said, first this must be discussed.

97. As Homer does in *Iliad* 1.1.
98. Reading τὸ τόδε and rejecting the seclusion of καὶ.
99. Reading τόδε.
100. I.e., where similar names designate dissimilar things. See $166^{b}16$–18.
101. *Top*. $155^{b}26$–28.

15
How to Question Effectively

With a view to refutation, one thing is length; for it is difficult to take a comprehensive view of many things at the same time. And to produce length the elements [or topics] that have been mentioned[102] must be used. One is speed; for when people are left behind, they see less far ahead. Further, there is anger and rivalry; for when people are agitated, they are all less capable of being on their guard. Elements [or topics] for [provoking] anger are those making it evident that one wishes to act unjustly and be altogether shameless. Further, putting one's questions alternately, whether one has several arguments related to the same point or arguments that something is so and that it is not so; for the result is that the answerer is made to be on his guard either against several or against contrary arguments at the same time.

In general, all the things useful for concealment that were mentioned before are also useful against competitive arguments; for concealment is for the sake of escaping detection, and escaping detection for the sake of deception.

Against those who refuse anything they think to be in favor of the argument, one must put the question negatively, as if wishing for the contrary of what one wishes, or, at any rate, putting the question impartially; for people haggle less when it is not clear what one wishes to obtain.

Also, in the case of particulars, when someone grants a particular one, often one must not, having done the induction,[103] make the universal the subject of one's question, but rather use it as if it has been granted; for sometimes people themselves even think[104] that they have granted it, and appear to their listeners to have done so, because they remember the induction, and suppose that the questions would not have been asked pointlessly. And in those cases[105] in which the universal is signified not by a name but by a similarity [between the particulars], one must use that to one's advantage; for a similarity often goes unnoticed.

Also, to obtain a premise, one must get contrary answers side by side. For example, if one wishes to obtain that one should obey one's father in everything, one must ask, "Should one obey one's parents in everything, or disobey them in everything?" And ask, "Must one concede that many times many is many or few?" For then, if he had to choose, he would more believe it to be many: for the putting of contraries side by side makes them appear smaller or larger, worse or better, to people.

But often the most blatant of sophistical quibbles on the part of questioners produces an intense impression of refutation, when, not having deduced anything, they

102. *Top*. 157a1–5.
103. Reading ἐπαγαγόντα.
104. Reading οἴονται καὶ αὐτοὶ.
105. *Top*. 157a21–33.

do not make the last thing a question, but state it as a conclusion, as if they had deduced it: "Therefore, so-and-so is not the case."

It is also sophistical, when what is proposed is unacceptable, to demand to be answered with what appears to be so, having initially proposed what seems to be so, putting questions in some such way as this: "Does it seem to you to be so that . . . ?" For if the question is one of the things from which the deduction proceeds, either a refutation or something unacceptable must come about: if he grants it, it will be a refutation; if he does not grant it, and even denies that it seems to be so, it will be unacceptable; and if he does not grant it, but agrees that it seems to be so, it will be refutation-like.

Further, as in rhetorical arguments,[106] so in the same way in refutatory ones one must look for things that are contrary either to the things the answerer says himself or to those that he agrees speak or act well, further, to those that seem to be of this sort or to those similar to them, whether to most people or to all.

Also, just as answerers, at any rate,[107] when they are being refuted, produce an equivocation if their refutation is going to come about, so questioners too must sometimes make use of this against objectors: taken in this way it follows, but taken in that one it does not—and the answerer has assumed it in the latter—as Cleophon does in the *Mandrobulus*.[108]

Questioners who have been hindered in the argument must cut off the rest of their attacks, while an answerer, if he perceives this beforehand, must put in his objection before it happens and forestall it.[109]

And one must sometimes make one's attack against things other than the stated one, having taken the latter in that sense, if one does not have an attack against the one proposed, just as Lycophron did when it was proposed that he deliver an encomium for a lyre.[110]

Against those who demand [an explanation of] what one is making one's attack against (since it seems one must assign the cause, yet some ways of stating it make the defense too easy), one should say (what is the universal result in refutations), "a contradiction" (that is, denying what one has affirmed, and affirming what one has denied[111]), and not that of contraries the science is the same or not the same.

And one must not ask for one's conclusion as a premise, while some premises must not be asked at all, but treated as agreed to.

106. *Rh*. 1398b21–25.

107. Reading γε.

108. Perhaps not a reference to the Athenian tragic poet, mentioned at *Po*. 1448a12 and 1458a20, but rather to a character of the same name in the *Mandrobulus* of Xenocrates (T1 Tarán).

109. I.e., questioners whose argument is being thwarted by the answerer should give up whatever remains of it before its failure becomes apparent. The answerer, on the other hand, wants to prevent this, since he is winning.

110. *Rh*. 1401a15–16.

111. Reading ἀποφῆσαι . . . φῆσαι.

16
How to Answer Effectively

175ª1 What questions are based on and in what way they must be asked in competitive discussions have now been stated. Next we must speak about answering, about how and what one must provide a resolution of, and for what purpose arguments of this sort are beneficial.

They are useful for philosophy because of two things. For, in the first place, as they depend for the most part on speech, they make us better equipped with regard to how many ways a given thing is said of things, and what sorts of things apply in the same way or in distinct ways both to the things at issue and to their names. Second, they are useful for inquiries of one's own; for a person who easily succumbs to fallacious reasoning due to someone else, and who does not perceive it,[112] will often succumb to it even when it is due to himself. Third, and last, there is a further one relating to reputation: seeming to be trained in everything and not inexperienced in anything; for if someone who is taking part in arguments finds fault with arguments, without having anything determinate to say about their badness, it creates a suspicion that he seems to be making difficulties not due to the truth of the matter but due to inexperience.

How answerers should reply to arguments of this sort is evident, if indeed we have correctly stated previously what fallacies are based on,[113] and those in which the getting of answers has more [of an upper hand][114] have been adequately described. But to take hold of an argument and see and resolve the defect in it is not the same thing as being able to reply to it quickly when one is asked a question; for what we know, we are often ignorant of in a changed context. Further, just as in other areas greater speed or slowness comes about on the basis of training, so it is too in the case of arguments. So, even if something may be clear to us, if we are untrained, we come to it too late for the opportune moment.

And sometimes the same thing happens as with geometrical diagrams;[115] for there, even when we have analyzed, we sometimes cannot reconstruct; so too in refutations we know what the connected thing is that the argument depends on, but are puzzled as to how to resolve the argument.

17
Acceptable Resolutions versus True Ones

First, then, just as we say that we must sometimes deliberately choose to deduce acceptably rather than truthfully, so too we must sometimes provide a resolution

112. Reading μὴ αἰσθανόμενος.
113. Chapters 4–12.
114. Chapters 12–15.
115. *NE* 1112ᵇ20–24.

acceptably rather than in accord with the truth. For, in general, we must fight against contentious arguers not as against refuters but as against apparent refuters; for we say that they are not really deducing, so that it is with a view to their not seeming to do so that one must correct them. For if a refutation is a non-homonymous contradiction based on certain things, there should be no need to draw distinctions against ambiguity and homonymy; for they do not produce a deduction. But there is nothing else for the sake of which one must draw a distinction ahead of time except that the conclusion appears refutation-like.

One must, then, beware not of being refuted, but of seeming to be, since the asking of ambiguous questions, ones depending on homonymy, and all other such ways of cheating, obscure even a true refutation and make it unclear who is refuted and who is not. For since it is possible at the end, when the conclusion is reached, to say that the questioner has not denied precisely what one has affirmed, but rather[116] has done so homonymously, even if it mostly happened to refer to the same thing, it is unclear whether one has been refuted; for it is now unclear[117] whether he is speaking the truth. If, on the other hand, one had drawn a distinction and questioned about the homonymous or ambiguous expression, the refutation would not have been unclear. Also, the thing contentious arguers additionally seek, though less so nowadays and more so previously, that the person being questioned must answer either "yes" or "no," would have come about. But nowadays, because those getting answers ask their questions incorrectly, the person being questioned is compelled to add something to his answer, by way of rectifying the defect in the premise; since if adequate distinctions are drawn, the answerer is compelled to say either "yes" or "no."

If someone will suppose that an argument turning on homonymy is a refutation,[118] it will not be possible for the answerer to avoid being refuted in a certain way; for in the case of visible things, it is necessary to deny about the name what one has affirmed, and affirm what one has denied. For the way in which some people produce a rectification is of no benefit. For they say not that Coriscus is musical and unmusical, but that *this* Coriscus is musical and that *this* Coriscus is unmusical. For the account [of] *this* musical (or unmusical) Coriscus will be the same as [of] Coriscus, [giving] precisely what one is affirming as well as denying at the same time. But perhaps it does not signify the same thing (for neither did the name there), so what is the difference? But if in one case he is going to assign the simple expression "Coriscus," and in another he is going to add "a certain" or "this" to it, it is absurd; for the addition belongs no more in one than in another; for it makes no difference to whichever of the two he adds.

Nonetheless, since if one does not draw distinctions in a case of ambiguity it is unclear whether a person has been refuted or not, and since it is allowed in arguments

116. Rejecting the addition of ἢ.
117. *Top*. 160ª23–32.
118. Rejecting the addition of ἔλεγχον.

to draw distinctions in them, it is evident that not to draw these distinctions, but to grant the question unconditionally, is an error, so that even if the person himself does not seem to have been refuted, at any rate, his argument is similar to a refuted one. It often happens, however, that though people see the ambiguity, they hesitate to draw the distinction, because of the great frequency with which people propose things of this sort, in order not to seem to be making difficulties in response to everything. Then, though they would never have thought that the argument would depend on this, they are often confronted with something unacceptable. So, since one is allowed to draw distinctions, one must not hesitate to do so, as was said previously.[119]

If a person had not made two questions into one, a fallacy depending on homonymy or ambiguity would not have come about either, but rather a refutation or not a refutation. For what is the difference between asking whether Callias and Themistocles are musical or whether two distinct people with one name are? For if one name indicates more things than one, one has asked more questions than one. If, then, it is not correct to demand to obtain one simple answer to two questions, it is evident that it is not fitting to give a simple answer to any homonymous question, even if it is true of all the things [asked about], as some people claim it is. For it is no different from asking whether Coriscus and Callias are at home or not at home, when either they are both there or both not there; for in both cases there are several premises involved; for it is not if the answer is true that the question is one question. For it is also possible, when asked countless distinct questions, for it to be true to say simply "yes" or "no." Nonetheless, one must not answer them with one answer; for this does away with dialectical argument. And it is the same way if indeed distinct things have the same name applied to them. If, then, one must not give one answer to two questions, it is evident that in the case of homonymous questions one must not say either "yes" or "no"; for the speaker has not given an answer [if he does], though he has spoken. But among practitioners of dialectic this is what is in a way demanded, because of neglecting to consider the result.

As we said, then, since there are some seeming refutations that are not really such, in the same way there are some seeming resolutions that are not really resolutions. And these, we say, are the very ones we must sometimes propose rather than the true ones in competitive arguments and in replying to equivocation. In the case of things that seem to be so, one must answer, "let it be so"; for then in fact there is the least likelihood that any refutation on a side issue[120] would come about. But if one is compelled to say something unacceptable, in that case especially one must add "it seems";[121] for in this way neither a refutation nor something unacceptable would seem to have come about.

119. *Top*. 160a17–34.
120. *Top*. 112a8.
121. 174b12–18.

Since it is clear how one asks for what was initially at issue,[122] and people think that they must at all costs do away with things that lie close to [the conclusion], and that some things must not be conceded (on the supposition that the questioner is asking for what was initially at issue), so when someone demands something of such a sort as to necessarily follow from the posit, but is either[123] false or unacceptable, we must say the same thing; for the necessary consequences seem to belong to the posit itself.

Further, when the universal has not been obtained by a name but by a comparison, say that the questioner obtained it neither as granted nor as he proposed it; for a refutation often depends on this too.

If one is prevented from using these, one must go for the conclusion's not having been correctly proved, replying in accord with the division already stated.[124]

When names are used in their strict senses, one must answer either simply or by drawing a distinction. It is when we posit things by supplying the sense in thought—for example, when a question is not asked perspicuously but in a docked way—that a refutation comes about that depends on it. For example: "Is whatever is of the Athenians a possession of the Athenians?" "Yes." "And it is the same way in other cases too?" ["Yes."] "Then, is man of the animals?" "Yes." "Therefore, man is a possession of the animals." [But this is an error.] For we say that man is of the animals because he is an animal, just as we say that Lysander is of the Spartans because he is a Spartan. It is clear, then, that where what is proposed is not perspicuous, one must not concede it in a simple way.

When it seems that of two things that are so, if one of the two is so, of necessity the second is so, while if the second is so, the first is not of necessity so, then, when one is asked which of the two is so, one must grant the weaker (for to produce a deduction based on more things is more difficult). But if the questioner tries to prove that one thing has a contrary, while the other does not, if his argument is true, we must say each has a contrary, but that no name is established for the second one.[125]

About some of the things they say, ordinary people would maintain that anyone who did not concede them was speaking falsely, while about others they would not say it, for example, about those where they have no belief either way (for to ordinary people the question of whether the soul of living things can pass away or is immortal is not something that has been determined). In those cases, then, in which it is unclear in which of two ways what is proposed is usually stated, whether in the way maxims are (for people call both true beliefs and general affirmations "maxims") or in the way "the diagonal is incommensurable" is, where there is no belief either way about the truth, one would most of all go unnoticed in changing the names where these are concerned. For because it is unclear on which side the truth lies, one will not

122. *Top*. 162^{b}34–163^{a}13.
123. Reading ἢ.
124. 168^{a}17–169^{a}21.
125. The questioner will then be forced to show that there is no similarity to unify the nameless class, which is very difficult to do. Cf. *Top.* 157^{a}21–33.

seem to be playing the sophist, and because there being no belief either way, one will not seem to be stating a falsehood; for the change will make the argument irrefutable.

Further, whenever one foresees any question, one must formulate one's objection beforehand and state it ahead of time; for in this way one would most hinder the one putting the questions.

18
Correct Resolutions

Since a correct resolution consists in bringing to light a false deduction, showing what sort of question its falsity depends on, and since something is said to be a false deduction in two ways (for it is one either if a falsehood has been deduced or if what is not a deduction appears to be a deduction), there must be both the resolution mentioned just now and also the rectification of the apparent deduction, showing which of the questions its appearing so depends on.[126] So the result is that one resolves arguments that are genuine deductions by doing away with something, while one resolves apparent ones by drawing distinctions.

Again, since some arguments that really deduce have a true conclusion, while others have a false one, it is possible to resolve those that are false with respect to their conclusion in two ways: either by doing away with one of the questions or by proving that the conclusion does not hold in the relevant way. Those, on the other hand, that are false with respect to their premises can be resolved only by doing away with one of the questions; for the conclusion is true.

So those who wish to resolve an argument must in the first place look to see whether it has proceeded deductively or is non-deductive, and next whether the conclusion is true or false, in order to resolve it either by drawing distinctions or by doing away with [one of the questions], that is, doing away with it either in the one way or in the other, as previously stated.[127]

There is the greatest possible difference between resolving an argument when one is being questioned and when not; for in the former case it is difficult to foresee it, while to see it when at one's leisure is easier.

19
Arguments Depending on Homonymy and Ambiguity

Among the refutations that depend on homonymy and ambiguity, some involve a question that signifies several things, while others have a conclusion that is said in many ways—for example, in the case of "speaking pertaining to the

126. Reading παρὰ τί.
127. 176ᵇ36–177ᵃ2.

silent,"[128] the conclusion is equivocal, and in the case of "not scientifically knowing what one scientifically knows,"[129] one of the questions involves an ambiguity. Also, what is equivocal is sometimes so and sometimes not so—or rather, its being equivocal signifies that it is in one sense so and in another sense not so.

When what is said in many ways appears at the end, no refutation comes about, unless the questioner also obtains the contradiction—as, for example, in the case of "seeing pertaining to the blind"; for without the contradiction there was no refutation.[130] When, on the other hand, what is said in many ways is in the questions, it is not necessary to deny the equivocal thing beforehand; for the argument is not directed at it but is due to it.

Initially, then, one must reply both to a name and to a statement that is equivocal[131] in the following way, saying that in one way it is so and in another way it is not so—for example, that[132] "speaking pertaining to the silent" is possible in one way, but in another not, and that "one needs must do the things that needs must be," is so of some things but not so of others; for things are said to "needs must be" in many ways. But if one failed to notice the equivocation, one must rectify it at the end by adding to the questioning: "Is speaking pertaining to the silent possible?" "No, but speaking pertaining to this person when he is silent is." Similarly, when arguments have what is said in many ways in the premises: "Don't people scientifically know what they scientifically know?" "Yes, but not those who know scientifically in the relevant way." For that it is not possible to scientifically know what one scientifically knows, and that it is not for those who scientifically know in the relevant way, are not the same thing.[133] And, in general, even if the questioner deduces in a simple [or non-equivocal] way, one must contend that what he has denied is not the thing he affirmed but its name, so that there is no refutation.

128. 166ᵃ12–14.

129. 177ᵃ26–30.

130. "Is there seeing pertaining to the blind?" "No." "Wasn't Homer blind?" "Yes." "But people could see him, couldn't they?" "Yes." "So there is seeing pertaining to the blind." The conclusion is not a refutation because it is open to the answerer to say that it was not in that sense that he took the first question when he answered "No." To get a refutation the questioner must also get an answer to the question in its second sense, in which it means "Do blind people see?" The contradictory of an ambiguous statement, in other words, is the contradictory of each of its disambiguated versions.

131. Omitting πρὸς.

132. Reading τὸ.

133. We cannot, when asleep, have *active* scientific knowledge of the things we have *potential* scientific knowledge of, but we can have it when awake.

20
Arguments Depending on Composition and Division

It is evident too how fallacies that depend on division and composition must be resolved; for if the statement signifies something distinct when it is divided and when
35 it is combined, one must state the contrary of what leads to the conclusion. And all arguments of the following sort depend on composition and division: "Was what you saw so-and-so being beaten with what he was beaten with?" and "Was what he was being beaten with what you saw him being beaten with?"[134]

This, then, also has something of ambiguous questions, but it depends on com-
177b1 bination. For what depends on division is not equivocal (for the statement is not the same when divided), if indeed ὄρος and ὅρος, when pronounced in accord with the accentuation, did not signify a distinct thing.[135] In writing, indeed, a name
5 is the same when it is written in the same letters and in like manner (and even there people now add distinguishing marks), but spoken names are not thereby the same. So that what depends on division is not equivocal. And it is evident too that not all refutations depend on equivocation, as some people say.

10 It is for the answerer, then, to make the division; for I saw a man "being beaten with my eyes" is not the same as "I saw with my eyes" a man being beaten. Also, there is Euthydemus' argument, "Do you know now in Sicily that there are triremes in Piraeus?"[136] And again, "Can a person who is good be a cobbler who is bad? Then
15 there could be a bad cobbler who is good. So he will be a good bad cobbler." Again, "Are things of which the sciences are excellent, excellent ones to learn? But the science of what is evil is excellent. Therefore, what is evil is an excellent thing to learn. But surely evil is both evil and a thing to learn, so that evil is an evil thing to learn. But the science of evil things is excellent." "Is it true to say now that you were born?

134. Composition: the answer is (e.g.) "Yes. I saw him being beaten with a stick." Division: the answer is "No. I saw him with my eyes being beaten with a stick."

135. Rejecting the addition of ὡς and seclusion of καὶ. Before the introduction of breathing marks the word pronounced ὄρος (*oros*: smooth breathing) was a homograph of the word ὅρος (*horos*: rough breathing). Nonetheless, it did not signify a distinct thing, since in speech it is divided, with *oros* meaning "mountain" and *horos* meaning "defining mark" or "boundary marker," and neither of these is equivocal. See 169a27–29.

136. If the things involved in the Piraeus example are a trireme, the relation of being (located) in, and the Piraeus, the fallacy consists in arguing from knowing the parts to knowing their combination. What this omits—as in the case of knowing the word because of knowing the letters—is the order of the parts. If a person is in the Piraeus, what he knows he knows in the Piraeus. He knows that there is a trireme (somewhere). But we cannot infer that he knows that there is a trireme (located) in the Piraeus, only that he (located) in the Piraeus knows that there is a trireme (somewhere). In our text the argument is as follows: You are in Sicily now, so that what you know you know there now. One thing you know is that triremes are in Piraeus (sometimes). Those are illegitimately combined to yield the false conclusion. See *Rh*. 1401a26–33.

Therefore, you were born now." Or does it signify something distinct when divided? For it is true to say now that you were born, but not that you were born now.

"Can you do what you are capable of doing in the way you are capable of it? But when you are not playing the lyre, you are capable of playing it. Therefore, you can play the lyre while not playing it." But he does not have the capacity for this, "to play the lyre while not playing it," but rather, when he is not doing it, to do it.

But some people also resolve this in another way. For if the answerer has granted that a person can do it in the way he is capable of doing it, they say that it does not follow that he plays the lyre while not playing the lyre; for it has not been granted that he will do it in every way in which he is capable of doing it, and it is not the same thing to do something in some way in which one is capable and in every way in which one is capable. But it is evident that they do not resolve it correctly; for the resolution of arguments that depend on the same thing is the same, while this resolution will not fit all cases asked[137] for in every way, but is against the questioner, not against the argument.[138]

21
Arguments Depending on Accentuation

There are no arguments, either written or oral, that depend on accentuation except for certain ones, few in number, that might be produced—for example, the following argument: "A house is where (*hou*) you lodge, isn't it?" "Yes." "But isn't 'you do not (*ou*) lodge' the negation of 'you lodge'?" "Yes." "But you said that where you lodge is a house. Therefore, a house is a negation." How, then, this is to be resolved is clear. **178ᵃ1** For *ou* does not signify the same thing when pronounced with a more acute and with a more grave accent.[139]

22
Arguments Depending on Things Said in the Same Way That Are Not the Same

It is also clear how one should respond to arguments depending on things said in the same way that are not the same, if indeed we possess the kinds of predication.[140] For one person has granted, when asked, that something signifying a what-it-is does not belong [to a subject], while another has proved that something signifying a relative

137. Reading ἐρωτωμένους.
138. Since the argument could be rephrased so as to avoid this resolution of it.
139. 166ᵇ3–6.
140. I.e., the categories.

or a quality, but which seems to signify a what-it-is because of speech, does belong [to a subject].

For example, in the following argument: "Is it possible to be doing and have done the same thing at the same time?" "No." "But it is surely possible to be seeing and to have seen the same thing at the same time and in the same respect." [Or in this one:] "Is any being done to a doing?" "No." "Aren't 'is cut (*temnetai*),' 'is burned (*kaietai*),' and 'is affected by a perceptual object (*aisthenetai*)' said of things in the same way, and don't they signify a being done to? Again, 'saying (*legein*),' 'running (*trechein*),' and 'seeing (*horan*)' are said of things in a similar way to each other. But surely seeing (*horan*) is being affected by a perceptual object (*aisthanesthai*), so that it is both a being done to and a doing at the same time."

But if, in the first example, having granted that it is not possible to be doing and have done the same thing, a person were to say that it is possible to be seeing a thing and to have seen it, he has not yet been refuted, if he would not say that seeing is a sort of doing, but rather of being done to; for this question is required in addition, though he is supposed by the listener to have granted it when he granted that cutting (*temnein*) is a doing and having cut (*tetmêkenai*) a having done, and so on with others that are said of things in a similar way; for the listener himself adds the rest, on the supposition that it [seeing] is said in a similar way. But it is not said of things in a similar way, though it appears to be, because of speech. And precisely the same thing happens as in cases of homonymy; for in cases of homonymy a person ignorant of arguments thinks that he has denied the thing he stated, not the name. But an additional question still needs to be asked, whether he said the homonym looking to that one thing; for if he has granted things in this way, there will be a refutation.

The following arguments too are similar to the preceding ones: "If what a person has, he later does not have, he has lost it. For a person who has lost only one dice will not have ten dice." Or is it rather that although what a person does not have and had before, he has lost, it is not necessary for him to have lost as much or as many things as he does not have?[141] Having asked, then, about what he has, he draws [a conclusion] about how many he has; for ten is a how many. If,[142] then, he had asked initially whether "someone not having as many things as he had before has lost that many," no one would have granted it, but would have said either "that many" or "some of them."

Also, the argument that one could give what one does not have; for he does not have one dice only. Rather, he has given, not what he has not got, but what he has not got in the way in which he has given it, as the [only] one he has. For "only" does not signify a this [something], a quality, or a quantity, but a certain relation to something else—for example, that it is not along with anything else. It is, then, as if[143] he

141. Reading ὅσον δὲ μὴ ἔχει ἢ ὅσα.
142. Rejecting the seclusion of εἰ.
143. Reading ὥσπερ οὖν.

had asked, "Could a person give what he does not have?" and, receiving the answer "No," were to ask whether a person could give something quickly that he does not have quickly, and, receiving the answer "Yes," were to deduce that he could give what he does not have. And it is evident that it has not been deduced; for to give quickly is not to give a this [something] but to give in a certain way, and a person could give something in a way that he has not got it—for example, having got it with pleasure, he would give it with pain. **178^{b}1**

Similar too are all the arguments of the following sort: "Could a person strike a blow with a hand he does not have?" or "Could someone see with an eye he does not have?" (For he does not have only one.)[144] Some people resolve it by saying that a person who has more than one eye (or whatever it is) also has only one.[145] Others resolve it as they also resolve, "What a person has, he received"; for this person gave only one vote; and "That person," they say, "has only one vote, received from him."[146] Other people do away with the question immediately, saying that one can have what one has not been given—for example, one can have been given sweet wine but, because of its having been destroyed in the process of transfer, have sour wine.

But, as was also said previously,[147] all these offer a resolution not against the argument but against the person [making it]. For if this was a resolution, if anyone granted the opposite [of what he did], it would be impossible to achieve a resolution, just as happens in other cases. For example, if "it is so in one way, but in another it is not" is the resolution, and the answerer granted it as said unconditionally, the conclusion has been reached. But if a conclusion is not reached, this could not be a[148] resolution. And in the cases mentioned, even if everything is granted, we say that no deduction comes about.

Further, the following also belong among arguments of this sort. "If something is written, did someone write it? But it is written now that you are sitting, which is a false statement, though it was true at the time it was written. Therefore, a statement at once false and true was written." [No,] for the truth or falsity of a statement or belief signifies not a this [something], but a quality; for the same account also applies in the case of a belief. Also, "What does a learner learn? Is it what he learns? But someone learns what is slow fast." It is not what he learns that is meant, therefore, but how he learns it. Also, "Does someone tread on what he takes a walk on? But he takes a walk on the whole day." Rather, it is not what he takes a walk on that is meant but when

144. (1) "Could a person see with an eye he does not have?" "No." (2) "Suppose he saw with both eyes. Then is it true that he did not see with the left one only?" "Yes." "And isn't it also true that he did not see with the right one only?" "Yes." (3) "Then, he must have seen with an eye he does not have, since the left and the right are the only eyes he has."

145. I.e., they treat "only" not as a way of having or possessing something but as a thing had, so that each thing had, regardless of how many there are, is an "only one."

146. "Could a person strike a blow with a hand he does not have, or see with an eye he does not have?" "Yes, because what he has, he has received, and he has not received either his hands or his eyes."

147. 177^{b}31–34.

148. Rejecting the addition of ἡ.

he takes a walk; nor when[149] he drinks a cup is the cup what he drinks but what he drinks from. Also, "Is it either by being taught or by discovering that a person knows what he knows? But if of two things he has been taught one and discovered the other, he has neither been taught nor discovered the two together." Rather, "what [he knows]" means "every individual thing," not "everything collectively."

Also, the argument that there is a third man beyond man-itself and the particular man; for "man" and everything common signifies not a this something but rather such-and-such a quality, quantity, relative, or something of this sort. It is the same way too in the case of Coriscus and musical Coriscus and whether they are the same or distinct. For the first signifies a this something, the second a quality, so that it is impossible for the latter to have been set-out. But it is not being set-out that produces the third man[150] but conceding that it is precisely a this something; for it is also not possible for precisely what is a man to be a this something, as Callias is. Nor will it make any difference if someone were to say that it is not precisely what is a this something that is being set-out but a quality; for there will still be a one over many, like man. It is evident, then, that it must not be granted that what is predicated as common to all is a this something, but that it signifies a quality, relative, quantity, or something else of this sort.

23
Arguments Depending on Speech

In general, in arguments depending on speech, the resolution will always be in accord with the opposite of what the argument depends on—for example, if the argument depends on composition, the resolution will be by division, if it depends on division, by composition. Again, if it depends on acute accentuation, grave accentuation will be the resolution, and if it depends on grave accentuation, acute accentuation. If it depends on homonymy, one can resolve it by saying the opposite name—for example, if [the argument] results in your saying that something is animate,[151] having denied that it is so, make clear in what way it is animate, while if one has said that it is inanimate, but it has been deduced that it is animate, say in what way it is inanimate. It is the same way too in the case of ambiguity. And if the argument depends on similarity of speech, the opposite will be the resolution. "Could one give what one does not have?" Surely not what one does not have, but rather in a way in which one does not have it—for example, one dice only.[152] "Does someone scientifically know what he scientifically knows by being taught or by discovery?"[153] [Yes,] but not the

149. Reading οὐδ' ὅταν.
150. F184, 83.34–85.12.
151. Reading ἔμψυχον.
152. 178ᵇ8–10.
153. 178ᵇ34–36.

things he scientifically knows. Also, whether a person treads on what he takes a walk on; [yes], but not the time. It is the same way too in the case of the others.

24
Arguments Depending on the Coincident

As for arguments depending on the coincident, there is one and the same resolution for all of them. For since it is indefinite at which time a predicate should be said of the thing at issue, when it belongs in the case of its coincident, and since on some occasions it seems and is said to belong, while on others it is said not necessarily to do so, one must, then, once the conclusion has been drawn, say against all of them alike that it does not necessarily belong. One must, however, have an example to put forward.

All arguments of the following sort depend on the coincident: "Do you know what I am going to ask you?" "Do you know the one who is approaching?" or "the one who has hidden his face?" "Is the statue a work of yours?" or "Is the dog your father?"[154] "Is the product of two small numbers a small number?" For it is evident in all these cases that it is not necessary for what is true of the coincident to be also true of the thing at issue; for it is only to things that are indistinguishable with respect to their substance and one, it seems, that all the same things belong; while in the case of something good[, for example,] being good and being what I am going to ask you about are not the same. Nor in the case of someone approaching is being the one who is approaching (or the one who has hidden his face) the same as being Coriscus. So, if **179b1** I know Coriscus but do not know the person approaching, I know and do not know the same person. Nor, again, if this is mine and also a work, is it a work of mine. Instead, it may be my possession, or thing, or something else. And it is the same way in the other cases too.

Some people resolve these by doing away[155] with the question. For they say that it is possible to know and not to know the same thing, but not in the same respect. When, then, they do not know the person approaching but do know Coriscus, they say that they do know and do not know the same thing, but not in the same respect. And yet, in the first place, as we have already said,[156] the rectification of arguments depending on the same thing must be the same. But this will not be so if one takes the same claim to apply not to knowing but to being or being in a certain state—for example, in "If this [dog] is a father and this [dog] is yours . . ."; for if this is true

154. Plato, *Euthydemus* 298e.
155. Reading ἀναιροῦντες.
156. 177b31–32.

in certain cases, that is, that it is possible to know and not to know the same thing, even so, what has been said about it has nothing in common with the latter case.[157]—

(There is nothing to prevent the same argument from having several defects, but not every bringing to light of a defect constitutes a resolution; for it is possible for a person to prove that something false has been deduced, but not to have proved what it depends on—for example, in the case of Zeno's argument that movement is impossible. So even if he were to try to infer an impossibility, in leading [the argument] to the impossible, he is making an error,[158] even if he has deduced it innumerable times. For this is not a resolution; for a resolution, as we just saw, is a bringing to light of what the falsehood of a false deduction depends on.)

—If, then, it has not been deduced, or in addition he tries to infer a truth or a falsehood,[159] the making clear of that is a resolution. Perhaps, indeed, there is nothing to prevent this from happening in some cases, albeit in the ones under consideration, at any rate, this would not seem to be so; for one knows both of Coriscus that he is Coriscus and of the thing approaching that it is approaching. But to know and not to know the same thing does seem to be possible—for example, one can know the pale thing and not know the musical one; for in this way one does know and does not know the same thing, but not in the same respect. But, as for the thing approaching and Coriscus, he knows both that it is approaching and that it is Coriscus.[160]

Those who resolve the argument that every number is small also err in a similar way to those we have mentioned; for if, when the conclusion has not been reached, they pass this over and say that the conclusion has been reached and is true (for every number is both large and small), they make an error.

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157. The resolution or rectification of the argument, (1) "This dog is a father. This dog is yours. Therefore, this dog is your father" ought to be the same as that of (2) "Do you know the one who is approaching?" since they exploit the same thing. But the suggested resolution of (2), that one can know and not know the same thing, but not in the same respect, does not apply to (1). So it is not a genuine resolution of (2).

158. Reading ἐπιχειροίη συνάγειν ὡς ἀδύνατον συνάγων εἰς ἀδύνατον, ἁμαρτάνει. The reference is to someone providing a putative resolution of an argument by producing a *reductio ad absurdum* argument against its conclusion, thereby proving the deduction false. Even if he succeeds, he will not have brought to light what the false deduction is false through, and so will not have provided a resolution of it, and so will have made an error.

159. Removing the obeli on ἢ καὶ ἀληθὲς ἢ ψεῦδος.

160. Rejecting the addition of ὅν. The principle underlying this initially opaque argument is this: "it is only to things that are indistinguishable with respect to their substance and one, it seems, that all the same things belong to" (179ᵃ37–39). So all the same things belong to Coriscus and to Coriscus, since he is indistinguishable from himself in substance or essence. "The thing approaching" is not a classically understood definite description but is functioning in the context as an indexical: *that* thing approaching. So that whatever is true of *it* is true of whatever is indistinguishable from it with respect to its substance or essence. But it is—one and the same thing as—Coriscus, so everything true of it is true of Coriscus and vice versa. But it is true of the thing approaching that one knows it is approaching, so it is true of Coriscus that one knows that he is approaching.

Some people also resolve the deductions by appeal to equivocation—for example, by saying that what is "yours" is a father, son, or slave. And yet it is evident that if the appearance of refutation depends on what is said of things in many ways, the name **180^{a}1**
or the statement must be said literally of several things. No one says that B is literally A's child if A is the child's master; rather, the composition depends on what is coincidental. "Is B yours?" "Yes." "Is B a child?" "Yes." "Then B is your child" (because he 5
is coincidentally both yours and a child). But he is not your child.[161]

There is also the argument that being something of evils is good. "For practical wisdom is scientific knowledge of evils." But being this of these is not said of things in many ways, but is said of a possession. If, however, it is said of things in many ways (for we say that man is of the animals, though not a possession of theirs, and 10
if the relation of so-and-so to evils is said as its being of them, because of this it is a so-and-so of evils; but it is not one of the evils), it appears to depend on what is in a certain respect and unconditionally.

And yet it is perhaps possible for something of evils to be equivocally good, although not in the case of this argument, but rather if one were to say a slave is 15
good of the wretched.[162] But perhaps it is not even this way here; for if something is good and of someone, it is not at the same time good of someone. Nor is the expression "man is of the animals" said in many ways; for if we sometimes signify something elliptically, this is said in many ways; for in fact by quoting the half-line, 20
"Sing, goddess, the wrath,"[163] we signify "recite me the *Iliad*."

25
Arguments Depending on Strict and Unconditional versus in Some Respect

Arguments that depend on what is said to be this in the strict sense, or else in some respect, place, way, or relation to something, and not unconditionally, must be resolved by looking at the conclusion in relation to its contradictory, to see whether it can possibly be qualified in any of these ways. For it is impossible for contraries and 25
opposites, or an affirmative and a negative, to belong unconditionally to the same thing. However, there is nothing to prevent each from belonging in some respect, relation, or way, or one in some respect and the other unconditionally. So, if this one belongs unconditionally and this other one belongs in a certain respect, there is as yet no refutation; and this is something one must look at in the conclusion in relation to its contradictory. 30

161. Reading ὅτι συμβέβηκεν εἶναι καὶ σὸν καὶ τέκνον. ἀλλ' οὐ σὸν τέκνον.
162. As in, "the best of a bad lot."
163. The opening words of Homer's *Iliad*.

All arguments of this sort involve the following: "Is it possible that what is not is? But surely it is, at any rate, something that is not." Similarly, what is will not be; for it will not be one of the beings. "Is it possible for the same person at the same time to be a keeper and a breaker of his oath?" "Is it possible for the same person at the same time to obey and disobey the same order?" Or rather is it not that being something and being unconditionally are not the same (for it is not the case that if what is not is something, it also is unconditionally)?[164] Nor if a person keeps his oath on this or in this respect is he necessarily also [unconditionally] a keeper of oaths (and a person who swears[165] that he will break his oath, has, in breaking it, kept this one only, but is not [unconditionally] a keeper of oaths). Nor does he who disobeys obey
180b1 [unconditionally], but rather he obeys in this.[166]

The argument is similar too about whether it is possible for the same person to lie and at the same time be truthful. But because it is not easy to see whether[167] one should assign the "unconditionally" to "be truthful" or to "lie," it appears difficult [to resolve]. However, there is nothing to prevent the same person[168] from being unconditionally a liar but truthful in a certain respect or in relation to a certain thing, that is, truthful in some things, though not himself truthful.

It is the same way too in cases of being in relation to some thing, place, or time; for all the arguments of this sort depend on the following: "Is health, or wealth, a good? But to a person without practical wisdom who uses it incorrectly, it is not good. Therefore, it is good and not good." "Is being healthy, or having power in the city, good?[169] But sometimes it is not better [than other things]. Therefore, the same thing is good and not good for the same person." Or is there nothing to prevent something from being unconditionally good but not good for a particular person, or good for a particular person, but not good now or not here? "What a practically wise person would not wish for, is it bad? But he does not wish to get rid of the good. Therefore, the good is bad." No, for it is not the same thing to say that the good is bad and that to get rid of the good is bad. And it is the same way too with the argument about the thief; for it is not the case that if a thief is bad, taking is bad too. Therefore, he does not wish for the bad, but the good; for taking a good thing is good.[170] Also, disease is bad, but not to get rid of disease.

164. *Met.* 1030a25–26, *Rh.* 1402a3–7.
165. Reading ὁ δ'.
166. "Is it possible for the same person at the same time to obey and disobey the same order?" "No." "But the order was to disobey the order."
167. Reading ποτέρως.
168. Reading τὸν αὐτὸν.
169. Reading ἀγαθόν.
170. Reading τὸ γὰρ λαβεῖν ἀγαθὸν ἀγαθόν. The argument, since it must be similar to the previous one, is something like this: A thief is bad. Therefore, what he does (namely, taking) is bad. No, because what he wishes for, in taking, is something good, and taking a good thing is good.

"Is what is just more choiceworthy than what is unjust and what is justly done than what is unjustly done? But it is more choiceworthy to be put to death unjustly." "Is it just for each to have his own? But whatever things someone has judged in accord with his own belief, even if false, have the controlling votes in the eyes of the law. Therefore, the same thing is just and not just." Also, "Should judgment be in favor of those who state just things or those who state unjust things? But surely it is just for a person who suffers injustice to state fully the things he has suffered; and these were unjust ones." [These are fallacies.] For if to suffer something unjustly is more choiceworthy, it does not follow that unjustly is more choiceworthy than justly. On the contrary, unconditionally, justly is more choiceworthy, although there is nothing to prevent unjustly from being more so than justly in this case. Also, to have what is one's own is just,[171] while to have what is another's is not just, yet there is nothing to prevent this judgment from being just—for example, when it is in accord with the one who is doing the judging; for if it is just in this case[172] or in this way, it does not follow that it is also unconditionally just. Similarly too when things are unjust, there is nothing to prevent saying them, at any rate, from being just; for if saying them is just, it does not necessarily follow that they are just, any more than if it is beneficial to say things, they are beneficial. And it is the same way in the case of just ones too. So, if the things said are unjust, it does not follow that the person who says unjust things prevails;[173] for he says things that are just to say, but that are unconditionally unjust, that is, unjust to suffer.

26
Arguments Depending on the Definition of a Refutation

Arguments depending on the definition of a refutation must be replied to, as suggested previously,[174] by looking at the conclusion in relation to its contradictory, and seeing in what way it will involve the same thing, in the same respect, in relation to the same thing, in the same way, and at the same time. And if this additional question has been asked initially, one must not agree that it is impossible for the same thing to be double and not double, but state that it is possible, only not in such a way as was agreed to be a refutation. All the following arguments depend on this sort of thing. "Does a person who knows that a given thing is the given thing it is, know the thing? And the same for a person who does not know it? But one who knows that Coriscus is Coriscus might not know that he is musical, so that he both scientifically knows and does not know the same thing." "Is what is four cubits long greater than what is three cubits long? But what is three cubits long might become four cubits long. But

171. *Rh.* 1366^{b}9–11.
172. Reading τοδὶ.
173. Reading νικᾷ.
174. 167^{a}21–27, 180^{a}24–25.

what is greater is greater than the lesser. Therefore, the thing in question is greater and less than itself in the same respect."

27
Arguments Depending on Asking for What Was Initially at Issue

As for arguments that depend on asking for and obtaining what was initially at issue, if this is clear, one must, when asked, not grant it, even if it is acceptable, while stating the truth.[175] If, on the other hand, it is concealed, one must, because of the defectiveness of such arguments, turn the charge of ignorance back on the questioner, saying that he is not arguing dialectically; for a refutation must do without what was initially at issue. Next, one must say that it was granted on the supposition that it would not be used [as a premise], but used to produce a deduction against it, the contrary way to that in the case of refutations on side issues.

28
Arguments Depending on Affirming the Consequent

Also, those arguments that infer by means of [affirming] the consequent must be exposed in the course of the argument itself. For the logical sequence of consequents[176] is twofold; for it is either as the universal follows [in a logical sequence of consequents] the particular, for example, as animal follows from human (for it is claimed that if this accompanies that, that accompanies this), or else in accord with opposition (for [it is claimed that] if this follows that, the opposite of the one follows the opposite of the other). It is on this too that the argument of Melissus[177] depends; for [he claims that] if what has come to be has a starting-point, what has not come to be does not have one, so that if the heaven[178] has not come to be, it is also unlimited. But this is not so; for the logical sequence is the reverse.

29
Arguments Depending on an Addition

One must look at any arguments where the deduction depends on an addition to see whether, when it is subtracted, the impossibility follows nonetheless.[179] And one

175. Reading λέγοντα. I.e., one must state that it begs the question. See 176ᵃ27–31.
176. See *Int.* 19ᵇ19–22, *Top.* 113ᵇ15–26.
177. See 167ᵇ13–20.
178. I.e., the universe. See *Cael.* 278ᵇ11–21.
179. 167ᵇ21–36.

must next bring this to light, and say that one had granted it not as something one believed, but for the purposes of the argument, while the questioner has made no use of it for the purposes of the argument.

30
Arguments Depending on Making Many Questions into One

Against arguments that make many questions into one, one must draw a distinction right at the start; for a question is one to which there is one answer, so that one must not affirm or deny several things of one thing or one thing of several things, but one thing of one thing. But just as in the case of homonyms,[180] where a homonym **181b1** sometimes belongs to both or to neither, so that, though the question is not simple, nothing results to affect those who give a simple answer, so it is too in these cases. When, then, the several predicates belong to one thing, or the one predicate to several things, no contradiction results for those who give a simple answer and have made this error, but rather when something belongs to one and not to another thing, or several things are affirmed of several. And there is a way in which both belong to both, while in another way again they do not, so one must beware of this. For example, in these arguments: "If one thing is good and another is bad, it is true to say that these things are good and bad, and again that they are neither good nor bad (for each of the two is not each of the two), so that the same thing is both good and bad and neither good nor bad." Also, "If each thing is the same as itself and distinct from another thing, since[181] these things are not the same as other things, but as themselves, and also distinct from themselves, the same things are both distinct from themselves and the same as themselves." Further, "If the good becomes bad and the bad good, they would become both." Also,[182] "Of two unequal things, each is equal to itself, so that they themselves are equal and unequal to themselves."

These arguments also fall into the province of other resolutions; for "both" and "all" signify several things;[183] therefore, it does not follow that one has affirmed and denied the same thing, except in name. And this, as we saw,[184] is not a refutation. On the contrary, it is evident that if several things do not give rise[185] to one question, but rather one predicate is affirmed or denied of one thing, there will not be [a deduction of] an impossibility.

180. *Top*. $148^{b}4$–9.
181. Reading ἐπεὶ δ'.
182. Reading τε.
183. *Pol*. $1261^{b}16$–32.
184. $167^{a}23$–25, $168^{a}28$–33, $177^{a}30$–32.
185. Reading γινομένων.

31
Arguments Depending on Babbling

Where arguments leading one to say the same thing several times are concerned, it is evident that one must not grant that predicates said as relatives signify something when in separation by themselves—for example, "double" without[186] "double of half," just because it appears in it. For "ten"[187] is also in "ten minus one," "do" in "not do," and, in general, the affirmation in the negation. Nonetheless, if one says, "this is not white," one is not saying that it is white. Perhaps "double" does not signify anything at all, any more than in the case of half.[188] But even if "double" does signify something, it is not the same thing as when it has been brought together [with its correlate]. Nor does "scientific knowledge" in a form of it (for example, if it is "medical scientific knowledge") signify precisely what the common thing is, which, as we saw,[189] is scientific knowledge of the scientifically knowable.

In the case of things that are predicated of the things through which they are indicated, one must say that they are not the same separately as in the account indicating them. For "concave" indicates the same common thing in the case of the snub and the bandy, but when added, in the one case to "nose" and in the other to "leg," there is nothing to prevent it from signifying distinct ones; for in the first case it signifies
182ᵃ1 snub and in the second bandy, and it makes no difference whether one says "snub nose" or "concave nose."

Further, one must not grant the expression in the nominative; for that is false; for the snub is not snub nose [nominative] but something—for example, an affection—characteristic of a nose [genitive], so that there is nothing absurd in supposing that a snub nose is one having the concavity characteristic of a nose.

32
Arguments Depending on Solecisms

Where solecisms are concerned, we said previously what their appearing to follow depends on.[190] How they must be resolved will be evident from the arguments themselves; for all of the following sort wish to establish a solecism: "Is this (*ho*$_{\text{n. nom.}}$) truly what you truly state it (*touto*$_{\text{n. acc}}$) to be? But you say something is a stone (*lithon*$_{\text{m. acc.}}$). Therefore, something is a stone (*lithon*) [nom. is required]." On the contrary, in

186. Reading ἄνευ.
187. Reading τὰ.
188. Reading τὸ ἐν τῷ ἡμίσει.
189. *Cat.* 11ᵃ24–32, *Top.* 108ᵃ9.
190. 173ᵇ17–174ᵃ11. In what follows, genders and cases are indicated by suffixes with the usual abbreviations: m. (masculine), f. (feminine), n. (neuter), nom. (nominative), acc. (accusative), gen. (genitive).

speaking of a "stone", one says not "he (*ho*$_{\text{n. nom.}}$)" but "him (*hon*$_{\text{m. acc.}}$)," and not "this (*touto*$_{\text{n. nom.}}$)" but "this (*touton*$_{\text{m. acc.}}$)." If, then, one were to ask, "Is it this (*touton*) [*houtos*$_{\text{m. nom.}}$ is required] him (*hon*$_{\text{m. acc.}}$) you truly say?" one would not seem to be speaking correct Greek, any more than if one were to ask, "Is it he (*houtos*$_{\text{m. nom.}}$) her (*hên*$_{\text{f. acc.}}$) [m. is required] one says he is?" But to say "wood (*xulon*$_{\text{n. acc.}}$)" for "he," or whatever signifies neither something feminine nor something masculine, makes no difference. That is why no solecism comes about if you say, "Is this (*ho*$_{\text{n. nom.}}$) what you say it (*touto*$_{\text{n. nom.}}$) is? You say it is wood (*xulon*$_{\text{n. acc.}}$). Therefore, it is wood (*xulon*$_{\text{n.}}$)." "Stone," on the other hand, and "he" (*houtos*) have masculine denomination.[191] If, then, one were to ask, "Can he (*houtos*) be a she (*hautê*)?" or, again, "Is he (*houtos*) not Coriscus?" and then were to say, "Therefore, he (*houtos*) is a she (*hautê*)," one has not derived a solecism, not even if "Coriscus" signifies precisely a she (*hautê*), because the answerer does not grant this. Instead, this point must be asked as an additional question. But if this is not the case nor does the answerer grant it, then the solecism has not been deduced either in reality or in relation to the one who was questioned.

Similarly, then, in the first example too "he (*houtos*)" must signify the stone. If, however, this is neither so nor is granted, the conclusion must not be stated, although, by depending on the fact that the dissimilar case of the name appears to be similar, it appears to follow.

"Is it true to say that this (*hautê*$_{\text{f. nom.}}$) is just what you said this (*autên*$_{\text{f. acc.}}$) is? You said it is a shield (*aspida*$_{\text{f. acc.}}$); therefore, it is a shield (*aspida*) [nom. is required]." On the contrary, this is not necessary if "this (*hautê*$_{\text{nom.}}$)" signifies not a shield (*aspida*$_{\text{acc.}}$) but a shield (*aspis*$_{\text{nom.}}$), while "this (*tautên*$_{\text{acc.}}$)" signifies a shield (*aspida*$_{\text{acc.}}$).

Nor is it necessary, if he (*houtos*$_{\text{m. nom.}}$) is who you say he (*touton*$_{\text{m. acc.}}$) is, and you say he is Cleon (*Kleôna*$_{\text{acc.}}$), is he (*houtos*$_{\text{nom.}}$) therefore Cleon (*Kleôna*$_{\text{acc.}}$); for he (*houtos*$_{\text{nom.}}$) is not *Kleôna*$_{\text{acc.}}$ [but rather *Kleôn*$_{\text{nom.}}$]; for what was said was that he (*houtos*$_{\text{nom.}}$), not him (*touton*$_{\text{acc.}}$), is who you say he is; for it would not be correct Greek either if the question had been asked in the latter way ["Is him who you say he is?"].

"Do you scientifically know this (*touto*)? This (*touto*) is a stone (*lithos*$_{\text{nom.}}$). Therefore, you scientifically know a stone (*lithos*$_{\text{nom.}}$) [*lithon*$_{\text{acc.}}$ is required]." On the contrary, "this (*touto*)" does not signify the same thing in "do you scientifically know this (*touto*)?" and in "this (*touto*) is a stone," but rather in the first it signifies this (*touton*$_{\text{acc.}}$), and in the second this (*houtos*$_{\text{nom.}}$).

"When you have scientific knowledge of something (*hou*$_{\text{gen.}}$), do you scientifically know it (*touto*$_{\text{acc.}}$)? But you have scientific knowledge of a stone (*lithou*$_{\text{gen.}}$). Therefore, you scientifically know of a stone (*lithou*$_{\text{gen.}}$)." On the contrary, "of something (*hou*$_{\text{gen.}}$)" says "of a stone (*lithou*$_{\text{gen.}}$)," and "it (*touto*$_{\text{acc.}}$)" says a stone (*lithon*$_{\text{acc.}}$). And it was granted that when you have scientific knowledge of something (*hou*$_{\text{gen.}}$), you

191. Reading κλῆσιν.

182ᵇ1 scientifically know not of it (*toutou*$_{gen.}$) but it (*touto*$_{acc.}$), so that you scientifically know not of a stone (*lithou*$_{gen.}$) but a stone (*lithon*$_{acc.}$).

That arguments of this sort do not deduce a solecism, though they appear to do so, and why they appear to do so, and in what way one must reply to them, is evident from what has been said.

33
Simpleminded versus Incisive Arguments

We must also understand that, among all arguments, it is easier with some, more difficult with others, to see by depending on what, and at what point, they mislead the listener by arguing fallaciously—although the latter are sometimes the same arguments as the former; for one must call an argument "the same" that depends on the same thing. But the same argument might seem to some people to depend on speech, to others on the coincident, and to others on something else, because, when [the words in it are] changed, each is not then equally clear.

Just as in the case of those that depend on homonymy, then, which seems to be the most simpleminded mode among the fallacies, some are clear even to random people. (For pretty much all ridiculous arguments depend on speech. For example, "A man was carried down from a ladder by a chariot."[192] And "Where are you bound? To the yardarm." "Which of two cows will calve in front?[193] Neither; but both will calve in the rear." "Is Boreas pure? Certainly not; for he has killed the drunken beggar."[194] "Is he *Euarchos*? Certainly not. He is *Apollônidês*."[195] And it is the same way with pretty much the vast majority of the rest.) Others, however, apparently escape the notice of even the most experienced. A sign of this is that people often fight about the names, for example, about whether "being" and "one" always signify the same thing, or something distinct; for to some people "being" and "one" seem to signify the same thing in all cases, while others[196] resolve the argument of Zeno and of Parmenides by saying that being and one are said of things in many ways.

Similarly too, where the coincident and each of the others is concerned,[197] some of the arguments will be easier to see, others more difficult, and to grasp which kind they belong to, and whether one is a refutation or not a refutation, is not equally easy for all of them.

192. The double meaning of the sentence is obscure.
193. "In front" temporal vs. "in front" spatial.
194. Pure of guilt vs. pure in the sense of unadulterated or clean. Boreas, the North Wind, was thought to be a "clean" wind.
195. *Euarchos* means "rules (*archein*) well (*eu*)," while *Apollônidês* seems to derive from *apollunai*, which means "to destroy utterly," "kill."
196. Including Aristotle himself. See *Met.* 1018ᵃ35–36.
197. Reading καὶ περὶ τὸ συμβεβηκὸς καὶ περὶ τῶν ἄλλων.

An incisive argument is one that makes one most puzzled; for it bites most deeply. A puzzle is twofold: one occurs in dialectical arguments that are deductive, when one is in doubt as to which of the questions asked one must do away with; the other occurs in contentious arguments,[198] about how one is to state what has been proposed. That is precisely why, among deductive ones, the more incisive arguments make one inquire more.

A deductive argument is most incisive when from the things that seem most of all to be so it does away with the most acceptable belief; for though it is a single argument, it will, when the contradiction is converted,[199] contain deductions that are all similar in character; for it will always, on the basis of acceptable beliefs, do away with one that is equally acceptable, which is precisely why it is necessary to be puzzled.[200] **183^{a}1** This sort of argument, then, is most incisive, namely, one which puts the conclusion on an equal footing with the questions, while the one based on those that are on a similar footing is second; for this will produce similar puzzlement as to which of the questions must be done away with. But this is difficult; for one must do away with something, but what to do away with is unclear.

The most incisive of contentious arguments, on the other hand, is in the first place one where it is not immediately clear whether [the conclusion] has been deduced or not, that is, whether the resolution depends on a falsehood or on drawing a distinction; second among the others is where it is clear that it depends on drawing a distinction or doing away with something, but it is not evident which of the questions it is that, by doing away with it or drawing distinctions in it, one is to resolve it, but [only] whether[201] it depends on the conclusion or on one of the questions.

Sometimes, an argument that does not deduce is simpleminded, if the premises are too unacceptable or false; but sometimes it does not deserve to be despised. For when one of the questions is omitted of the sort that the argument is about and which it is due to, the deduction that has both not obtained this in addition[202] and not deduced [the conclusion] is simpleminded. But when what is omitted is

198. Chapter 17.

199. *APr*. 59^{b}1–5.

200. Start with (A): (1) All mothers love their children (very acceptable belief); (2) Medea was a mother (fact or very acceptable belief); therefore, (3) Medea loved her children (false). Then, taking the contradiction of (3), (3*) Medea did not love her children, construct two other deductions in which it is used in a changed position with each of (1) and (2) to subvert the other, as follows: (B) All mothers love their children; (3*) Medea did not love her children; therefore, Medea was not a mother. (C) (3*) Medea did not love her children; Medea was a mother; therefore, some mothers do not love their children. (A), (B), and (C) are similar in character, in that each subverts an acceptable belief by means of a conclusion based on acceptable beliefs. This produces a maximum of puzzlement because each of (1), (2), and (3) has had its contradiction shown to be also acceptable.

201. Reading ἀλλὰ πότερον.

202. Reading περὶ οὗ ὁ λόγος καὶ δι’ ὃ, καὶ μὴ προσλαβὼν τοῦτο.

something extraneous, it is by no means to be lightly despised; rather, the argument is decent, though the questioner has not asked his questions[203] correctly.

Also,[204] just as it is sometimes possible to propose a resolution in relation to the argument, sometimes in relation to the questioner and his mode of questioning, and sometimes in relation to neither of these, so too it is possible to question and deduce in relation to the posit, in relation to the answerer, and in relation to the time (when the resolution needs more time than[205] the present opportunity allows for dialectical argument leading to the[206] resolution).

34
Originality of the Study

As for how many and what sorts of things the fallacies that come about among dialectical interlocutors are based on, and how we are to prove the opponent to be saying something false and how to make him say something unacceptable, further, on what basis a solecism[207] comes about, how to ask questions, and what the arrangement of questions is, and, further, what all arguments of this sort are useful for, and about simply answering questions, both in general and as regards how to resolve arguments and solecisms,[208] let the foregoing be what we have to say. It remains to recollect our proposal at the start, say a few words about it, and bring our discussion to an end.

What we deliberately chose to do,[209] then, was to discover a certain capacity to argue deductively about the thing put before us on the basis of the things that are taken to be the most acceptable ones; for this is the work of dialectic itself and of the
183b1 examinational craft. But since there is provided along with it, because of its proximity to sophistry, not only the capacity of examining dialectically,[210] but also with a pretense of knowledge, because of this, we proposed for our study not only the work we just mentioned of being capable of getting hold of the relevant argument, but also, when submitting to argument, of defending our posit in the same manner through the most acceptable beliefs. And the cause of this we have stated, since this is also why Socrates used to ask questions and not answer them; for he used to acknowledge that he did not know.[211]

203. Reading ἠρώτησεν.
204. Reading τε.
205. Reading ἢ.
206. Reading τὸ.
207. Reading σολοικισμός.
208. Reading σολοικισμούς.
209. *Top*. 100a18–21.
210. Reading προκατασκευάζεται . . . ὥς οὐ μόνον πεῖραν δύναται. . . .
211. E.g., Plato, *Euthyphro* 5a, *Hippias Minor* 369d–e, *Republic* 337e–338a.

It has been made clear in the preceding discussion how many things this capacity will be related to and on how many it will be based,[212] and from what sources we will become well equipped with these, further, how questions must be asked and questioning generally arranged, and about the answers and resolutions related to deductions. And all the other issues have also been made clear that concern the same methodical inquiry about arguments. In addition, we have discussed fallacies in detail, as we have already stated previously.[213]

It is evident, then, that what was proposed has been adequately brought to an end. We must not overlook what has happened where this study is concerned. For in the case of all discoveries, those due to the previous labors of other people have been taken up and advanced bit by bit by those who took them up afterward, while original discoveries usually make progress that is small at first but is surely much more useful than what later develops from them; for perhaps the start is the most important thing of all, as the saying goes. That is why it is also the most difficult; for to the extent that it is greatest in capacity, it is smallest in magnitude and most difficult to see. But once it is discovered, it is easier to add to it and develop the rest in connection with it, which is precisely what has also in fact happened where rhetorical arguments are concerned, and also where pretty much all the other crafts are concerned. For those who discovered the starting-points advanced them in only a small way, while the ones who enjoy a good reputation nowadays are the heirs (so to speak) of a long series of predecessors who advanced it bit by bit, and in this way have developed it—Tisias coming after the first ones, Thrasymachus after Tisias, Theodorus after Thrasymachus, while numerous others have contributed numerous parts. That is why it is no wonder that the craft has a certain magnitude.

Of this study of ours, by contrast, it is not the case that part of it had been worked out before, while part had not. On the contrary, nothing existed at all. For in fact the education given by the paid teachers of contentious arguments was similar to the system of Gorgias; for while the one lot used to give [sets of] rhetorical arguments to learn by heart, the others gave arguments based on questions, into which questioner and answerer each thought that the arguments of both of them most often fell. That is precisely why the teaching they gave their students was rapid but un-craftlike; for they supposed that they could educate by imparting not the craft but its products, as if a person promising to impart a science dealing with having no pain in the feet were then to teach not the craft of shoemaking, or even from whom one will be able to be provided with such things, but were to provide numerous kinds of shoes of every variety; for he has helped supply one's need, but has not imparted a craft.

212. The reference, as at $183^{a}38$, is to the categories of predicates, and the premises or propositions constructible from them, discussed in *Top*. 1.4–9.
213. $183^{a}27$–28.

Also, where rhetorical arguments are concerned there were many things said long
184b1 ago, while about deductive argument we had absolutely nothing else earlier to speak of at all,[214] but were for a long time laboring and inquiring by knack.[215]

If, then, having gotten a theoretical grasp on it, it appears to us,[216] such being the situation as it existed at the start, that our methodical inquiry is adequate when compared with other studies that have developed on the basis of what has been handed
5 down, there remains for all of us, or rather for you,[217] the ones who listen to it, the work of showing sympathetic consideration for the shortcomings of our methodical inquiry and much gratitude for our discoveries.

214. Reading πρότερον ἄλλο λέγειν ἀλλ᾽ ἢ.
215. Plato, *Phaedrus* 260e, *Gorgias* 463b.
216. Reading ἡμῖν.
217. Reading ἡμῶν ἢ.

PHYSICS*

BOOK 1

1.1
Scope and Method of Natural Science

Since in all methodical inquiries that have starting-points, causes, or elements, knowledge—that is, scientific knowledge—comes from knowledge of these (for we think that we know each thing once we know its primary causes and primary starting-points, all the way to its elements), it is clear that in the scientific knowledge of nature our first task must be to try to determine the things that concern the starting-points.

And the natural route is from things that are known and more perspicuous to us to things that are more perspicuous and better known by nature; for it is not the same things that are known to us and known unconditionally. That is why we must in this way advance from things that are less perspicuous by nature but more perspicuous to us to the things that are more perspicuous by nature and better known.

And the things that are in the first instance clear and perspicuous to us are to a degree confused. It is only later, through a division of these, that we come to know their elements and starting-points. That is why we must proceed from the universals to the particulars; for it is the whole that is better known by perception, and the universal is a sort of whole; for the universal embraces many things as parts. The same thing happens in a way with names in relation to their account; for **184^{b}10** a name like "circle" signifies a sort of whole in an indeterminate way, while the definition divides it into its particular [elements]. And children at first suppose[1] all men to be their fathers and all women their mothers, only later coming to distinguish each of them.

* Translated by C. D. C. Reeve. Text: W. D. Ross, *Aristotelis Physica* (Oxford, 1950), in consultation with P. Pellegrin, *Aristote Physique* 3rd ed. (Paris, 2021). The Greek title is *Phusikês Akroaseôs* (*Lectures on Natural Science*).

1. Reading ὑπολαμβάνει.

1.2
Natural Science's Starting-Points; Parmenides and Melissus

There must, then, be either one starting-point or several, and, if one, it must be either immovable, as Parmenides and Melissus say, or in movement, as the natural scientists say, of whom some state air to be the primary starting-point, others water.[2] But if there are several, they must be either limited in number or unlimited, and, if limited, but more than one, then either two, three, four, or some other number, while if there are an unlimited number, then either they are, as Democritus held, one in kind but differing in shape or in form,[3] and they may also be contraries.

Those who inquire about how many beings there are inquire in a similar way; for they are inquiring about the primary things of which the beings are composed, as to whether they are one or many, and if many, whether limited or unlimited in number. So they are inquiring primarily[4] about whether the starting-point and the element are one or many.

To investigate whether being is one and immovable is not to make an investigation concerning nature; for just as a geometer has no further argument against someone who does away with the starting-points [of geometry]—since this is a matter for another science[5] or one that is common to all[6]—so it is too in the case of starting-points [related to nature]; for there will no longer be a starting-point if being is one thing only, and one in this way. For a starting-point must be a starting-point of some thing or things.

To investigate, then, whether being is one in this way is like dialectically discussing any other thesis that is stated for the sake of argument, like that of Heraclitus,[7] or (if anyone were to state it) that being is one human being, or like refuting a contentious argument—which is precisely what the arguments of Melissus and Parmenides involve; for in fact they assume falsehoods and argue invalidly—or rather, the argument of Melissus[8] is crude and involves no puzzle. Grant him one absurdity and the others follow—nothing difficult in this.

As for ourselves, we must assume that the things that are by nature are in movement, either all of them or some of them. And this is clear from induction. At the same time, we should not resolve every [contentious argument] at hand, but those that involve false demonstration from the starting-points, and not those that do not.

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2. Air: Anaximenes of Miletus, Diogenes of Apollonia (*Met*. 984a5–7); water: Thales of Miletus (*Met*. 983b18–27), Hippo (984a3).
3. Reading σχήματι δὲ ἢ εἴδει διαφερούσας.
4. Reading πρῶτον.
5. *Met*. 1025b4–16.
6. *Top*. 101a34–b4.
7. Because "all perceptibles are always flowing" (*Met*. 987a33–34), they are all both F and not-F, and so violate the principle of non-contradiction.
8. 1.3.

For example, it belongs to the geometer to refute a quadrature by means of segments, but to refute one like Antiphon's does not belong to a geometer. Nonetheless, since Melissus and Parmenides happen to speak about nature, although the puzzles they state are not natural scientific ones,[9] perhaps it would be good to discuss them briefly; for the investigation involves philosophy.

The starting-point that is most proper of all [to such an investigation], since something is said to *be* in many ways, is to see in what way[10] those who maintain that all things are one say it. Do they mean that all are substance, or quantities, or qualities? And, again, do they mean that all are one substance—for example, one human being or one horse or one soul? Or quality, and that it is one—for example, pale, or hot, or something else of that sort? For these are all very different and all impossible to maintain. For if there is to be both substance and quality and quantity, then whether these are detached from each other or not, the beings will be many. If, on the other hand, everything is quality or quantity, then, whether substances exist or not, something strange results—if the impossible should be said to be [merely] strange! For none of the others is separable or beyond substance; for all of them are said of an underlying subject—the substance.

Melissus says that being is unlimited. Therefore, being is some quantity; for the unlimited is in [the category of] quantity, while a substance, quality, or affection cannot be unlimited except coincidentally, that is, if they were at the same time also quantities; for the account of the unlimited[11] makes use of quantity, but not of substance, or of quality either. If, then, there is substance and quantity as well, being is two, and not one. And if there is substance only, it is not unlimited, nor does it have any magnitude at all; for [if it did,] some quantity will have to exist.

Further, since things are said to be *one* in many ways, just as they are said to *be*, we must investigate in what way they maintain that the universe is one. Things are said to be one if they are continuous, or indivisible, or if the account of their essence is one and the same, like *methu* and *oinos*.[12]

Therefore, if continuous [is the relevant way of being one], then being[13] is many; for the continuous is divisible without limit.

There is, however, a puzzle about part and whole—although not perhaps relevant to the argument, but an intrinsic one—as to whether part and whole are one or several, and in what way one or several, and if several, in what way several. (And [the same puzzle arises] about parts that are not continuous.) Also, if each of two parts is one with the whole, as being indivisible from it, [there is the puzzle] that they will also be one with each other.

9. Reading περὶ φύσεως μὲν, οὐ φυσικὰς δὲ ἀπορίας.
10. Reading ἰδεῖν πῶς.
11. *Met.* $1066^{a}35$–$^{b}5$.
12. Terms for wine.
13. Reading πολλὰ τὸ ὄν.

But then if it is as being indivisible [that things are said to be one], then in nothing at all will there be a quality or a quantity, nor will being be unlimited, as Melissus says, or limited, as Parmenides does; for it is limits that are indivisible, not limited things.

But then if all beings are one in account, like clothing and apparel, then it follows that they are stating the Heraclitean argument;[14] for the being for good and for bad, for good and for not good, will be the same, so that to be good and to be not good, to be human and to be horse, will be the same, and their argument will be, not that all beings are one, but that they are nothing at all—and the being for such-and-such quality and for such-and-such quantity will be the same.

Even the more recent of the ancient thinkers were causing a disturbance lest the same thing should turn out to be both one and many at the same time. That is why some of them, like Lycophron, did away with the "is," while others remodeled the language, and said not "the human is pale" but "the human has paled," and not "the human is walking" but "the human walks," lest by adding "is" they would make the one be many—as if things were said to *be* or to be one in only one way. The beings, however, are many, either in account (for example, being for pale is distinct from being for musical, although the same thing may be both, and the one therefore many) or by division, like the whole and its parts. And at this point they were already involved in puzzles and agreeing that the one is many—as if it were not possible for the same thing to be both one and many, provided that these are not opposites; for a thing can be one either potentially or actually.

1.3
Refutation of Parmenides and Melissus

If we approach the thesis in this way, then, it appears to be impossible for the beings to be one. Also, the arguments on the basis of which these thinkers [try to] prove it are not difficult to refute. For both of them—both Melissus and Parmenides—contentiously deduce it.[15]

It is clear, indeed, that Melissus argues fallaciously;[16] for he thinks that if he has as an assumption that whatever comes to be has a starting-point, he also has that whatever has not come to be does not have one. Next, this also is absurd: to assume that in all cases there is a starting-point of the thing, not [merely] of the time, and not [merely] of unconditional coming to be, but of alteration as well—as if change never comes about all at once. Next, why is the universe immovable, if it is one? For if a part of it that is one—for example, this water here—can be moving within itself,

14. 185a7.
15. Omitting the repeat of 185a9–12.
16. *SE* 167b13–20.

why can't the universe also be moving within itself? Next, why should there be no such thing as alteration?

Moreover, being cannot be one in form either, except in the sense of what it is composed of (even some of the natural scientists speak of it as one in this, but not in the former, way); for human is distinct in form from horse, and contraries from each other.

And against Parmenides the ways of arguing—besides any that may be special to him—are the same. In fact, the resolution [of his argument] is in part that it is false and in part that it does not follow. It is false to the extent that he assumes that things are said to *be* in a simple way, while they are said to *be* in many ways. As for what does not follow, suppose that there are only pale things and that pale signifies one thing, nonetheless the pale things will be many and not one; for the pale will not be one by being continuous, nor by being one in account. For the being for pale will be distinct from the being for its recipient. And there will not be anything beyond the pale that is separable; for they are not distinct by being separable but because the being for pale and for what it belongs to are distinct. But this Parmenides did not get far enough to see.[17]

He must assume, then, not only that being signifies one thing, whatever it is predicated of, but also that it signifies precisely being and precisely one. For a coincident is said of some underlying subject, so that the thing of which being is a coincident will not be (for it is distinct from being); therefore, there will be something that is not. Precisely what is being, then, could not belong to something else. For it would not be possible for it to be a being, unless being signifies more than one thing, such that each is a sort of being. But it was assumed that being signifies one thing.

If, on the other hand, what is precisely being is not a coincident of other things, but other things are coincidents of it, why does precisely being signify being rather than not being? For suppose that what is precisely being will also be pale, but the being for pale is not precisely being (for even being cannot be a coincident of pale; for what is not precisely being will not be), then the pale will not be—and not in the sense of not being something-or-other, but of not being anything at all. Therefore, what is precisely being will not be; for it is true to say that it is pale, but this signified not being.[18] So even pale signifies precisely being. Therefore, being signifies more than one thing.

Therefore, being will not have magnitude either, if indeed being is precisely being; for the being of each of the two components would be distinct.

That what is precisely being is divided into another thing that is precisely being is evident even from the [definition of an] account. For example, suppose the human is

17. *Met.* $987^{b}32–33$, $1078^{b}25$.

18. (1) Pale ≠ what is precisely being, since it is a coincident of it. (2) The being for pale ≠ what is precisely being. (3) Being = what is precisely being (explicit at $186^{b}13$). (4) The being for pale ≠ being. (5) The pale is not (a being). (6) Precisely what is being is pale. (7) Precisely what is being is not (a being).

something that is precisely being, then the animal is also something precisely being, as is the two-footed. For if they are not something that is precisely being, they will be coincidents, either present in the human or in some other subject. But this is impossible; for something is said to be a coincident either if it is such that it can belong or not belong [to that subject], or if that to which the coincident belongs is present in the account of it (for example, being seated is a coincident as separable, while in the [account of the] snub[19] the account of the nose with which we say the snub is coincident belongs). Further, whatever is present in the definitional account of something, or of which the account is composed, must be such that in the account of it the account of the whole thing is not present—for example, in the two-footed that of the human, or in the pale that of the pale human. Therefore, if this is the way things are, and if the two-footed is a coincident of the human, then either it must be separable from the human, so that it would be possible for the human not to be two-footed, or else the account of the human would be present in the account of the two-footed. But this is impossible; for the latter is present in the account of the former.

If, on the other hand, the two-footed and the animal are coincidents of something else, and if each of them is not precisely a sort of being, then the human too would be a coincident of something else. But we must take it that what is precisely being is not a coincident of anything at all, and that if both of two things are said of something, that which they compose must be said of it as well. Therefore, the universe will be composed of indivisibles.

Some thinkers did, in fact, give in to both arguments: to the argument that all things will be one if being signified one thing, when they posited that not being exists; and to the argument from the division into two things, when they posited indivisible magnitudes.[20]

But it is evident that it is not true that if being signifies one thing, and not at the same time the contradictory of this, then not being will not exist; for nothing prevents not being from not being something, but [only] from simply not being. And it is absurd to say that if nothing else exists beyond being itself, then all things will be one. For who [can] get to know being itself except by knowing that what is precisely

19. *Met.* 1025ᵇ30–34.

20. (1) What is precisely being = the human (186ᵇ15–16). Hence (2) we cannot take the human to be a coincident of something else X, since then it would not be identical to X, and there would be more than one being, what is precisely being and X. But the human = the animal + the two-footed. So if the human were a coincident of X, then (3) the animal and the two-footed would also be coincidents of X. So these have the same status as the human and as what is precisely being, and so are distinct beings. If they do not have definitional accounts, we can stop there, since they will be indivisibles. If they do have definitional accounts, eventually these too must bottom out in indivisibles. Hence what is precisely being will eventually bottom out in as many indivisible beings as its definitional account makes reference to when fully spelled out. But the universe = what is precisely being (185ᵇ7). Hence (4) the universe will be composed of indivisibles.

being is something? And if that is so, there is nothing to prevent beings from being many, as was stated.

That it is impossible for being to be one in the way claimed, then, is clear.

1.4
The Views of the Natural Scientists

The natural scientists, on the other hand, state things in two ways. Some make being,[21] what underlies, one body—either one of the three or something else[22] that is denser than fire and rarer than air—and then generate the other things, making them many by means of condensation and rarefaction. These are contraries, which taken universally are excess and deficiency,[23] as are the great and the small in Plato,[24] except that he makes these be matter, and the one be form, while they make the underlying one be matter and the contraries be differences, that is, forms.

Others say that the contrarieties are present in the one and are segregated out of it—for example, Anaximander speaks like this, as do those, such as Empedocles and Anaxagoras, who say that the beings[25] are one and many; for they too segregate out the others from the mixture. They differ from each other, however, in that Empedocles posits a cycle of mixings and segregations, while Anaxagoras posits that it happened once, and Anaxagoras posits an unlimited number both of uniform things and of contraries, while Empedocles posits the so-called elements only.

Anaxagoras seems to think that these are unlimited in this way because he accepted as true the common belief of the natural scientists that nothing comes to be from not being (for it is because of this that they say that "all things were together" and that he makes the coming to be of such-and-such a sort of thing an alteration, while they make it aggregation and disaggregation).

Further, there is the fact that contraries come to be from each other. Therefore, they must have been there from the start; for if everything that comes to be must do so either from beings or from non-beings, and if it is impossible for it to come to be from non-beings (and in this belief all those concerned with nature are agreed), they regarded the remaining alternative as immediately following by necessity, that things come to be from beings that are already present but that, because of the smallness of their volume, from beings that are imperceptible to us.

That is why they say that everything has been mixed together in everything: because they saw everything coming to be from everything. But things appear different from one another, and are called by distinct names, depending on what is **187^{b}1**

21. Reading ὂν.
22. It is unclear who held this view, also mentioned at *GC* $328^{b}35$, $332^{a}21$, *Met.* $988^{a}30–31$.
23. *Met.* $1042^{b}31–35$.
24. $209^{b}33–210^{a}2$.
25. Reading τὰ ὄντα.

numerically predominant throughout the mixture of the unlimited particles; for they say that no whole thing is purely pale, dark, sweet, flesh, or bone, but whichever it has most of is what seems to be the nature of the thing.

If the unlimited, insofar as it is unlimited, is unknowable,[26] then the unlimited in number or with respect to magnitude is an unknowable quantity, and the unlimited in form is an unknowable quality. If, then, the starting-points are unlimited both in number and in form, it is impossible to know what results from them. For we think we have got hold of knowledge of a composite when we know the things it is composed of and what their quantity is.

Further, if it is necessary for a thing, of which a part can be of any size whatever in the direction of greatness and of smallness, to be itself capable of being so (by "parts" I mean components present in the whole into which the whole is divided), and if, on the other hand,[27] it is impossible for an animal or a plant to be of any size whatever, in the direction of greatness and of smallness, then it is evident that none of its parts can be either; for [if they could,] so likewise could the whole. But flesh and bone and things of that sort are parts of an animal, and fruits are parts of plants. It is clear, therefore, that it is impossible for flesh or bone or any other such thing to be of any size whatever, either in the direction of greatness or in the direction of smallness.

Further, if all such things are already present in each other, and do not come to be but instead, being present within, are segregated out; and if they are called [what they are] after whatever there is more of; and if anything can come to be from anything (for example, if water can be segregated out from flesh, and flesh from water); and if every limited body is done away with by [subtracting] some limited body: it is evident that it is not possible for everything to be present in everything. For if flesh is subtracted from water, and if this is done again by segregation from what remains, even if the flesh subtracted is always smaller, nonetheless it will not be smaller than a certain magnitude. So if the process of segregation comes to a stop, not everything will be present in everything (for there will be no flesh in the remaining water); but if it does not come to a stop, but subtraction is always possible, there will be an unlimited number of equal limited parts in a limited magnitude. But this is impossible.

In addition to these considerations, if every body from which something is subtracted must become smaller, and if flesh is definite in quantity, both in greatness and in smallness, it is evident that from the smallest possible quantity of flesh no body can be segregated out; for otherwise there will be a quantity of it smaller than the smallest possible one.

Further, in each of the unlimited bodies there would be already present unlimited flesh, blood, and brain, not indeed separated from each other, but beings nonetheless, and each unlimited. But this is unreasonable.

26. *Met.* 994b21–31.
27. Reading δὲ.

The statement that segregation will never [be complete] is not made on the basis of knowledge, but it is correct; for affections are inseparable. If, then, colors and states were mixed together, if they got segregated out, there would be a pale or a healthy that is not another thing, and is not predicated of a subject either. So [Anaxagoras'] *nous* is absurd, since it is seeking impossible things, if indeed it wishes to separate them, although it is impossible to do this, both with respect to quantity and with respect to quality: with respect to quantity, because there is no smallest magnitude; with respect to quality, because affections are inseparable.

Nor is Anaxagoras correct even about the coming to be of things of the same form. For there is a way in which clay is divided into clays, and a way in which it is not.

Moreover, the way in which bricks come from a house and a house from bricks is not the same as the way in which water and air are and come from each other. Also it is better to assume a smaller number of starting-points, that is, a limited number, precisely as Empedocles does.

1.5
The Starting-Points Are Contraries

All thinkers, then, posit contraries as starting-points, both those who say that the universe is one and not moving (for in fact Parmenides posits hot and cold as starting-points, though he calls[28] them by the names "fire" and "earth") and those who make use of the rare and the dense. Also, Democritus, who posits plenum and void (saying that the one is present as being, the other as not being), but further posits position, shape, and order. And these are kinds of contraries—for example, of position, up and down, in front and behind; of shape, angular and angle-less, straight and curved.

It is clear, then, that all in some way posit contraries as starting-points. And this is reasonable; for the starting-points must come neither from each other nor from other things, and all things must come from them. And to the first contraries these features belong: because they are first, they do not come from other things, and because they are contraries, they do not come from each other.

But how this conclusion follows must also be investigated by appeal to argument. Let us first take it, then, that no being whatever is by nature such as to do or suffer any random thing due to any random thing, nor does anything come to be from just anything, except if one takes a coincidental case; for how could pale come to be from musical, unless musical were coincident with the not pale or with the dark? Instead, pale comes from not pale—and not from any not pale but from dark, or something intermediate between the two. And musical comes to be from not musical—except **$188^{b}1$**

28. B8 DK.

not from any not musical but from unmusical, or something intermediate between the two, if there is such.

Nor again do things pass away into the first random thing—for example, the pale does not pass away into the musical, except sometimes coincidentally, but into the not pale, and not into any random one but into the dark or the intermediate. Similarly, the musical passes away into the not musical, and not into any random one but into the unmusical or into some intermediate, if there is such.

It is also the same in all other cases, since the same account also holds of the beings that are not simple but composite. But because the opposite dispositions have no names, its taking place escapes notice. For in all cases the harmonious must come to be from the unharmonious and the unharmonious from the harmonious, and the harmonious must pass away into the unharmonious, and not into any random one but into the opposite one. And it makes no difference whether we speak of harmony, order, or composition; for it is evident that the account is the same. Moreover, a house too, and a statue, and any other such thing whatever comes to be in the same way; for the house comes to be from the non-combination, or rather division, of these things in this way,[29] and the statue, or anything else that is shaped, comes to be from shapelessness. And each of these things is, on the one hand, an order, and, on the other hand, a sort of composition.[30]

Therefore, if this is true, everything that comes to be comes to be from, and everything that passes away passes away into, its opposite or an intermediate. But the intermediates are [composed] of contraries—for example, colors from black and white.[31] So all the things that come to be by nature are either contraries or [composed] of contraries.

Up to this point most of the others pretty much followed along with us, as we said previously;[32] for they all posit the elements and the things they call "starting-points" as contraries, even if they do so without argument, as if compelled by the truth itself. But they differ among themselves in that some take contraries that are prior, some contraries that are posterior, some contraries that are better known by reason, others that are better known by perception; for some posit hot and cold as the causes of coming to be, others wet and dry, others odd and even or strife and love, and these differ from each other in the way just stated.

So the starting-points they stated are in one way the same, in another way distinct—distinct in the way that most people believe; the same insofar as they are analogous; for they are taken from the same column of contraries,[33] some of which encompass [others], while others are encompassed. In this way, then, they spoke of them as similarly and distinctly, better and worse, and some as better known by

29. *Met.* 1036b23–24, 1043a7–9.
30. I.e., a form or a matter-form compound.
31. *Met.* 10.7, *Sens.* 439b25–30.
32. 188a19–30.
33. *Met.* 986a22–26.

reason, as was said previously, others by perception (for the universal is known by reason, the particular by perception; reason is of the universal, while perception is of the particular)—for example, the great and the small are known by reason, the rare and the dense by perception.

It is evident, then, that starting-points must be contraries.

1.6
The Number of Starting-Points (1)

We must next say whether they are two, three, or more in number. For they cannot be one, because contraries are not one, and they cannot be unlimited, because [if they were,] being would not be scientifically knowable.[34] Moreover, in any one kind there is just one contrariety,[35] and substance is one specific kind, and because it is possible [to generate everything] from a limited number [of starting-points], it is better to do so from a limited number, like Empedocles, than from an unlimited one (for Empedocles thinks that he gives an account of all things just as Anaxagoras does from the unlimited ones). Further, some [pairs of] contraries are prior to others, and some come to be from others,[36] such as sweet and bitter, white and black, while the starting-points must remain always. It is clear from these considerations that they are neither one nor unlimited in number.

Since, then, the starting-points are limited in number, there is some reason not to make only two of them; for one might raise the puzzle as to how density could at all be by nature such as to affect rarity, or rarity density. And similarly for any other contrariety whatever; for it is not love that gathers strife together and makes something from it, nor does strife do so from love, but both affect a third distinct thing. And some thinkers assume more than one such thing from which they construct the nature of the beings.

And in addition to this, if no nature distinct from the contraries is assumed, one may also raise this further puzzle; for we never in fact see contraries constituting the substance of the beings, but what is a starting-point must not to be something that is said of an underlying subject. For if it is, there will be a starting-point of the starting-point; for the underlying subject is a starting-point, and seems to be prior to what is predicated of it. Further, we say[37] that substance is not contrary to substance. How, then, can substance come from what are not substances? Or how could what is not substance be prior to substance?

That is why, if someone considers both the former argument and this one to be true, he must, if he is going to preserve both, posit some third thing that underlies

34. 187ᵇ7–8.
35. *Met.* 10.4.
36. Reading ἐξ ἄλλων.
37. *Cat.* 3ᵇ24–27.

189ᵇ1 [the contraries], like the one spoken of by those who say that the universe is one nature, such as water or fire or what is intermediate between the two. What is intermediate seems more [of a starting-point]; for fire, earth, air, and water are already involved with contrarieties.[38] That is why indeed those who make the underlying subject something distinct from these—or the ones who of these elements make it air—make it so not without reason; for of these air has indeed the least perceptible differences, and after it, water. Yet all these thinkers give shape to this one thing by means of contraries, that is, by means of density and rarity and the more and the less. And these taken generally are clearly excess and deficiency, as was stated previously.[39] Indeed this belief too—that the one and excess and deficiency are starting-points of the beings—would seem to be an ancient one, except that it is not stated in the same way. The ancient thinkers made excess and deficiency do the affecting and the one be affected, while some of the more recent ones stated the contrary instead, that the one does the affecting and the two the being affected.

There would seem, then, on the basis both of these and other such considerations, that there is some reason to think that the elements are three in number, as we said, but no longer any to think that there are more than three; for one is sufficient for being affected, while, if there are four, there will be two contrarieties, and a separate intermediate nature will be needed for each. If, on the other hand, being [just] two, they can generate things out of each other, then one of the two contrarieties would be superfluous. Moreover, it is impossible for there to be more than one first contrariety. For substance is one kind of being, so that the starting-points can differ only in being prior or posterior to each other, and not in kind; for in any one kind there is always one contrariety, all the other contrarieties seeming to be referred back to one.

It is evident, then, that the elements are neither one in number, nor more than two or three—but whether they are two or three involves, as we said,[40] much puzzlement.

1.7
The Number of Starting-Points (2): Our Own Account

We will now give our own account, first discussing all cases of coming to be; for the procedure that is in accord with nature is first to say what is common to all cases, and then to get a theoretical grasp on what is special to each one.

For we say that one thing comes to be from another, indeed, a distinct one from a distinct one, whether speaking about simple things or about compound ones. I mean this: it is possible for the human to come to be musical, and it is possible for the not musical to come to be musical or for the not musical human to come to be a musical **190ᵃ1** human. By "a simple thing that comes to be [something]," then, I mean the human

38. *GC* 330ᵃ30–ᵇ7.
39. 187ᵃ16–17.
40. 189ᵃ21, ᵇ17.

and the not musical, and by "a simple thing that [something is] coming to be" I mean the musical. By "a compound one" I mean both the thing that comes to be and the thing that comes to be it, whenever we say that the not musical human comes to be a musical human.

In some of these cases we say not only that this comes to be something but that it comes to be from something—for example, musical from not musical—but we do not say it in all cases; for musical does not come from human, but rather a human came to be musical.

Among things that come to be [something] that we called the "simple" ones, some remain when they come to be [that thing], while others do not; for the human remains and is human when he comes to be musical, while the not musical and the unmusical, whether simple or compound, do not remain.

Having made these distinctions, there is this to grasp from every case of coming to be, provided we look at them in the way we described, that there must always be some underlying subject, what comes to be [something], and even if it is one in number, in form it is not one (by "in form" I mean the same as in account); for the being for the human is not the same as the being for the unmusical. And the one remains and the other does not remain. The thing that is not an opposite remains (for the human indeed remains), but the not musical and the unmusical do not remain, and nor does the thing composed of both—for example, the unmusical human.

We say that something comes to be from something, and not that it comes to be something, chiefly in the case of what does not remain—for example, that musical comes to be from unmusical, but not that it does so from human. Nonetheless, we do sometimes also speak in this way about what does remain; for we say that a statue comes from bronze, not that the bronze comes to be a statue. As for what comes to be from what is opposite and does not remain, we speak of it in both ways, saying both that it comes to be from something and that it comes to be something; for we say both that from unmusical it comes to be musical and that the unmusical comes to be musical. That is why we also say the same about the compound; for we say both that from an unmusical human the musical human comes to be and that the unmusical human comes to be musical.

Since things are said to come to be in many ways, and some things are said not to come to be but to come to be a this something, while only substances are said to come to be unconditionally, it is evident that, in the other cases, by contrast, there must be some underlying subject that comes to be (for in fact when a quality, a quantity, a relative to something else, a time[41] or a place comes to be, it is of some underlying subject, because a substance is the only thing that is never said of any other underlying subject, while all the others are said of a substance).

41. Reading καὶ ποτὲ.

190ᵇ1 But that substances and the other[42] things that are unconditionally beings also come to be from an underlying subject will become evident on investigation. For in every case there is something that underlies, from which the thing comes to be—for example, plants and animals come to be from seed. And among the things that unconditionally come to be, some do so by change of shape (for example, a statue), some by addition (for example, things that grow), some by subtraction (for example, [the statue of] Hermes from the stone), some by composition (for example a house), some by alteration (for example, things changing with respect to their matter). And it is evident that everything that comes to be in this way comes to be from an underlying subject.

So it is clear from what has been said that whatever comes to be is always composite, and there is, on the one hand, one thing that comes to be, and, on the other, the thing that the former comes to be. And the latter is twofold: either the underlying subject or the opposite. By "the opposite" I mean, for example, the unmusical, and by "the underlying subject," the human; and the lack of figure, the lack of shape, or the lack of order is the opposite, while the bronze, the stone, or the gold is the underlying subject.

It is then evident—if indeed there are causes and starting-points of the beings that are by nature, from which they primarily are or have come to be, not coincidentally but each the thing that is said to be in accord with its substance—that everything comes to be from both the underlying subject and the shape; for the musical human is composed in a way of human and musical; for resolutions of its account[43] are into the accounts of these two. It is clear, then, that whatever comes to be, comes to be from these things.

The underlying subject, however, though one in number, is two in form; for, on the one hand, there is the human, the gold, and, in general, the countable matter, which is more a this something, and it is not coincidentally that what comes to be comes to be from it; on the other hand, there is the privation (that is, the opposite), which is coincident. And the form is one—for example, the order, the musicality, or anything else predicated in this way.

That is why we must say that in one way there are two starting-points, and in another way that there are three. And in one way the contraries are starting-points—for example, if we say they are the musical and the unmusical, the hot and the cold, or the harmonious and the unharmonious. But in another way they are not, for contraries cannot be affected by each other.[44] [The resulting puzzle] is also resolved due to the fact that the underlying subject is something else; for it is not a contrary.

So in a way the starting-points are no more numerous than the contraries, but are (one might almost say) two in number, yet not two in every way either (because the

42. Retaining ἄλλα.
43. Reading διαλύσεις γὰρ τὸν λόγον.
44. 189ᵃ20–26.

being for them is distinct), but rather three; for the being for the human and for the musical are distinct, as are the being for the lack of shape and the being for bronze. **191ᵃ1**

How many starting-points there are of natural beings that come to be, then, and in what way they are so many, has now been stated. And it is clear that there must be something to underlie the contraries, and that the contraries must be two in number. In another way, this is not necessary; for just one of the contraries, by its absence and presence, is sufficient to produce the change. 5

As for the underlying nature, it is scientifically knowable by analogy. For as the bronze stands to the statue, the wood to the bed, or as what lacks a shape before it gets its shape stands to anything else that has a shape, so the underlying nature stands to a substance, a this something, and a being. 10

This, then, is one starting-point, although it is neither one nor a being in the way a this something is; another one, the account;[45] and a further one is the contrary of this: the privation. In what way these are two, and in what way more, has been stated above.

First, then, it was stated[46] that only the contraries were starting-points, later, that it was necessary for there also to be something else to underlie them, and for the starting-points to be three. And from what we have said just now it is evident what the differentia of the contraries is,[47] how the starting-points stand to each other, and what the underlying subject is. But whether the form or the underlying subject is substance is not yet clear. However, that the starting-points are three, in what way they are three, and what mode [of being] they have, is clear. From these considerations, then, we should be able to get a theoretical grasp on how many starting-points there are and what they are. 15 20

1.8
A Puzzle of the Ancient Thinkers Solved

We will next argue that this is also the only way to resolve the puzzle of the ancient thinkers. For those who were the first to inquire philosophically about the truth and the nature of beings were turned aside, and, as it were, diverted from their route, by their inexperience,[48] and say that none of the beings either comes to be or passes away, because what comes to be must come to be either from what is or from what is not, both of which are impossible; for what is cannot come to be (for it already is), while from what is not nothing can come to be; for there must be[49] some underlying 25 30

45. Reading μία δὲ ὁ λόγος.
46. 189ᵃ9–10, ᵃ33–ᵇ1.
47. I.e., that one is the lack or privation of the other.
48. In dialectic.
49. Reading δεῖ.

subject [for it to come from]. And developing the consequences of this, then, they went on to say that there is no plurality of things but only being itself.

They embraced this belief, then, because of the foregoing considerations. We, on the other hand, say that the claim that something comes to be from what is or from what is not, or that what is not or what is affects something or is affected or comes to be something of whatever sort, is in one way no different from the claim that the **191b1** doctor affects something or is affected, or that something is or comes to be from a doctor. So, since we say this latter thing in two ways, it is clear that we also say in two ways that [something comes to be] from what is and that what is affects or is affected.

A doctor builds a house not insofar as he is a doctor but insofar as he is a builder, and comes to be pale not insofar as he is a doctor but insofar as he is dark. But he cures and comes to be ignorant of medicine insofar as he is a doctor. So, since we in the strictest sense say that a doctor acts on something, is affected by something, or comes to be something from being a doctor, when it is insofar as he is a doctor that he acts on it, is affected by it, or comes to be it, it is clear that to say that something comes to be from what is not also signifies this: coming to be from it insofar as it is what is not.

The ancient thinkers abandoned the puzzle through failing to make this precise distinction, and, because of their ignorance of it, added so much more ignorance to it that they thought that nothing else comes to be or is [besides being itself], and thus did away with all coming to be whatever.

We too say, as they do, that nothing unconditionally comes to be from what is not, but that things do, nonetheless,[50] come to be from what is not—for example, coincidentally (for a thing comes to be from the privation, which is intrinsically something that is not, and which is not a constituent of the thing that results; but this causes wonder, and it seems impossible that anything could come to be in this way from what is not).

Similarly, there is no coming to be either from what is or of what is, except coincidentally. But in that way this too can come about, in the same way as, for example, if animal comes to be from animal, and a certain sort of animal from a certain sort of animal. For example, if dog came to be from horse.[51] For the dog would come to be not only from animal of a certain sort, but also from animal, although not insofar

50. Reading ὅμως.

51. Rejecting the addition of ἐκ κυνὸς ἢ ἵππος. What we are to do is consider an entirely imaginary case of dog coming to be from horse in keeping with the embryology of *GA* 768b5–12, so as to distinguish the kind *animal* (common to dog and horse) from its various forms (*dog*, *horse*) in a vivid way. At a certain stage in the embryological development of the imaginary dog it is already animal, due to the relevant movements in the male progenitor's seed having already been transferred to the female menses. Subsequently, it becomes an animal of a certain sort, but it does not do so from animal insofar as it is animal, since it is already that (hence, "exists already" at 191b22–23). Indeed, if it were to become an animal of a certain sort from animal insofar as it is animal, it would surely become a horse. That it becomes a dog shows that it is not from (the kind) animal that its being a dog derives. Hence it is not from (the "kind") what

as it is animal; for that exists already. But if a certain sort of animal is to come to be, not coincidentally, it will not be from animal, and if a certain sort of thing that is is to come to be, it will not be from a thing that is, nor from a thing that is not. For we have said[52] what "from what is not" signifies: from what is not insofar as it is what is not.

Further, we also do not do away with [the principle that] everything either is or is not.

This, then, is one way [of resolving the puzzle], but there is another in that the same things can be said either with respect to the capacity or with respect to the activity. But this has been discussed with more exactness elsewhere.[53]

So, precisely as we have said, the puzzles due to which people are compelled to do away with some of the things we mentioned are now resolved; for this is why the earlier thinkers too were so much diverted from their route in the case of coming to be, passing away, and change generally; for if they had apprehended this nature,[54] all their ignorance would have been dissolved.

1.9
More on Starting-Points

Other thinkers, indeed, have touched on this, but not adequately. For, in the first place, they agree that a thing comes to be unconditionally from what is not, and that on this point Parmenides spoke correctly. And then it appears to them that if this **192^a1** nature is one in number, it is also one in potentiality, which is a very different thing.

For we say that matter and privation are distinct, and that one of these, the matter, coincidentally is not, while the privation intrinsically is not, and that the matter is even close to being—in a way is—substance, while the privation[55] is in no way substance. The other thinkers, by contrast, identify what is not with the great and the small alike, whether taken together or separately. So their three things[56] and ours are entirely distinct. For they got so far as to see that there must be some underlying nature, but they make it one; for even if someone[57] makes it a dyad, calling it "the great and the small," he still does the same; for he overlooks the other nature.[58]

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is (= being) or what is not (= not being) that a certain sort of thing that is (= a certain sort of being) comes to be.

52. 191^b9–10.

53. *Met.* 1048^a35–^{b}9, 1069^b15–20.

54. I.e., the underlying subject (191^a8).

55. Reading στέρησιν.

56. The great, the small, and the one (187^a17–18).

57. Plato.

58. The privation.

For the nature that remains is a joint cause, together with the shape, of the thing that comes to be, just as a mother is, while the other part of the contrariety might often appear, if thought is focusing intensely on its production of bad effects,[59] not to be at all. For we say that there is one thing that is divine, good, and sought after, and a second that is contrary to the first, and a third that naturally yearns for the first and, in accord with its own nature, strives for it, while it follows on their view that the contrary strives for its own destruction. And yet the form cannot yearn for itself, because it is not in a state of need, and neither does the contrary (for contraries are destructive of each other), instead it is the matter that does the yearning, just as female yearns for male and shameful for noble—except not the intrinsically shameful, but the coincidentally so,[60] and not the intrinsically female, but the coincidentally so.[61]

In one way too the underlying nature passes away and comes to be, and in another way it does not. For as that "in which," it does intrinsically pass away (for what passes away—the privation—is present *in* it); but as what is potentially, it does not intrinsically pass away, but must be incapable of passing away and coming to be. For if it came to be, there must have been some first underlying subject from which it came to be and is present in it. This is the [material] nature itself, so that it will be before coming to be [which is impossible]. (For by "matter" I mean the first underlying subject of each thing from which it comes to be and which is present in it non-coincidentally.) And if it passes away, it will come to this [material nature] at last, so that it will have passed away before it has passed away [which is also impossible].

To make an exact determination about the starting-point in terms of form, whether it is one or many, and what it is or they are, is the work of primary philosophy, so it may be set aside till the appropriate time comes for that.[62] But about the
192b1 forms of things that are natural and capable of passing away, we will speak in the expositions that follow.

That there are starting-points, then, what they are, and how many in number they are, we may take to be determined in the foregoing way. Let us now proceed after first making a fresh start.

59. Cases of passing away, destruction, and death, which may be attributed to a sort of not being (present of form) (*Met.* 1013b11–15).

60. The noble is associated with "order, proportion, and definiteness" (*Met.* 1078b1). Since these are formal elements, this is a case of matter (some underlying subject that is coincidentally shameful) yearning for form (nobility).

61. What is coincidentally female is the material element in reproduction (the menses or female seed), and what it "yearns for" in yearning for male is, again, the formal element.

62. *Met.* 7–9, 12.

BOOK 2

2.1
What Nature Is and What It Is to Be by Nature

Among the beings, some are by nature, while others are due to other causes. Those that are by nature are animals and their parts, plants, and the simple bodies—for example, earth, fire, air, and water (for we say that these and things like them are by nature). All these things manifestly differ from things that are not composed by nature. For each of them has within itself a starting-point of moving and being at rest—some with respect to place, some with respect to increase and decrease, others with respect to alteration.

A bed, by contrast, or a cloak, or anything else of that kind, insofar as each such predicate applies to it—that is, to the extent that it is a product of craft—has no innate impulse to change. But insofar as it is coincidentally made of stone, earth, or a mixture of the two, to that very extent, it does have one. This is because nature is a sort of starting-point and cause of moving and being at rest in that to which it belongs primarily, intrinsically, and not coincidentally. (I say "not coincidentally" because, for example, someone, being a doctor, might come to be a cause of health to himself. Nonetheless, it is not insofar as he is made healthy that he possesses the craft of medicine, but rather being a doctor and being made healthy are coincident in the same person. That is why they are usually separated from each other.)

It is the same way with other things that are produced; for none of them has within itself the starting-point of its production, but in some cases (such as a house and each of the other artificial things) the starting-point is in something else and external, while in others (those that may be coincidental causes to themselves) the starting-point is in them, but not intrinsically.

Nature, then, is what has been stated. And things that have this sort of starting-point have a nature. And each of them is a substance; for they are a sort of underlying subject, and a nature is always in an underlying subject. And these things are also in accord with nature, as too is whatever belongs intrinsically to them, as spatial movement upward belongs to fire; for this neither is nor has a nature but is by nature and in accord with nature. **193^{a}1**

What nature is, then, what is by nature, and what in accord with nature, has now been stated. That there is such a thing as nature it would be ridiculous to try to prove; for it is evident that there are many beings of the relevant sort. And to prove what is evident by means of what is not evident is characteristic of someone who cannot judge what is known by means of itself and what is not known by means of itself (and it is not unclear that this can happen to someone; for someone who was born blind may deduce things about colors). So for such people it is necessary for the argument to be about [mere] names, while they understand nothing.

It seems to some people that the nature and substance of each of the beings that are by nature is the first component present in it, which is intrinsically unshaped—for example, the wood is the nature of the bed, and the bronze of the statue. It is a sign of this, Antiphon says, that if someone were to bury a bed, and the decomposing material were to acquire the capacity to send up a shoot, what came up would not be a bed but wood—his supposition being that the disposition of the material that is in accord with convention and craft knowledge belongs coincidentally to the wood, while the substance is what in fact remains continuously while these things happen to it. And if each of these materials is also related to another in the same way (for example, bronze and gold to water, bones and wood to earth, and similarly too with anything else whatever), then that would be their nature and substance.

That is why some people say that fire is the nature of the beings, some that earth, air, or water is, some that some of them are, and others that all of them are. For whatever any of these people took to be of this sort—whether it was one or more than one—this or these he declared to be the substance in toto, everything else being affections, states, or dispositions of these, and declared this or these to be eternal (for they do not change from themselves), while other things come to be or pass away an unlimited number of times.

In one way, then, something is said to be nature when it is the first underlying matter for each of the things that have within themselves a starting-point of movement and change.

In another way, what is said to be nature is the shape—that is, the form—that is in accord with the account. For just as something is said to be [a work of] craft when it is in accord with craft knowledge and produced by craft, so something is said to be [a work of] nature when it is in accord with nature and produced by nature. And as in the one case we would not yet say that a thing is at all in accord with craft if it were only potentially a bed and had not yet the form of a bed, or that it is [a work of] craft, so it is in the case of things composed by nature; for what is only potentially
193b1 flesh or bone, before it acquires the form that is in accord with the account by which we define flesh or bone and say what it is, neither has yet its own nature nor is it by nature. So in this other way the nature of things that have within themselves a starting-point of movement is the shape, that is, the form, which is not separable except in account. (What is composed of both [form and matter] is not nature, but by nature—for example, human being.)

In fact, the form is more nature than the matter is; for each thing is said to be when it actually is more than when it potentially is.

Further, human comes to be from human, but not bed from bed. That in fact is why some people say that the shape is not the nature but the wood, because if it were to send up a shoot, it would not be a bed that comes up but wood. But if the wood

is therefore nature, the shape too is nature; at any rate,[63] human comes to be from human.

Further, when we speak of nature as coming to be,[64] it is as a route to nature [as possessed]. For it is not said of things in the way medical treatment is, which is a route not to the craft of medicine but to health; for medical treatment must proceed from the craft of medicine and not to it. But it is not in this way that nature (*phusis*) [as coming to be] is related to nature [as possessed], rather what is naturally growing (*to phuomenon*), insofar as it is naturally growing, proceeds from something to something. What is it, then, that is growing? Not the thing it is growing from, but the one it is growing into. The shape, therefore, is nature.

But something is said to be shape or nature in two ways; for the privation too is in a way form. Whether or not there is a privation and a contrary involved in unconditional coming to be, however, we must investigate later.[65]

2.2
Natural Science Distinguished from Mathematics and First Philosophy

Since we have distinguished the number of ways in which things are said to be nature, the next thing is to get a theoretical grasp on how the mathematician differs from the natural scientist (for natural bodies too have planes, solids, lines, and points, which are the things the mathematician investigates). Further, on whether astronomy is distinct from natural science or a part of it; for if it belongs to the natural scientist to know what the sun or the moon is, for him not to know their intrinsic coincidents would be absurd—especially since it is evident that those who speak about nature discuss the shapes of the sun and the moon, and in particular whether the earth and the cosmos are spherical or not.

The mathematician too busies himself about these things, although not insofar as each of them is the limit of a natural body, nor does he get a theoretical grasp on the coincidents of natural bodies insofar as they are such. That is why he separates them; for they are separable from movement by the understanding, and so their being separated makes no difference, nor does any falsehood result from it.

Those who speak about the Forms do this too, though it escapes their notice; for they separate natural objects though these are less separable than mathematical ones. This would become clear if one were to try to state the definitions both of the objects themselves and their coincidents. For odd and even, straight and curved, and further, number, line, and figure will be without movement, while flesh, bone, and human will not, but rather all of them are said of things just as snub nose is and not as curved is. This is also clear from the more natural-science-like parts of mathematics, such as

63. Reading γ'.
64. *Met.* 1014^{b}16–17.
65. 5.1, *GC* 1.3.

optics, harmonics, and astronomy; for these are in a way the reverse of geometry. For while geometry investigates natural lines, but not insofar as they are natural, optics investigates mathematical lines, but not insofar as they are mathematical, but rather insofar as they are natural.

But since nature is [said of things] in two ways, form and also matter, we must get a theoretical grasp on it as if we were investigating what snubness is, so that we must get a theoretical grasp on natural things neither without their matter nor with regard to their matter [alone]. For of course there might be also a puzzle about this, since there are two natures, as to which is the concern of the natural scientist. Or is he concerned with the combination of the two? But if with the combination of the two, he is also concerned with each of them. Does it belong to the same science, then, or to distinct ones, to know each of them?

If we look to the ancient thinkers, natural science would seem to be concerned with matter [alone] (for it was only very slightly that Empedocles and Democritus touched on form and essence).

If, on the other hand, craft imitates nature, and if it belongs to the same science to know the form and, up to a point, the matter (for example, it belongs to the doctor to know health, and also bile and phlegm, in which health resides, and to the builder to know the form of a house, and also the matter, that it is bricks and beams, and similarly in the case of the others), then it belongs to the natural scientist to know both natures.

Further, knowledge of the for-the-sake-of-which—that is, the end—belongs to the same science as knowledge of the things that are for its sake. But nature is an end and a for-the-sake-of-which (for whenever a continuous movement has a certain end of its movement, this is a last thing[66] and the for-the-sake-of-which; that is why the poet[67] spoke ridiculously when he said, "he has reached the [bad] end for which he was born," since by "end" we mean not every last thing, but the best one). For the crafts produce their matter, some unconditionally, while others make it good relative to the work.[68] And we make use of all things as if they were there for us (for we also are in a way an end; for the end is twofold,[69] as was said in *On Philosophy*[70]).

There are two crafts that rule over the matter and have knowledge of it, the craft **194b1** concerned with the use and the architectonic one concerned with production. That is why the one concerned with the use is in a way architectonic, but it differs from the other insofar as it knows the form, although the architectonic one as productive[71] knows the matter; for the captain knows and prescribes what sort of form the rudder must have, while the other knows what sort of wood it must be made from and by

66. Rejecting the addition of τὸ.
67. Identity unknown.
68. 194b5–8.
69. *DA* 415b3–4.
70. Not in F10–F52, which are the extant fragments.
71. Reading ἡ δὲ ἀρχιτεκτονικὴ ἡ ὡς ποιητική.

what movements it will be made. In the case of the products of craft, then, it is us who produce the matter for the sake of the work, while with natural things the matter is already present.

Further, matter is relative to something; for there is one [sort of] matter for one form, and another for another.

Up to what point, then, must the natural scientist know the form and the what-it-is? Or just as the doctor knows sinews and[72] the blacksmith bronze, is it in fact[73] up to the point of knowing what each of them is for the sake of, and knowing about the ones that, though separable in form, are in matter? For human is begotten by human and sun.[74] But the way the separable is, and what it is, is the work of primary philosophy to determine.

2.3
What Sorts of Causes There Are and in What Way They Are Causes

Having determined these things, we must investigate how many and what sorts of causes there are. For since our study is undertaken for the sake of knowledge, and we do not think we have knowledge of each thing until we have grasped the why of it, which is to grasp its primary cause, it is clear that we must also do this in the case of coming to be, passing away, and every sort of natural change, so that by knowing the starting-points of these we may try to refer back to them each thing we are inquiring about.

Something is said to be a cause if it is the component from which a thing comes to be—for example, the bronze of a statue or the silver of a bowl, and also the kinds of these. The form or paradigm, that is, the account of the essence, and kinds of this (for example, of the octave, the ratio 2:1 and number in general), and the parts included in the account. Further, that from which the change or rest from change first starts—for example, the person who has deliberated is cause [of the action] and the father of his child and, in general, the producer is cause of the thing being produced and the change-maker of what is changed. Further, the end, and this is the for-the-sake-of-which—for example, of taking walks health is the end; for why does he take walks? In order that he may be healthy, we say. And in speaking that way we think we have presented the cause. Also, anything, then, that comes to be as an intermediate before the end, when something else has started the movement—for example, in the case of health, making thin, purging, drugs, or instruments; for all these are for the sake of the end, although they differ from each other in that some **195^{a}1** are works and others instruments.

72. Reading καὶ.
73. Retaining γὰρ.
74. *GC* 336^{a}23–^{b}10, *Met.* 1071^{a}13–17.

These, then, are pretty much all the ways in which things are said to be causes, and because they are said to be such in many ways it follows both that there are many causes of the same thing, and not coincidentally (as, for example, a statue has both the craft of sculpture and the bronze as causes—not in accord with its being another thing[75] but insofar as it is a statue—although not in the same way, but the one as matter and the other as that from which the movement derives), and that things can be causes of each other (as, for example, exercise [is a cause] of good physical condition and the latter of exercise, although not in the same way, but the one as end and the other as the starting-point of movement). Further, the same thing can be the cause of contraries; for the thing that, when present, is cause of so-and-so, we sometimes hold causally responsible, when absent, for the contrary—for example, the cause of a shipwreck is the absence of the captain whose presence was a cause of its preservation.

All the causes now mentioned fall into four most evident ways [of being causes]. For phonetic elements[76] are causes of syllables, matter of artifacts, fire, and all such things, of bodies, the parts of the whole, and the hypotheses[77] of the conclusion, as being causes in the sense of that from which. And of these some are causes as underlying subject (for example, the parts), some as the essence (for example, the whole, the mode of composition, and the form). And the seed, the doctor, the deliberator, and, in general, the producer are all starting-points from which comes change or rest. The remainder are causes as the end and the good of other things; for what other things are for the sake of tends to be the best and their end. Let us assume that it makes no difference whether we say good or apparent good.

These, then, are the causes and this is the number of their forms, but the ways of being causes, though many in number, also come under comparatively few headings. For things are said to be causes in many ways, and those within the same form are said to be prior or posterior to each other—for example, [as a cause] of health, the doctor and the craftsman; of the octave, the double and number; and in every case the encompassing causes and the particular ones.

Further, there are coincidental causes and their kinds—for example, [as a cause of] a statue, in one way Polyclitus, in another a sculptor, because the sculptor coincides with Polyclitus, and, as examples of what includes the coincidental cause, a human is a cause of the statue, or, in general, an animal (because Polyclitus is human and a human is an animal). And among coincidental causes some are more remote than others, some less—for example, if the pale and the musical were said to be causes of the statue.

Beyond[78] all the things said to be causes either properly or coincidentally, however, some are said to be so potentially, others actively—for example, [as a cause of] the house's being built, a builder, on the one hand, and a builder building, on the other.

75. I.e., not in a coincidental way.
76. Phonetic elements in spoken syllables are roughly equivalent to letters in written ones.
77. Here premises, which need not be hypothetical in status.
78. Reading παρὰ.

Similarly, the things that causes are causes of will also be said to be in the ways mentioned—for example, this statue, a statue, or, in general, a likeness, or this bronze, bronze, or, in general, matter; and similarly in the case of coincidental [effects].

Further, both the proper and the coincidental may be said to be causes in combination—for example, not Polyclitus or sculptor but Polyclitus the sculptor.

But still all of these things are [just] six in number, each said to be in two ways: either as the particular, as the kind, as the coincidental, or as the kind of the coincidental is, or as these are either as combined or as taken simply, and all of them either actually or potentially. But they differ to the extent that what is actual and what is particular exists, or does not exist, at the same time as the things it causes—for example, this person curing at the same time as this one recovering his health, this builder building with this building being built. But this is not always the case with what are potentially causes. For the house does not pass away at the same time as the builder.

Here, as in the other cases, we must always seek the most precise cause of each thing (for example, a human is building because he is a builder, and the builder is building in virtue of the craft of building; this latter, therefore, is the prior cause, and similarly in all cases).

Further, we must seek kinds of causes for kinds of things, and particular causes for particular things—for example, a sculptor is the cause of a statue, and this sculptor of this statue. And we must seek potential causes for potential effects, and actual causes for actual effects.

Let these determinations suffice, then, as to the number of causes and to the ways in which they are causes.

2.4
Luck and Chance as Causes

But luck and chance are also said to be causes, and many things are said to be and to come to be because of luck or because of chance. We must investigate, then, in what way luck and chance are included among the causes [we distinguished], whether luck or chance are the same or distinct, and, in general, what luck is and what chance is.[79]

For some people raise a puzzle as to whether luck or chance exist or not; for they say that in fact nothing comes to be by luck, but that everything that is said to come to be by chance or luck has some definite cause—for example, of someone's coming into the marketplace by luck and finding the person he wished but did not expect to meet, they say that the cause is his wishing to go shopping in the marketplace. And similarly in the case of other things that are said to come to be by luck, they say that it is always possible to find some thing—not luck—that is the cause, since if there were indeed such a thing as luck, it would appear truly strange and puzzling that none

79. $198^{a}2$–5, $197^{a}36$–$^{b}37$, 2.6.

of the ancient wise men who talked about the causes of coming to be and passing away ever determined anything about luck. On the contrary, it seems that they also thought that nothing is by luck. But this too is cause for surprise; for many things come about and are by luck and by chance, and, though people are not unaware that each of the things that come to be can be referred back to some [definite] cause (as the argument just given[80] says that does away with luck), nonetheless they all speak of some of these things as being by luck, others as not being by luck. That too is why the early wise men should have mentioned luck in some way or other.

But then they did not think either that luck was among the causes [they recognized]—for example, love, strife, understanding, fire, or anything else of that sort. Either way, then, it is strange, whether they supposed that there was no such thing as luck, or that there was such a thing but neglected to discuss it. Especially when they sometimes make use of it, as Empedocles does when he says that air is not always separated out on top but as luck would have it. At any rate, he says in his cosmogony that "it happened to run in this way then, but often in another way."[81] And he says that most of the parts of animals come to be by luck.

Other people[82] make chance the cause of this heaven and of all the cosmoses; for they say that the vortex came to be by chance, as did the movement that separated things out and put in place the present order of the universe. And this itself merited yet more surprise; for, on the one hand, they say that animals and plants neither are nor come to be by luck, but that nature, understanding, or something else of that sort is the cause (for it is not just any random thing that comes to be from a given sort of seed, but an olive tree from one sort and a human being from another), while, on the other hand, they say that the heaven and the most divine of visible things came to be by chance, and have no cause of the sort that animals and plants have. And yet if such is the case, this very fact merits attention, and something might well have been said about it. For in addition to the other respects in which what they say is strange, it is even stranger to say it when they see nothing in the heaven coming to be by chance, while among the things that [in their view] are not by luck many do come to be by luck. And yet for the contrary to happen would surely have been likely.

There are others,[83] though, who believe that luck is indeed a cause, but that it is unclear to human thought, as being a divine thing and very daimonic. So we must investigate what chance is and what luck is, whether they are the same or distinct, and how they fit into the causes distinguished.[84]

80. 196a1–7.
81. B53 DK.
82. E.g., Democritus.
83. E.g., Plato, *Laws* 709b.
84. 194b23–195a3.

2.5
How Luck and Chance Are Causes

In the first place, then, since we see that some things always come to be in the same way, and others do so for the most part, it is evident that luck or what is by luck is not the cause of either of these—either of what is by necessity and always or of what is for the most part. But since there are other things beyond these that come to be, which everyone says come to be by luck, it is evident that there is such a thing as luck and as chance; for we know that things of this third sort are by luck and that things that are by luck are things of this sort.

Among things that come to be, some do so for the sake of something, while others do not (and of the former, some are in accord with deliberate choice, while others are not in accord with deliberate choice, although both are among the things that are for the sake of something), so it is clear that among the things beyond those that are necessary or for the most part, there are some that admit of being for the sake of something. The ones that are for the sake of something are ones that might come to be as a result of thought or of nature. Whenever, then, something like this comes to be coincidentally, we say that it does so by luck (for just as being is either intrinsic or coincidental, in the same ways it is possible to be a cause—for example, the intrinsic cause of a house is what has the craft of building, but coincidentally it is the pale or the musical; and while the intrinsic cause is definite, the coincidental one is indefinite; for an unlimited number of things may coincide in one thing).

As has been said,[85] then, whenever a coincidental cause occurs among things that come to be for the sake of something, then they are said to be by chance or luck. (The difference between the two will be determined later;[86] but for now let us take as evident that both are found among things that are for the sake of something.)

For example: The man would have come for the sake of getting back his money when a debtor was collecting contributions for a feast, if he had known about it. But in fact he did not come for the sake of this. On the contrary, it was a coincidence that he came,[87] and [as if he] did so for the sake of getting back his money—this provided that he neither for the most part nor of necessity frequents that place. The end, however, getting back his money, although it is not one of the causes present in him, is among the things that can be deliberately chosen and are a result of thought. **197^{a}1** And in this case he is then said to have come there by luck. But if he had deliberately chosen, and for the sake of getting back his money, or if he always or for the most part frequented the place, then it was not by luck that he did so.

It is clear, therefore, that luck is a coincidental cause that is found among those of the things that are for the sake of something and in accord with deliberate choice.

85. 196^{b}23–24.
86. 197^{a}36–^{b}37.
87. Secluding αὐτῷ.

That is why thought and luck are concerned with the same things; for deliberate choice does not occur without thought.

The cause of things that might come to be by luck are of necessity indefinite. That is why luck too seems to be something indefinite and unclear to human beings, and why it might seem that in a way nothing comes to be by luck. For all these things are said correctly, that is, reasonably. For things do in a way come to be by luck; for they come to be coincidentally, and luck is a coincidental cause. Unconditionally, luck is not the cause of anything. For example, although a builder is cause of a house, coincidentally a pipe player is. And of the man's coming and getting back his money, though he did not come for the sake of this, the coincidental causes are unlimited in number; for in fact he might have come because he wished to see someone, to be an accuser or defendant in court, or to go to the theater.

Also, it is correct to say that luck is something beyond reason; for a reason is about what always is or for what for the most part is, and luck is found in what is beyond these. So, since the causes in such cases are indefinite, luck too is indefinite.

Nevertheless, in some cases one might raise a puzzle as to whether any random thing might be a cause of what is [by] luck—for example, of health, the wind, or the heat of the sun, but not having had a haircut. For some coincidental causes are more closely relevant than others.

Luck is said to be good when something good results, bad when something bad results, and is called "being lucky" or "being unlucky" when the results are of some magnitude. That is why someone who comes within a hair's breadth of a great evil or a great good is said to be lucky or to be unlucky, because thought speaks as if the thing were already had; for by a hair's breadth seems no distance at all.

Further, it is reasonable that good luck is unstable; for luck is unstable; for nothing that is by luck can be either always or for the most part the case.

Both luck and chance, then, are coincidental causes, as was said, that are found among things that admit of coming to be neither unconditionally nor for the most part, and, of these, among the ones that happen for the sake of something.

2.6
Luck and Chance Defined and Distinguished

They differ in that chance extends more widely; for everything that is by luck is by chance, but not everything that is by chance is by luck. For luck and what is by luck
197b1 belong to whatever good luck and, in general, action also belong. That is why luck is of necessity concerned with what is doable in action. A sign of this is that good luck seems to be the same as happiness or close to it, and happiness is a sort of action; for it is doing well in action. So whatever cannot do an action cannot do anything by luck either.

And it is because of this that no inanimate object, wild beast, or child does anything by luck—because they do not have deliberate choice. Nor do good luck or bad luck belong to them, except in virtue of some similarity—as Protarchus said that the stones from which altars are made have good luck, because they are esteemed, while their fellows are trodden underfoot. Nevertheless, even these things are affected by luck in a way, when someone doing some action concerning them does so by luck, but otherwise they are not.

Chance, on the other hand, is found both in the other animals and in many inanimate objects—for example, the horse came by chance, we say, in that it was saved because it came, but did not come in order to be saved. And that the tripod fell [on its feet] is a case of chance; for, though it stood that way for the sake of being sat on, it did not fall for the sake of being sat on.

So it is evident that among things that unconditionally come to be for the sake of something, whenever those that come to be do not do so for the sake of what actually results, the cause being external, we say that they come to be by chance. And we say that the ones that come to be by luck are the ones among those that come to be by chance that can be deliberately chosen by those having deliberate choice.

A sign of this is the term "pointless," because it is said of something when what it is for the sake of does not come to be, but [only] what was for that thing's sake.[88] For example, suppose walking is for the sake of loosening the bowel, if this did not come about when someone has walked, we say that the person walked pointlessly and that his walking was pointless. The supposition being that this is what is pointless: what is naturally for the sake of something else, when it does not accomplish what it was—and is by nature—for the sake of. For if someone said that his washing himself was pointless because the sun was not eclipsed, he would be ridiculous; for the one was not done for the sake of the other. It is chance, then, as even its name (*automaton*) suggests, when a thing (*auto*) comes to be pointlessly (*matên*). In fact, the stone that fell did not do so for the sake of hitting the man; it was by chance, therefore, that the stone fell, because it might have fallen due to someone and for the sake of hitting someone.

The separation of chance from luck is greatest in things that come to be by nature; for if something comes to be contrary to nature,[89] we say that it came to be not by luck but rather by chance. But even this is distinct from chance; for the cause of the latter is external, that of the former internal.

What chance is, then, what luck is, and in what respect they differ from each other, has now been stated. And as for the way in which they are causes, each of them **198^{a}1** is a starting-point from which movement originates; for each is always a cause of what is either by nature or a result of thought, although their number is indefinite.

88. Reading τὸ οὗ ἕνεκα, ἄλλ' ὃ.
89. *Met.* 1032^{a}28–32, 1034^{b}4–6.

But since chance and luck are causes of things of which either understanding or nature might have been the cause, whenever something comes to be a coincidental cause of these same things, and as nothing coincidental is prior to what is intrinsic, it is clear that neither is the coincidental cause prior to the intrinsic one. Therefore, chance and luck are posterior to understanding and nature. So however true it may be that chance is the cause of the heaven, understanding and nature must be prior causes both of many other things and of this universe.[90]

2.7
The Natural Scientist Must Know All Four Causes

It is clear, then, that there are causes and that they are as many in number as we stated;[91] for the why of things encompasses that many; for the why is referred back at last to the what-it-is, in the case of immovable things (for example, in mathematics; for there it is referred back at last to the definition of straight, commensurable, or something else); or to the first cause of movement (for example, why did they go to war?—because they were raided); or to what it is for the sake of (for example, in order that they may rule); or, in the case of things that come to be, to the matter. It is evident, then, that these are the causes and this is how many they are.

But since the causes are four in number, the natural scientist must know them all, and to give the why in a natural scientific way must refer it back to all of them—the matter, the form, the cause of movement, the for-the-sake-of-which. But the last three often amount to one; for the what-it-is and the for-the-sake-of-which are one, and the first source of the movement is the same in form as these (for a human begets a human), and so it is, in general, in the case of things that cause movement by being in movement.

Those that cause movement without being in movement, by contrast, are no longer part of natural science; for they do not cause movement by having a movement or a starting-point of movement within themselves, but are immovable. That is why there are three sorts of [scientific] studies,[92] one concerned with immovable things, one concerned with movable ones that are incapable of passing away, and one concerned with things that are capable of passing away.

So the why is given by referring back to the matter, the what-it-is, and the first cause of the movement. As a matter of fact, in the case of coming to be one investigates the causes most of all in this last way: by asking, what comes to be after what, what first affected or was affected, and in this way always going on to the next one in the series.

90. 196[a]24–26.
91. 194[b]23–195[a]3.
92. *Met.* 6.1.

The starting-points of natural movement are twofold. One of these is not natural; for it does not have a starting-point of movement within itself. Anything is of this sort if it causes movement without being itself in movement, just as what is entirely **198b1** immovable (that is, the first of all beings) does and also the what-it-is (that is, the shape); for it is the end and the for-the-sake-of-which. And so, since nature is for the sake of something, this cause must also be known and the why must be given in all ways—for example, from this that will necessarily result (whether from it 5 unconditionally or for the most part); if this is going to be [then that must first be so] (as from the premises the conclusion results); this is the essence; because it is better this way (not unconditionally better, but better in relation to the substance of each given thing).

2.8
Does Nature Act for an End?

We must first state, then, why nature is among the causes that are for the sake of 10 something, and then about necessity and what way it is present in natural things; for everyone refers things back to this latter cause, stating that since the hot, the cold, and each thing of this sort, then, is by nature such-and-such, certain other things of necessity are and come to be; for in fact if they mention any other cause, they just touch upon it, and let it go at that—one[93] mentioning love and strife, another the 15 [divine] understanding.[94]

There is thus a puzzle as to what prevents nature from acting not for the sake of something or because it is better, but as Zeus rains down rain[95]—not in order that the wheat may grow, but of necessity (for what has been drawn up must become cold, and what has become cold, having become water, must come down; but the growing of the wheat when this happens is coincidental). Similarly, if someone's wheat on 20 the threshing floor perishes, it does not rain for the sake of this, that the wheat may perish, but rather this is coincidental. So what is to prevent parts in nature too from being the same way (the front teeth, for example, of necessity growing out sharp and suitable for tearing apart, the molars broad and useful for grinding up nourishment), 25 inasmuch as they do not come to be for the sake of the given thing, but rather it was coincidental—and similarly with the other parts in which there seems to be the for-the-sake-of-which? Wherever, then, all the parts came to be just as if they had come to be for the sake of something, then the things [whose parts they were] survived, as a result—although by chance—of being suitably composed, while those that were not 30

93. Empedocles.
94. Anaxagoras.
95. An idiomatic way of saying, "it rains."

like that, such as the man-headed ox-progeny mentioned by Empedocles,[96] perished and continue to perish [when produced].

This is the argument, then, and any others that may be like it, that might raise a puzzle. But it is impossible for things to be like this. For these things we mentioned and all things that are by nature come to be as they do either always or for the most part, but none of the things that are by luck or chance does so. For it does not seem to be by luck or by coincidence that it rains often in winter, but if it does so in the dog days of summer; nor that there are heat waves in the dog days, but if there are in the winter. If, then, things seem to be either by coincidence or for the sake of something, and if these ones are neither by coincidence nor by chance, then they would be for the sake of something. But surely all such things are by nature, as even those who state the foregoing argument would say. The for-the-sake-of, then, is present in things that come to be and are by nature.

Further, in whatever has an end, it is for its sake that the things that come before, and the ones following them in order, are done in action. Then as things are done in action, so they are in nature, and as they are in nature, so each of them is done in action, provided there is no impediment. In action, things are done for the sake of something. Therefore, in nature too they are for the sake of something. For example, if a house were one of the things that came to be by nature, it would do so just as it now does by craft. And if things came to be not only by nature but also by craft, they would come to be just as they do by nature. One thing, therefore, is for the sake of another. In general, craft in some cases completes the things that nature is incapable of bringing to completion, while in others it imitates nature. If, then, what is in accord with craft is for the sake of something, it is clear that what is in accord with nature is as well; for in what is in accord with craft and in what is in accord with nature the relation of what comes after to what comes before is the same.

This is most evident in the case of the other animals, since they do not make things either by craft, by carrying out inquiries, or by engaging in deliberations—which is why some people are puzzled as to whether spiders, ants, and things of that sort do what they do by means of understanding or of some other capacity. And if we proceed a little further in this way, it is evident that even in plants things come to be that further the end—for example, leaves for the sake of shading the fruit. If, then, it is both by nature and for the sake of something that the swallow makes its nest and the spider its web, and if plants grow leaves for the sake of the fruit, and send roots down rather than up for the sake of nourishment, it is evident that this sort of cause is present in things that come to be and are by nature. And since nature is twofold, the one as matter and the other as shape, and since the latter is an end, and the other things are for the sake of the end, the shape must be the cause, the cause in the sense of the for-the-sake-of-which.

96. B61 DK.

Error, however, occurs even in what is in accord with craft (for grammarians have written incorrectly and doctors given the wrong medicine), so it is clear that it is also possible in what is in accord with nature. If, then, it sometimes happens in things that are in accord with craft that the for-the-sake-of-which is correct, and that in cases of error what is attempted is for the sake of something but fails to hit it, the same must also be so in the case of natural things, and monstrosities must be errors of the for-the-sake-of-which. Among the things composed at the start as well, therefore, the [man-headed] ox-progeny, if they were unable to reach a certain defining mark and end, must have come to be as a result of some defective starting-point, in just the way that, as things stand, they do so from defective seed.

Further, seed must come to be first, and not immediately the animals, and the "first whole-natured kind"[97] was a seed.

Further, the for-the-sake-of-which is also present in plants, though in a less articulated way. Among plants too, then, did olive-headed vine sprouts come to be, just as man-faced ox-progeny did, or did they not? For that would be absurd. But surely they would have to have, if indeed this also happened among the animals.

Further, among seeds too coming to be would have to be a matter of luck [on this view]. But the person who says this does away entirely with what is by nature and also with nature; for things are by nature when, from some starting-point within themselves, they arrive by a continuous movement at a certain end—from a given starting-point, though, the same thing is not reached in each case, nor is some random one, yet [the movement] is always to the same thing, provided there is no impediment.

The for-the-sake-of-which, and what is for its sake, might come to be by luck. We say, for example, that a guest-friend came by luck, paid the ransom, and then went away, when he did the action as if he had come for the sake of doing it, though it was not for the sake of doing it that he came. And so this is coincidental (for luck is one of the coincidental causes, as we said previously[98]). But when something comes to be always or for the most part, it does not do so coincidentally or by luck, but in what is natural it always does so in this way, provided there is no impediment.

It is absurd to think that a thing does not come to be for the sake of something, if the mover is not seen deliberating. For even craft does not deliberate;[99] and if the craft of shipbuilding were present in the wood, it would produce in the same way as nature. So, if the for-the-sake-of-which is present in craft, it is also present in nature. This is clearest when a doctor cures himself; for nature is like him.

It is evident, then, that nature is a cause, that is, one in the way that the for-the-sake-of-which is a cause.

97. Empedocles B62.4 DK.
98. 196b23–27.
99. Cf. *NE* 1112a34–b9.

2.9
The Necessity in Natural Things

As for what is by necessity [in natural things], we must ask whether it is hypothetical,
35 or also unconditional. For as things stand it is thought that what is by necessity is found in the coming to be in the way in which someone might suppose that the wall
200a1 of a house came to be by necessity, because heavy things by nature spatially move downward, and light ones upward. And so the stones and the foundations are down below, the earth is up above them because it is lighter, and the wooden logs are on the very top, for they are lightest. Nonetheless, though the wall does not come to be
5 without these, it did not in fact come to be because of them, except as matter, but rather for the sake of shelter and protection.

It is the same way in the case of all the other things in which the for-the-sake-of-which is present: although they could not come to be without things that have a necessary nature, they do not in fact come to be because of these, except as matter, but rather for the sake of something. For example, why is a saw such as it is? So
10 that this may be, and for the sake of this. But in fact it is impossible that this thing that the saw is for the sake of should come to be, unless the saw is made of iron. It is necessary, therefore, for it to be made of iron, if there is to be a saw and its work. The necessity, then, is hypothetical, but not [necessary] as an end; for the necessity lies in the matter, while the for-the-sake-of-which lies in the account.

15 The necessity found in mathematics and in things that come to be in accord with nature are in a way much the same; for since the straight is this, it is necessary that the angles of a triangle equal two right angles, but not the other way around—even though if the latter does not hold, the straight will not be this either. In things that come to be for the sake of something it is the reverse: if the end is or will be, the
20 previous things are or will be too, and just as in mathematics, where if the conclusion does not hold, the starting-point will not either, so here if the previous things are not or will not be, then neither will the end—that is, the for-the-sake-of-which. For the end is itself also a starting-point, although not of action but rather of rational calculation (and in mathematics the starting-point is the starting-point of the rational calculation; for there are no actions involved).

And so if there is to be a house, it is necessary for these things to come to be or to
25 be present, and, in general, the matter that is for the sake of something—for example, bricks and stones if there is to be a house. Yet the end does not exist because of these, except as matter, nor will it exist because of them. In general, however, if they are not present there will be neither house nor saw (in the case of a house if the stones are not present, in the case of a saw if the iron is not), just as in mathematics the starting-points will not hold if the triangle does not have [its interior angles equal to] two right angles.

30 It is evident, then, that the necessity in natural things is what is called "matter" and "the movements of the matter." And the natural scientist must state both causes,

but most of all the for-the-sake-of-which; for this is the cause of the matter, not the matter of the end. And the end is the for-the-sake-of-which and the starting-point springing from the definition and the account, as in the things that are in accord with craft—since a house is such-and-such sort of thing, these things must come to be or be present of necessity, or since health is this, these things must come to be or be present of necessity; and similarly if a human is this, these must be, and if these, these others. Presumably, necessity is also present in the account; for if the work of sawing is defined as such-and-such sort of division, it will not occur unless the saw has teeth of such-and-such a sort, and these cannot be of such-and-such a sort unless the saw is made of iron. For even in the account there are parts that stand as matter of the account.[100]

BOOK 3

3.1
Movement (1)

Since nature is a starting-point of movement and change, and our methodical inquiry is concerned with nature, we must not overlook what movement is; for if we are ignorant of this, we are necessarily ignorant of nature too. And once we have made determinations about movement we must try to inquire in the same way about the things that come next in order.

Movement seems to be one of the things that are continuous, and the unlimited first comes to light in what is continuous. That is also why those who define the continuous often make use of the account of the unlimited as well, on the supposition that what is divisible without limit is continuous. In addition, it seems that without place, void, and time, it is impossible for there to be movement.

Clearly, then, both because of this and because these things are common to everything [in nature] and universal, we must first undertake to investigate each of them (for the theoretical investigation of what is special is posterior to that of what is common). And first, as we said, we must investigate movement.

Some things, then, are actual only, others potential, others potential and actual,[101] being either a this something, a quantity, a quality, or likewise one of the other categories of being. Of what is relative, one sort is said of things with reference to excess and deficiency, another with reference to affecting and being affected, and, in general, with reference to what can move something and be moved; for what can move

100. $194^{a}12–15$.

101. Respectively, a substantial form, such things as the unlimited and the void, and matter-form compounds. Reading τὸ μὲν ἐντελεχείᾳ μόνον, τὸ δὲ δυνάμει, τὸ δὲ δυνάμει καὶ ἐντελεχείᾳ.

something can move what can be moved, and what can be moved can be moved by what can move it.

There is no movement beyond the things; for what changes always does so either with respect to substance, quantity, quality, or place, and we say there is nothing to take as common to these that is neither a this, nor a quantity, nor a quality, nor a place, nor any of the things in the other categories either; so there is no movement or change of anything beyond the ones we mentioned, since not even a being exists beyond the ones we mentioned.

Each of these belongs to everything in two ways—for example, the this (for in the one case it is shape, in the other its privation), with respect to quality (for in the one case it is white, in the other black), with respect to quantity (which in the one case is complete, in the other incomplete). It is the same way with respect to spatial movement, which in the one case is upward, in the other downward—alternatively, in the one case [of] what is light, in the other [of] what is heavy. So there are just as many forms of movement and change as there are of being.

Since there is a distinction with respect to each kind between actuality and potentiality, the actualization of what is potentially, insofar as it is such, is movement—for example, the actualization of the alterable, insofar as it is alterable, is alteration, the actualization of what is capable of increasing and of its opposite, decreasing (for there is no name common to both) is increasing and decreasing, the actualization of what is capable of coming to be and passing away is coming to be and passing away, and the actualization of what is capable of spatial movement is spatial movement. That movement is this is clear from the following: whenever what is buildable, insofar as it is what we say it is, is in actuality, it is being built, and this is building. And similarly with learning, curing, rolling, leaping, maturing, and aging.

Since, in some cases, the same things are both potential and actual, although not at the same time or in the same respect, but instead, for example, are actually hot and potentially cold, already it follows that many things will both affect each other and be affected; for everything of this sort will be at once capable of affecting and being affected. And so what naturally causes movement will itself be movable; for everything of this sort causes movement being itself moved. Some people even think that whatever causes movement is itself moved, but how things stand with regard to this will become clear from other considerations[102] (for there is one mover that is immovable[103]).

The actualization of what is potentially, when it is actually active, not insofar as it is itself but insofar as it is movable, is movement. By "insofar as" I mean this: The bronze is indeed potentially a statue, but nonetheless it is not the actualization of the bronze, insofar as it is bronze, that is movement; for the being for bronze is not the same as the being for something potentially movable, since if it were unconditionally

102. 8.5.

103. Reading τι τῶν κινούντων.

the same in account, the actualization of the bronze, insofar as it is bronze, would be movement. But, as was said, it is not the same (this is clear in the case of contraries; for to have the potential to be healthy and to have the potential to be sick are not the same—for in fact if they were, to be sick and to be healthy would be the same—though the underlying subject, whether it is healthy or diseased, whether it is moisture or blood, is one and the same). And since it is not the same, just as color and the visible are not the same either, it is evident that it is the actuality of the potential, insofar as it is potential, that is movement.

It is clear, then, that movement is this, and that it takes place when the actuality itself exists, and neither earlier nor later; for each thing [of this sort] admits of sometimes being active, sometimes not—for example, the buildable: the activation of the buildable, insofar as it is buildable, is building (for the activity is either this—the building—or the house). But when the house exists, what is buildable no longer exists: what is buildable is what is being built. It is necessary, therefore, for building to be the activity, and building is a sort of movement. And the same account also applies in the case of the other movements.

3.2
Movement (2)

That what was stated is correct is also clear from what others say about movement and from the fact that it is not easy to define it otherwise. For we cannot put movement and change in some other kind either. This is clear if we investigate where some people[104] put them, saying that movement is otherness or inequality or not being. But none of these—neither things that are other than something, nor things that are unequal, nor things that are not—is necessarily in movement, nor is change to these or from these, any more than to or from their opposites.

What causes people to posit movement as these is that it seems to be something indefinite, and the starting-points in one of the two columns of opposites, because they are privations, are indefinite; for none of them is either a this or a such-and-such sort or any of the rest of the categories. The cause of movement's seeming to be indefinite is that it cannot be posited unconditionally[105] either as a potentiality of beings or as an activation of them; for neither the thing that is potentially of a certain quantity nor what is actively of a certain quantity is necessarily moved, and movement seems to be a sort of activity, but incomplete activity. The cause of this is that the thing that is potentially, of which it is the activation, is incomplete. And because of this it is difficult to grasp what movement is; for it must be posited either as a privation or as a potentiality or as an activity that is unconditionally such. But manifestly none of

104. Plato, *Timaeus* 57e–58a.
105. Reading ἁπλῶς.

these is possible. And so the remaining option is that it must be the way we said, that
202^a1 it is a sort of activity, but the sort of activity we stated,[106] which, though difficult to discern, can exist.

Everything that moves things in the way stated[107] is also moved, that is, every mover that is potentially movable and whose immobility is rest (for in the case of what movement belongs to, its immobility is rest). For to affect this sort of thing, insofar as it is of this sort, is just what it is to move it. But this it does by contact, so it is at the same time affected. That is why movement is the actualization of the movable, insofar as it is movable, and this happens by contact with what is capable of moving it, so that the latter is also affected at the same time. The mover, however, is always the bearer of some form, whether a this, or of this quality, or of this quantity, which will be the starting-point and cause of movement, whenever it moves something—for example, what is actually a human being makes, from what is potentially a human being, a human being.

3.3
Mover and Moved

Also, a point that raises a puzzle: it is evident that movement is in the thing moved. For movement is the actualization of the movable by what can in fact[108] move something. And the activation of what is capable of moving something is no other than this; for there must be the actualization of both; for it can move something by having the potentiality to do so, and it is moving it by being active. But it is on the movable that the mover is capable of acting, so that the activation of both alike is one, just like the interval between one and two and between two and one, or the hill up and the hill down; for these things are one, but their account is not one; and similarly in the case of the mover and the moved.

This involves a logico-linguistic puzzle; for presumably there must be some activation of what is capable of affecting and of what is capable of being affected, the first of which is an affecting, the second a being affected; and the work and end of the first is a thing done,[109] while of the second it is a thing undergone. Since, then, both of these are movements, if they are distinct, what are they in? For either they are both in what is affected and moved, or else the affecting is in what affects and the being affected is in what is affected (if this too must be called an "affecting," then affecting will be homonymous).

Moreover, if this is so, the movement will be in the mover (the same account will apply to the mover and to the thing moved), and so either every mover will be moved,

106. 201^a10–11.
107. 201^a23–25.
108. Retaining καὶ.
109. *Met.* 1050^a21–22.

or, while possessing movement, it will not be moved. If, on the other hand, both the affecting and the being affected are in what is moved and affected, and teaching and learning, which are two things, are in the learner, then first the activation of each will not be in each, and second, and absurdly, [the learner] will be moved with two movements at the same time; for what will be the two alterations of one thing and [tending] toward one form? But that is impossible.

But, then, the activation of each will be one. But [some will say] it is unreasonable for two things that are distinct in form to have one and the same activation. Also, if **202b1** teaching and learning, and affecting and being affected, are the same, then to teach will be the same as to learn, and to affect will be the same as to be affected, so that it will be necessary for the one who is teaching to be in every case learning, and the one that is affecting to be in every case affected.

Or, is it rather that it is not absurd for the activation of one thing to be in another thing—for teaching is the activation of the one who can teach, but occurring in something, and not cut adrift, but of this occurring in that; nor is there anything to prevent the activation of two things from being one and the same (not as the same in being, but in the way that what is potentially is related to what is actively); nor is it necessary for the one who is teaching to be learning, even if affecting and being affected are the same—provided that they are not the same in such a way that one account states the essence of each (as with cape and cloak), but in the way that the road from Thebes to Athens is the same as the road from Athens to Thebes, as was also stated previously?[110] For it is not the case that all the same affections belong to things that are the same in any way whatever, but only to those whose being is the same. Not even if teaching is the same as learning, however, would it be the case that to teach is the same as to learn, just as, not even if two places separated by an interval have one interval between them would it be the case that being separated by the interval from here to there is one and the same as being separated by the interval from there to here. But, speaking in general terms, neither teaching and learning nor affecting and being affected are in the strict sense the same, though what they belong to—the movement—is the same; for being the activation of this occurring in that and being the activation of that by this are distinct in account.

What movement is, then, has been stated, both universally and in particular cases; for it is not unclear how each of its forms will be defined; for alteration, for example, will be the actualization of the alterable, insofar as it is alterable. But to make it still better known: it is the actualization of what is capable of affecting or capable of being affected, insofar as it has that capacity, whether unconditionally or again in a particular case—for example, building or curing. And an account will be given in the same way concerning each of the other sorts of movement.

110. 202a18–20, b9.

3.4
The Unlimited

Since natural science is concerned with magnitudes, movement, and time, each of which must be either limited or unlimited, even if not everything is either limited or unlimited, for example, an affection or a point (for perhaps it is not necessary for any things of this sort to be either of these), it would be appropriate for the person who studies nature to get a theoretical grasp on the unlimited, whether it exists or not, and if it exists, what it is.

A sign that the theoretical investigation concerning the unlimited properly belongs to this science is that all those who are believed to have touched upon this sort of philosophy in a worthwhile way have produced an account of the unlimited, and all of them posit it as some sort of starting-point of the beings.

Some, such as the Pythagoreans and Plato, posit the unlimited as something existing in itself, not as a coincident of something else but as a substance. The difference is that the Pythagoreans say that it exists among the perceptibles (for they do not make number separable), and that what is outside the heaven is unlimited. Plato, by contrast, says that there is no body outside [the heaven], and that not even the Forms are there, because they are not in any place at all, but that the unlimited is present both in the perceptibles and in the Forms.

Also, the Pythagoreans identify the unlimited with the even (for this, they say, entrapped and limited by the odd, gives beings their unlimitedness; a sign of this, they think, is what happens with numbers; for when gnomons are arranged around the one and separately,[111] the form is always a distinct one in the latter case, and the same in the former). Plato, by contrast, has two unlimiteds, the great and the small.[112]

Those concerned with nature, on the other hand, all posit for the unlimited some other sort of nature, distinct from that of the so-called elements—for example, water, air, or what is intermediate between these. Among those who make the elements

111. The one is both odd and even (*Met.* 986ᵃ20). It is represented by ••, when even, and by • (separately) when odd. Enclose • with a gnomon (represented by lines). This gives Fig. A below. Now enclose •• with a gnomon. This gives Fig. B.

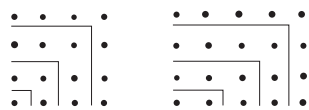

Fig. A Fig. B

In Fig. A, a series of squares (square or even numbers) is generated; in Fig. B, a series of rectangles (rectangular or odd numbers). The successive square or even numbers (2, 4, 6, 8, . . .) generated from • (the one taken as odd) are all the same in form (= n^2). The successive rectangular or odd numbers generated from •• (or the one taken as even) are all distinct in form, since the ratio n:n + 1 is different for all values of n.

112. 206ᵇ27–33.

limited [in number], however, none makes them unlimited [in quantity or extent], while those who make the elements unlimited [in number]—as Anaxagoras does from his homoeomeries, and Democritus from his universal seedbed of shapes—say that the unlimited is continuous by contact.

Anaxagoras says that any part is a mixture in the same way as the universe, because of seeing anything whatever coming to be from anything whatever; for it seems to be on the basis of that, that he also says that once upon a time all things were together (for example, this flesh and this bone), and likewise anything whatever, and therefore all things; and at the same time too; for there is a starting-point of the disaggregation not only in each thing, but also of all. For since what comes to be comes to be from a body of this sort; and since there is a coming to be of everything, although not at the same time; and since there must be some starting-point of the coming to be; and this starting-point is one, and of the sort that he calls "understanding"; and the understanding does its understanding and sets to work from some starting-point; it follows that all things were necessarily together at a certain time and started to be moved at a certain time. Democritus by contrast says that none of the primary things comes to be from another. Nonetheless, the common body is for him a starting-point of all, differing from part to part in magnitude and shape. **203^{b}1**

It is clear from these considerations, then, that the theoretical investigation [concerning the unlimited] is appropriate for natural scientists. It is reasonable too for them all to posit it as a starting-point; for they all think that it does not exist pointlessly and it cannot have any capacity except as a starting-point;[113] for everything is either a starting-point or from a starting-point. Of the unlimited, however, there is no starting-point; for, if there were, it would have a limit. Further, it is incapable both of coming to be and of passing away, as if it were a sort of starting-point; for what is coming to be must reach an end, and there is an end reached in every passing away. That is why, as we say, there is no starting-point of the unlimited, but it is rather the unlimited that seems to be a starting-point of the other things, and to encompass everything, and steer everything (as is said by those[114] who do not posit other causes beyond the unlimited, such as understanding or love), and to be divine; for in fact it is immortal and indestructible, as Anaximander says, and most of the natural scientists.

The conviction that something unlimited exists would seem to result mostly from investigating the following five things: time (for it is unlimited); the division of magnitudes (for mathematicians also make use of the unlimited); further if coming to be and passing away do not run out, it is only because what things coming to be are subtracted from is unlimited; further, what is limited always reaches its limit in relation to something, so that there can be no [ultimate] limit, if one thing must

113. Reading οὔτε γὰρ πάντες μάτην αὐτὸ οἴονται εἶναι.
114. Heraclitus B41 DK, Parmenides B12.3 DK.

always reach its limit in relation to another; and above all, and having most control on the outcome, is a point that produces a puzzle common to all thinkers: because number, mathematical magnitudes, and what is outside the heaven[115] do not in fact run out in thought, they all seem to be unlimited. (And if what is outside is unlimited, it seems that there is an unlimited body and unlimitedly many cosmoses; for why should these be here rather than there in a void?) So, if indeed the body with volume is somewhere, it is everywhere. At the same time, even if there is a void and an unlimited place, there must also be an unlimited body; for in the case of eternal things, there is no difference between being possible and being.

The theoretical investigation concerning the unlimited involves a puzzle; for in fact if we posit that it does not exist, many impossibilities result, as they do if we posit that it does exist. Further, [if it exists], in which of these two ways does it exist—as a substance or as an intrinsic coincident of some nature? Or does it exist in neither of these, yet nonetheless there is an unlimited, or things that are unlimited in number?

What above all belongs to the natural scientist, however, is to investigate whether there is a perceptible magnitude that is unlimited. The first thing, then, is to determine in how many ways things are said to be unlimited. We say so in one way, clearly, when the thing cannot be traversed because it is not in its nature to be traversed (in just the way that voiced sound is invisible); in another, when it admits only of unending traverse, or scarcely admits of traverse, or what—though by its nature it admits of traverse or limit—is not traversed or limited. Further, something may be unlimited with respect to addition, with respect to division, or both.

3.5
Pythagoreans and Platonists on the Unlimited

For the unlimited to be separable from the perceptibles, being itself something unlimited,[116] is not possible. For if the unlimited is neither a magnitude nor a plurality, but is itself a substance and not a coincident, it will be indivisible (for what is divisible is either a magnitude or a plurality); but if it is indivisible, it will not be unlimited except in the way in which voiced sound is invisible. It is not what is unlimited in this way, though, that is said to exist by those who assert that the unlimited exists, or that we are inquiring about, but what is so as untraversable. But if the unlimited is a coincident, it cannot—insofar as it is unlimited—be an element of beings, just as the invisible is not an element of speech, and yet voiced sound is invisible.

Further, how is it possible for some unlimited-itself to exist, if indeed both number and magnitude, of which the unlimited is a certain affection, cannot? For there

115. See 203^a7.

116. I.e., the unlimited cannot be the underlying subject for itself, in the way that the Platonic Form of X is the underlying subject for X (204^a17–18).

is still less necessity [for this in the case of the unlimited] than in the case of number and magnitude.

It is evident too that it is not possible for the unlimited to exist as actively so, and as a substance and a starting-point; for any part whatever of it that might be taken will be unlimited, if it is capable of having parts (for the being for the unlimited and the unlimited-itself were the same, if indeed the unlimited is a substance and not predicated of an underlying subject), so that either it is indivisible or it is divisible into unlimiteds. But for the same thing to be many unlimiteds is impossible (yet just as a part of air will be air, so too a part of the unlimited will be unlimited, if at any rate it is a substance and a starting-point). Therefore, the unlimited must be incapable of having parts and indivisible. But this is impossible for what is unlimited in actuality; for it must be a certain quantity. The unlimited, therefore, belongs [to beings] as a coincident. If that is so, however, it was stated[117] that it is not possible to call it a "starting-point," but rather what it is a coincident of: air or the even. So the view of those who say what the Pythagoreans say is absurd; for they both posit the unlimited as substance and divide it into parts.

But presumably this inquiry would be[118] universal: whether it is possible for there to be an unlimited present also in mathematical objects as well and in intelligible ones that have no magnitude. Our investigation, by contrast, concerns perceptibles and topics our methodical inquiry is concerned with: whether there is or is not present in them a body that is unlimited in increase.

If we investigate the issue logico-linguistically, it would seem from the following considerations that no such body can exist; for if the account of body is what is bounded by planes, there cannot be any unlimited body, whether intelligible or perceptible (nor can there be an unlimited number considered as separate and unlimited; for a number or what has a number is numerable, and so, if the numerable can be enumerated, it would also be possible to traverse the unlimited).

If, on the other hand, we get a theoretical grasp on the issue in a more natural scientific way, [the conclusion is further supported] by the following ones. An unlimited body cannot be either composite or simple [and yet must be one or the other]. It will not be composite, if the elements are limited in number. For there must be more than one element, and the contrary elements must always be equal, and no one of them can be unlimited; for however much one contrary in one body falls short in capacity of another (for example, suppose fire is limited and air is unlimited, and the capacity of a quantity of fire is any multiple whatever of that of an equal quantity of air, with the sole proviso that the multiple is some [finite] number), nonetheless it is evident that the unlimited body will overpower and destroy the limited one. But that each element should be unlimited is impossible; for a body is what has extension in

117. 204a14–17.
118. Reading ἂν εἴη.

all dimensions, while what is unlimited is what has unlimited extension, so that an unlimited body will be unlimitedly extended in all dimensions.

But then neither is it possible for an unlimited body to be one and simple, whether it exists, as some thinkers say, beyond the elements, and is what they generate these from, or simply exists.

For there are some who make this [body] unlimited, and not air or water, in order that the others may not be destroyed by the unlimitedness of air and water; for the elements have a contrariety with each other (for example, air is cold, water wet, fire hot), so if one of them were unlimited, the others would already have been destroyed. But as things stand, they say, there is a distinct thing, from which these come to be. It is impossible, however, for there to be such a thing, not because it is unlimited (for about this topic there is a common statement to be made that applies to all things alike, whether air, water, or anything whatever), but because there is no perceptible body of this sort beyond the so-called elements; for it is what they come to be from that all things are also dissolved into, so that the body in question would have to be here, alongside air, fire, earth, and water. But no such thing is observed.

Nor can fire or any other of the elements be unlimited. For, in general, and apart from whether any of the elements can be unlimited, it is impossible for the universe, even if it is limited, to be or come to be one of them, as Heraclitus says that at some time all things become fire. The same argument applies to the one that the natural scientists put beyond the elements; for everything changes from contrary to contrary—for example, from hot to cold.

{The general question of whether it is possible or impossible for there to be an unlimited perceptible body[119] must be investigated on the basis of the following considerations.}[120]

That it is, in general, impossible, then, for there to be an unlimited perceptible body is clear from the following. It is natural indeed for everything that is perceptible to be somewhere, and there is a certain place for each, and the same place for a part of it and for the whole—for example, for the totality of earth and a single clod, and for fire and a spark. So, if the unlimited perceptible body is uniform, it will be immovable or will always be moving. And yet this is impossible; for why down rather than up or than anywhere else? (I mean, for example, if there is a clod of earth, where will this move or be at rest? For the place of the body that is homogeneous with it is unlimited. Will the clod occupy the whole place, then? And, how? What, then, is its rest or movement, and where? Will it be at rest everywhere? In which case it will not move. Or be moving everywhere? In which case it will not rest.)

On the other hand, if the universe has dissimilar parts, their places will also be dissimilar, and, first, the body of the universe will not be one except by contact, and, second, the parts will be either limited or unlimited in form. But limited they

119. Retaining σῶμα ἄπειρον αἰσθητόν.

120. This sentence should perhaps be secluded.

cannot be; for then those of one sort will be unlimited and those of another will not (if the universe is unlimited)—for example, fire or water will be unlimited, but something like that will be destructive of its contraries, as was stated previously.[121] 25
But if the parts are unlimited and simple, their places are also unlimited, and 29
there will be an unlimited number of elements. But if this is impossible and the 30
places are limited, the universe must be limited too;[122] for it is impossible that place and body should not evenly match; for neither is place as a whole larger than the body can be (and, at the same time, the body would no longer be unlimited), nor is the body larger than the place; for otherwise either a void will exist or a body for which it is natural to be in no place whatever. And it was because of **205^b1**
this that none of the natural scientists made fire or earth the one unlimited body, 25
but either water or air or what is intermediate between them, because each of the former clearly has a definite place, while the others play a double game between up and down.[123]

Anaxagoras for his part speaks in a strange way about the unlimited being at rest; **205^b1**
for he says that the unlimited holds itself fixed, and that this is because it is within itself (for nothing else encompasses it), on the supposition that wherever anything is, it is there by its own nature. But this is not true, because a thing may be somewhere by force and not where it naturally is. So however true it may be that the 5
whole universe is not moved (for what holds itself fixed and is within itself must be immovable), it is still necessary to say why it is not in its nature to be moved. For it is not enough to make this statement and leave it at that; for anything else[124] could be not moving, although nothing in its nature prevents it from doing so. After all, the 10
earth does not spatially move either, and would not do so even if it were unlimited, provided it were still shut in by the center, but would remain at rest at the center,[125] not because there is nowhere it will be moved to, but because it is in its nature to do so. And yet one might say that it holds itself fixed. If, then, this is not the cause [of being at rest], even in the case of the earth, if it were unlimited, but the cause is that it has heaviness, and what has heaviness remains at rest at the center, and the earth is at 15
the center, likewise too the unlimited should remain at rest within itself due to some other cause, and not because it is unlimited and holds itself fixed.

At the same time, it is clear that any part whatever [of the unlimited] would have to remain at rest; for just as the unlimited remains at rest within itself, holding itself fixed, in the same way any part you take will remain at rest within itself; for the places 20
of the whole and of the part are uniform—for example, of the whole earth and of a clod, it is below, and of the totality of fire and a spark, it is above. So, if the place of

121. 204^b28. Retaining καθάπερ εἴρηται πρότερον.
122. Retaining πεπεράνθαι ἀναγκαῖον.
123. I.e., water and air have tendencies to move up (relative to earth) and down (relative to fire). The Bekker text of this paragraph is reorganized as indicated.
124. Reading ὁτιοῦν ἄλλο.
125. Retaining ἐπὶ τοῦ μέσου.

the unlimited is to be within itself, the place of a part will be the same. Therefore, it will remain at rest within itself.

In general, it is evident that it is impossible to say at the same time that there is an unlimited body and that there is some [proper] place for bodies, if every perceptible body has either heaviness or lightness, and, if it is heavy, has a spatial movement that is by nature toward the center, and, if it is light, upward; for this must be true of the unlimited as well. But it is impossible for all of it to have either of these affections or for a half to have one and a half the other; for how will you divide it? And how, of what is unlimited, can there be an above and a below, or an extreme and a center?

Further, every perceptible body is in a place, and the forms and differences of place are up and down, before and behind, and right and left. And these are not merely relative to us or to our position, but are also distinguished within the whole universe itself. But these cannot exist in the unlimited. Simply put, if there cannot be an unlimited place, and every body is in a place, there cannot be an unlimited body. Moreover, what is somewhere is in some place, and what is in a place is somewhere. If, then, the unlimited cannot even be a quantity (for, if it were, it would have to be some particular quantity, such as two or three cubits; for it is these that quantity signifies), in the same way that "in a place" signifies that a thing is somewhere, and this would be up, down, or in some other of the six directions, and each of these is a certain limit.

It is evident from these considerations, then, that there is no actively unlimited body.

3.6
The Way the Unlimited Exists

But if nothing is unconditionally unlimited, it is clear that many impossibilities result. For there will be a start and an end of time, magnitudes will not [always] be divisible into magnitudes, and number will not be unlimited. When the alternatives have been thus determined, and it seems that neither is possible, there is need of an arbitrator, and it is clear that in one way there is something unlimited and in another way there is not.

Things, as we know, are said to *be* either potentially or actually, and what is unlimited is so, on the one hand, by addition and, on the other hand, by division. It was stated,[126] however, that a magnitude is not actually unlimited, although by division it is unlimited; for it is not difficult to refute indivisible lines.[127] So it remains for what is unlimited to be so potentially. But, here, we must not take what is potentially in this way, that if this is potentially a statue, it will also be a statue, and suppose that there will be something actively unlimited.

126. 204ᵃ20–30.

127. *Met.* 992ᵃ19–22. See ††*On Indivisible Lines* 968ᵃ9–14.

Since, though, things are said to *be* in many ways, just as the day exists, and the games exist, because [during them] one thing is always coming to be after another, so it is too with the unlimited (for in the former cases as well there is a potentially and an actively; for the Olympic Games exist both in the sense of the competition's potentially occurring and of its actively occurring), it is clear that the unlimited exists in distinct ways, in the case of time, in the case of humans, and in the case of the division of magnitudes. For, in general, the unlimited exists in the following way, in virtue of one thing always being taken after another, and each thing taken is always limited, but is always, again and again, other. {Further, things are said to *be* in many ways, so that we must not take the unlimited to be a this something, such as a human being or a horse, but in the way that we say that something is a day or a competition, for which the being does not come about as a sort of substance, but always consists in a process of coming to be and passing away: a limited thing [at each stage], yet always one thing followed by another.}[128] Yes, but in magnitudes what was taken remains, while in the case of time and human beings what is taken is destroyed but in such a way that the supply does not give out. **206^b1**

The unlimited by addition is in a way the same as that by division; for, in what is limited, the unlimited by addition[129] occurs in an inverse way; for as it is seen being divided without limit, the same will appear to happen by addition to a definite part. For if in a limited magnitude one takes a definite part, and then were [always] to add another determined by the same ratio [of part to whole] (that is, not taking the same particular quantity of the whole), one will not traverse the limited magnitude. But if one increases the ratio, so that one always takes the same particular magnitude, one will traverse it, because every limited magnitude is exhausted by [taking in this way] any definite magnitude whatever.

In any other way, then, there is not anything unlimited, but in this way there is, potentially and by reduction, and in fact in the way[130] in which we say a day is and a competition is, and potentially in the way that matter is, and not intrinsically in the way that what is limited is.

The unlimited by addition too, then, exists potentially in this way, in the same sort of way, we say, as that by division; for although it will always be possible to take something external to it, it will not exceed every magnitude, in the way in which, in division, it exceeds every definite magnitude, and will always be smaller than it. So to exceed everything by addition is not possible even potentially, if indeed there is nothing that coincidentally is actually unlimited in the way that the natural scientists say that the body outside the cosmos, of which the substance is air or some other such thing, is unlimited. But if there cannot be in this way a perceptible body that is actually unlimited, it is evident that there cannot be one that is even potentially unlimited

128. This sentence should perhaps be secluded.
129. Reading τὸ κατὰ πρόσθεσιν.
130. Reading καὶ δὲ ἔστιν.

by addition, except, as was stated,[131] in an inverse way to being so by division. (It is because of this in fact that Plato posited two unlimiteds,[132] because there seems to be an excess and a going on without limit both in increase and in decrease. But though he posits two, he does not use them; for in numbers the unlimited in decrease is not present, because the unit is the smallest one, and the unlimited in increase is not present either, because he posits numbers only up to ten.[133])

It turns out, then, that the unlimited is the contrary of what people say it is. For it is not what nothing is outside of, but rather what something is always outside of, that **207[a]1** is unlimited. A sign of this is that people say that rings without a socket for a gemstone are unlimited, because it is always possible to take something that is outside. But they say this in virtue of a certain similarity, and not using the term in the strict sense; for this must hold and also the same thing must never be taken again. In the case of the circle, though, it does not happen that way, but only that the next thing is always a distinct one. Something is unlimited, then, of which—when we are taking quantities—it is always possible to take something that is outside. On the other hand, what nothing is outside of is complete and whole; for this is how we define what is whole, as that from which nothing is absent—for example, a whole human being or a whole box. And just as with the particular case, so too with what is whole in the strict sense: the whole is what nothing is outside of. But what there is something absent from and outside of is not an all, whatever it may be absent.[134] Whole and complete are either altogether the same or very close in nature.[135] Nothing is complete (*teleion*) that has no end (*telos*), and the end is a limit.

That is why Parmenides must be thought to have spoken better than Melissus; for Melissus says that the unlimited is a whole, Parmenides that the whole is limited, "equal in all directions from the middle."[136] For to connect the unlimited to the universe or whole is not a question of tying string to string, since it is from this that they get the dignity that they ascribe to the unlimited, that it encompasses all things and contains the universe within itself, because it has some similarity to the whole.

For the unlimited is the matter of the completeness of a magnitude,[137] and is what is potentially but not actually a whole, since it is divisible by reduction and by its inverse, addition; is a whole and limited not intrinsically but with regard to something else; and does not encompass but, insofar as it is unlimited, is encompassed. That is why the unlimited, insofar as it is such, is unknowable; for the matter has no form. So it is evident that the unlimited is found more in an account of a part than

131. 206[b]3–12.
132. I.e., the great and the small (203[a]15–16).
133. *Met.* 1073[a]18–21.
134. I.e., regardless of how small it is.
135. *Met.* 1021[b]12–14, 1023[b]26–27.
136. B8.44 DK.
137. I.e., the form of whatever magnitude it is the matter of.

in that of a whole; for the matter is a part of the whole, just as the bronze is of the bronze statue, since, if indeed the unlimited encompasses in the case of perceptibles, then, in the case of intelligible objects too, the great and the small should encompass the intelligible objects.[138] But it is absurd and impossible that the unknowable and indefinite should encompass and define.

3.7
The Various Sorts of Unlimited; Matter

It is in accord with reason too that there does not seem to be any unlimited by addition that is such as to exceed every magnitude, while there does seem to be one by division (for the unlimited, as the matter,[139] is what is encompassed and inside, while the form is what encompasses). It is also reasonable that while in number there **207^{b}1** is a limit in the direction of the least, though in the direction of the greater every magnitude is always exceeded, yet in the case of magnitudes, on the contrary, while any magnitude is exceeded in the direction of the less, in the direction of the greater there is no unlimited magnitude. The cause is that what is one is indivisible, whatever may be one (for example, a human being is one human being and not many), while number is a plurality of ones—a certain many of them. So there must be a stop at the indivisible (for "two" and "three" are paronymous names, and similarly with each of the other numbers). In the direction of the greater, however, it is always possible to think of [a greater number]; for the bisections of a magnitude are unlimited. So the unlimited exists potentially, not actively, although what is grasped always exceeds any definite plurality. But this number is not separable from the process of bisection,[140] and the unlimited does not stand fast but comes to be, just like time and the number of time.[141]

In the case of magnitudes, on the other hand, the contrary holds; for the continuous is divisible into unlimited parts, while there is no unlimited in the direction of the greater. For whatever size a [perceptible] magnitude can be potentially, it can also be actively. So, since no perceptible magnitude is unlimited, it is impossible to exceed every definite magnitude—for then there would be something greater than the heaven.

The unlimited is not the same thing in magnitude, in movement, and in time, as if it were some one nature. Rather, the posterior among these is said to be unlimited with reference to the prior—as, for example, a movement is said to be unlimited in

138. Yet Plato posits the great and the small as the material element, and the one as the formal element, from which the Forms on the one hand and the perceptibles on the other are generated. See *Met.* $987^{b}20–21$, $988^{a}10–14$.
139. Reading ὡς ἡ ὕλη.
140. Reading τῆς διχοτομίας.
141. $206^{b}1–2$.

virtue of the fact that the magnitude, the vehicle of movement, is altered or increased, and the time because of the movement. For now let us make use of these notions, but later[142] we will state what each of them is and why every magnitude is divisible into magnitudes.

But our account does not deprive the mathematicians of their theoretical investigation either, in thus doing away with the existence of an unlimited that is actively untraversable in the direction of increase; for even as things stand they do not need the unlimited (for they make no use of it), but only that there should be a limited line of whatever length they wish. But another magnitude of any size you like can be divided in the same ratio as the greatest one can, so that, as regards proof at least, it makes no difference to them that its being among the magnitudes that actually exist is not necessary.[143]

Since there is a fourfold division of causes, it is evident that the unlimited is a cause as matter, and that the being for it is privation, while the intrinsically underlying subject is what is continuous and perceptible. All the other thinkers as well manifestly make use of the unlimited as matter. That is why it is absurd to make it what encompasses and not what is encompassed.

3.8
Refutation of Arguments for the Actually Unlimited

It remains to go through the arguments[144] that seem to support the view that the unlimited exists not only potentially but as something definite; for some of them are not necessities, while others admit of other true replies.[145]

In order that coming to be should not run out, it is not necessary for there to be a perceptible body that is actively unlimited; for it is possible for the passing away of one thing to be the coming to be of another, the universe being limited.

Further, making contact and being limited are distinct. For the former is a relative, that is, it is making contact with something (for everything that makes contact makes contact with something), and is a coincident of some limited things. But what is limited is not a relative. Nor is it possible for any random thing to make contact with any random thing.

It is absurd to put your trust in thought; for then the excess and deficiency are not in the thing but in thought. For one might think of each of us as being many times as large as himself, increasing our size without limit; but it is not because of this, that

142. 5.1–2, 4.
143. Reading μεγέθεσιν οὐδέν ἐστιν ἀναγκαῖον.
144. 203b15–30.
145. I.e., some objections will be to the deductive validity of the arguments to be examined, others to their soundness, or the truth of their premises.

someone thinks it is so, that anyone exceeds the size of his city (*astu*)[146] or the size that we have, but because it is the case; that someone thought it is so is coincidental.

Time, movement, and thought are unlimited things, in that what is taken does not remain.

Magnitude is not unlimited, either by way of reduction or by way of increase, in thought.

In what way the unlimited exists, then, in what way it does not exist, and what it is has now been stated.

BOOK 4

4.1
The Existence of Place

It is likewise necessary for a natural scientist to know about place too, just as about the unlimited, whether it exists or not, what way it exists, and what it is. For everyone supposes that the beings are somewhere (for a non-being is nowhere; for where is a goat-stag or a sphinx?), and movement in the most common and strictest sense, which we call "spatial movement," is movement with respect to place.

The question of what exactly place is, however, involves many puzzles; for it does not appear to be the same thing to those who get a theoretical grasp on it based on all the facts [as to those who do not]. Further, we have nothing from previous thinkers either by way of going through the puzzles about it or of making us puzzle-free. **$208^{b}1$**

That place exists seems to be clear from replacement; for where there is now water, there, when the water has gone out as from a vessel, air is in turn present. Then[147] some other bodies occupy this same place. The latter, then, seems to be something distinct from all the things that come to be in it and change; for what air is in now, water was previously in, so that it is clear that the place, that is, the space into which they entered and from which they left, was something distinct from either of them.

Further, the spatial movements of the simple natural bodies—for example, fire, earth, and the like—make it clear not only that place is something but also that it has a certain capacity. For each spatially moves to its own place if it is not prevented, fire up above, earth down below. These are the parts and forms of place—up and down and the rest of the six directions. And these—up and down, right and left—are not just relative to us; for in relation to us they are not always the same, but come to be in accord with our position, depending on how we are turned. That is why left and right are often the same, as are up and down, and before and behind. In nature, by contrast, each is distinct and separate. For up above is not some random thing, but

146. Retaining τοῦ ἄστεός.
147. Reading ὅτε.

where fire and what is light spatially move to. Similarly, down below is not some random thing, but where what has heaviness and what is earthen spatially move to, as differing not in position alone but in capacity as well. (Mathematical objects also make this clear; for though they are not in a place, nonetheless they have a right and left in accord with their position relative to us, in the sense in which these are said of things merely because of their position, and not in the sense of having either of them by nature.) Further, those who say that a void exists say that place does; for a void would be a place lacking body.

It is through these considerations, then, that one might take place to be something beyond bodies, and all perceptible bodies to be in a place. And even Hesiod might seem to be speaking correctly in making chaos come first. At any rate, he says, "Of all things the very first that came to be was chaos, and then broad-breasted earth,"[148] on the supposition that there needs first to be a space for the beings, because he believed, as most people do, that everything is somewhere and in a place. If this is so, however, then the capacity of place must be a wonderful one and prior to all things; for that without which nothing else can exist, while it can exist without the others, must be first; for place is not destroyed when the things in it pass away.

Nonetheless, there is still a puzzle, if place exists, as to what it is, whether some sort of volume for body, or some other sort of nature; for we must first inquire about what its kind is.

A place, then, has three dimensions, length, breadth, and depth, by which every body is bounded. Yet it is impossible for place to be a body; for then there would be two bodies in the same place.

Further, if indeed a body has a place and a space, it is clear that the surface and the rest of a body's limits do as well; for the same argument will apply; for where previously the surfaces of the water were, there those of the air in turn will be. But we have no way to distinguish between a point and the place of a point. So, if the place of a point is not distinct from it, neither will that of any of the others be, and nor will place be something beyond each of these.

What exactly, then, are we to suppose place to be? For if it has a nature of the sort that was mentioned, it cannot be an element or composed of elements, whether of corporeal or of incorporeal ones; for while it has magnitude, it has no body. The elements of perceptible bodies,[149] by contrast, are bodies, while from intelligible objects no magnitude comes to be.

Further, of what in beings could one suppose place to be the cause? For none of the four causes is present in it; for it is neither a cause as matter for the beings (for nothing is composed of it), nor as form and account of things, nor as end, nor does it cause the beings to move.

148. *Theogony* 116–117.

149. Reading τῶν αἰσθητῶν σωμάτων.

Further, if it is itself one of the beings, it will be somewhere. For Zeno's puzzle demands some argument [in response];[150] for if every being is in a place, it is clear that there will be a place of place too, and so on without limit.

Further, just as every body is in a place, so too in every place there is a body, so what are we to say about things that increase in size? For from what has been said it must be that their place increases along with them, if each of their places is neither smaller nor larger than they are.

Due to these things, then, it is necessary to puzzle over not only what place is, but also whether it exists.

4.2
Is Place Matter or Form?

Since some things are said to be something intrinsically, others in virtue of another thing, and place may be either the common place in which all bodies are, or the special one, which a given body is in first (I mean, for example, that you are now in the heaven because you are in the air and it is in the heaven, and you are in the air because you are on the earth, and similarly you are on it because you are in this place, which encompasses nothing more than you), then, if place is the first thing encompassing each body, it would be a certain limit. So place would seem to be the form and the shape of each body, by which the magnitude, and the matter of the magnitude, are bounded; for this is what the limit of each is. If one investigates it in this way, then, place is the form of each thing. But insofar as place seems to be the extended space of the magnitude, it is the matter; for this is distinct from the magnitude: it is what is encompassed and bounded by the form, as by a surface, that is, a limit. And this is the sort of thing that the matter and the indefinite are; for when the limit and the affections of a sphere are subtracted, nothing is left beyond the matter.

That is why Plato too says in the *Timaeus*[151] that matter and space are the same thing; for what makes participation possible and space are one and the same. Although he spoke of what makes participation possible in another way in the so-called unwritten doctrines, nonetheless he still declared that place and space were the same thing. In fact, while everyone says that place is something, he alone tried to say what it is.

It makes perfect sense, then, that when we investigate the question on the basis of these considerations it seems difficult to know what place is, if indeed it is one or the other of these two things, either matter or form. In any case, not only do these in fact involve theoretical knowledge of the highest sort,[152] but it is not easy to know them in separation from each other.

150. $212^{b}27–29$.
151. 51a–b with 52a8, b4.
152. *Met.* $1003^{a}26$.

But surely it is not difficult to see at least that it is impossible for place to be either of them. For the form and the matter are not separate from the thing, while the place admits of being so; for what air was in, water in turn comes to be in, as we said,[153] when the water and the air replace each other, and similarly when other bodies do. So the place of each thing is neither a part nor a state of it, but is separable from it. For in fact place seems to be something like a vessel (for a vessel is a transportable place). The vessel, though, is nothing belonging to the thing. Insofar, then, as it is separable from the thing, place is not the form; and insofar as it encompasses, it is distinct from the matter. Also, what is somewhere always seems both itself to be something and to have some distinct thing outside it. (Plato must tell us, then, if we may make a parenthetical comment, why the Forms and the numbers are not in a place, if indeed place is what makes participation possible, whether what makes participation possible is the great and the small or matter, as he wrote in the *Timaeus*.[154])

Further, how could a thing spatially move to its own place, if the place is the matter or the form? For it is impossible for what there is no movement of and no up and down to be place. So place must be sought among things that are of this sort. And if place is in the thing itself, as it must be if indeed it is either shape or matter, place will be in a place; for both the form and the indefinite change and are moved at the same time as the thing, and are not always in the same place, but are just where the thing is. So there will be a place of the place.

Further, when water comes to be from air, the place has been destroyed, for the body that comes to be is not in the same place. Of what sort, then, is this passing away?

On the basis of these considerations, then, that it is necessary for place to be something, and, again on their basis, that puzzles might be raised as to what its substance is, has now been stated.

4.3
Can a Thing Be in Itself or a Place in a Place?

We must next get a grasp on how many ways one thing is said to be *in* another. One way, then, is as the finger is in the hand, and, in general, as the part in the whole. Another, as the whole is in the parts; for the whole does not exist beyond the parts. Another way, as human is in animal, and, in general, form in kind. Another, as the kind is in the form, and, in general, the part of the form in the account. Further, as health is in hot and cold things, and, in general, the form in the matter. Further, as the affairs of the Greeks are in the king,[155] meaning, in general, in the first thing capable of causing movement. Further,

153. 208ᵇ1–8.
154. An apparent misunderstanding of 51a–b.
155. In the sense of being in his hands.

as in the good, and, in general, as in the end (that is, the for-the-sake-of-which). In the strictest way of all, as a thing is in a vessel, and, in general, in a place.

One might also raise a puzzle as to whether a thing can possibly be in itself, or nothing can, but rather everything is either nowhere or in something else. And this in two ways, either intrinsically or in virtue of something else. For when what is in something and what it is in are parts of the whole, the whole will be said to be in itself; for things are also said to be what they are with reference to their parts—for example, a human being is said to be pale, because his surface is pale, or to know science because his rationally calculative part does. The jar, then, will not be in itself, nor will the wine, but the jar of wine will be; for the thing that is in something and the thing it is in are both parts of the same thing.

In this way, then, it is possible for a thing to be in itself, but in the primary way it is not possible. For example, the pale is in a body (for the surface is in a body), and the scientific knowledge in a soul, and [the human being] is called what it is with reference to these, which are parts, at any rate when considered as in a human being (but the jar and the wine are not parts when separate, but are when together; that is why, when they are parts, the thing will be in itself)—for example, the pale is in a human being because it is in a body, and it is in a body because it is in a surface, but it is not any longer in a surface in virtue of something else. And these things—the surface and the pale—are at least distinct in form, and each has a distinct nature and capacity. **210^b1**

When we investigate inductively, then, we do not see anything being in itself in any of the ways distinguished, and when we do so by argument it is clear that it is impossible; for each of the two things would have to be both of them—for example, the jar would have to be both the vessel and the wine, and the wine both the wine and the jar, if indeed it is possible for a thing to be in itself. So however much they may be in each other, the jar will still be receptive of the wine not insofar as the jar is itself wine but insofar as it is a jar, and the wine will be in the jar not insofar as it is itself a jar but insofar as it is wine. It is clear, then, that with respect to their being they are distinct; for the account of the thing something is in is distinct from the account of the thing that is in it. Moreover, it is not possible coincidentally either; for then two things will be in the same [place] at the same time; for the jar will be in itself, if a thing whose nature is receptive can be in itself, and further, what it is receptive of—for example, if wine, then wine—will be in it.

It is clear, then, that it is impossible for something to be in itself in the primary way.

Zeno's puzzle, that if place is something, it will be in something, is not difficult to resolve; for there is nothing to prevent the first place from being in something else, although not in the way in which the thing is in that place, but rather in the way in which health is in hot things as a state, or in which the hot is in the body as an affection. So it is not necessary to go on without limit.

In the other case, it is evident that since the vessel is nothing belonging to what is in it (for in the primary way what [something is in] and what is in it are distinct),

place will not be either the matter or the form, but something else. For these—both
30 the matter and the shape—are something belonging to what is in a place.

Let this, then, serve as going through the puzzles.

4.4
What Place Is

What exactly place is should become evident from what follows. Let us assume about it, then, all the things that truly seem to belong intrinsically to it. We think, then, that place is the first thing encompassing that of which it is the place, and is nothing
211ᵃ1 belonging to the thing; further, that the primary place is neither less nor greater than the thing; further, that it can be left behind by the thing and is separable from it; in addition, that every place has an up and down; that each body should by nature
5 spatially move to and remain in its proper place, and does this either upward or downward.[156] With these as hypotheses, then, we must get a theoretical grasp on the rest. And we must try to make our investigation in such a way that the what-it-is is given an account of, so that the puzzles are resolved, the things that are believed to belong to place will in fact belong to it, and further, so that the cause of the difficulty
10 and of the puzzles concerning it will be evident; for this is the best way of proving each thing.

First, then, it must be understood that place would not be a subject of inquiry, if movement with respect to place did not exist; for it is most of all because of this that we think that even the heaven is in a place, because it is always in movement. Of movement with respect to place, one sort is spatial movement, the other increase and
15 decrease; for in increase and decrease too something changes, and what previously was there changes its place in turn into a larger or smaller one. And what is moved actively is so either intrinsically or coincidentally. And what is moved coincidentally is either what admits intrinsically of being moved—for example, the parts of the
20 body and the nail in the ship; or what do not admit of it, but instead are always moved coincidentally—for example, paleness and scientific knowledge; for these change their place in this way: because what they are present in changes its place.

We say that something is in the heaven as being in a place, because it is in the air,
25 and the air is in the heaven. And it is in the air, though not in all of it. But, because the innermost extremity of the air encompasses the thing, we say that it is in the air (for if all the air were its place, the place of a given thing would not be equal to the thing; but it certainly seems to be equal, and this primary place in which it is, is of this sort). When, then, what encompasses a thing is not divided from it but contin-
30 uous with it, the latter is said to be in the former not as in a place, but as the part is in the whole. On the other hand, when what encompasses a thing is divided from it

156. For the sake of simplicity the other four directions and the other proper places are ignored.

and makes contact with it, the latter is in its first [place] in the [innermost] extremity of the former, which is neither a part of what is in it, nor greater than its extended space, but equal to it; for the extremities of things that are making contact are in the same place. And if it is continuous with what encompasses it, it is moved not in it but with it; while if it is divided, it is moved in it, and whether what encompasses it is moved or not makes no difference.

{Further, when it is not divided from what encompasses it, it is said to be in it as a part of a whole, as the pupil in the eye, or the hand in the body, while when it is divided, as the water in the vessel or the wine in the jar; for the hand is moved with the body, while the water is moved in the vessel.}[157] **211^{b}1**

It is already evident from these considerations what place is. For there are pretty much four things of which place must be one: shape, matter, a certain extended space (the one in between the extremities), or the extremities, if there is no extended space beyond the magnitude of the body that comes to be in it. But it is evident that it cannot possibly be three of these.

It is because it encompasses something that place seems to be shape; for the extremities of what encompasses something and of what it encompasses are in the same place. But though they are both limits, they are not limits of the same thing. On the contrary, the form is that of the thing, while the place is that of the encompassing body.

Because the thing encompassed and divided from what encompasses it often changes, however, while the latter remains unchanged, like water poured from a vessel, what is in between seems to be a certain extended space, on the supposition that the latter is something beyond the body that changes its place. But that is not so. Instead, a random body, among those naturally capable of changing place and of making contact with others, enters it. And if there were a certain extended space that naturally remained unchanged,[158] then there would be an unlimited number of places in the same place (for when the water and the air change places, all the parts will do the same thing in the whole as all the water in the vessel does). At the same time the place too will be undergoing change, so that there will be another place of the place, and many places will be together. But the place of the part, in which it moves when the whole vessel changes places, is not a distinct one; rather, it is the same one; for it is in the place in which they are that the air and the water (or the parts of the water) change places. But this does not hold true regarding the place in which they come to be, which is part of the place that is the place of the whole heaven.[159]

157. Secluded as a dittograph of 211^{a}29–36.

158. Reading εἰ δ' ἦν τι διάστημα τὸ πεφυκὸς καὶ μένον, ἐν τῷ αὐτῷ τόπῳ.

159. Suppose that P_1 is a place that is part of P, which is the place inside PV_1, which is the proper place of a vessel V. When V moves from PV_1 to another proper place PV_2, the place within which P_1 moves does not change, but continues to be P. If P_1 were an intrinsic being, however, with a proper place of its own, this would not be true. Instead P_1 would move from a proper place inside PV_1 to one inside PV_2.

The matter too might seem to be place, if at any rate one investigated something at rest and not separated but continuous. For just as, if a thing undergoes alteration, there is something that now is pale but once was dark, or now is hard but once was soft, which is why we say that matter is something, so too place seems to exist because of a phenomenon of this sort—except that in the former case it is because what was air is now water, while place is thought to exist because where there was air, there is now water. But the matter, as was said in the previous discussions,[160] is neither separable from the thing nor encompasses it, while place is or does both.

Therefore, if place is none of the three, neither the form, the matter, nor some extended space which is always there, distinct from and beyond the extension of the thing that changes its place, it must be that place is the remaining one of the four, the limit of the encompassing body at which it is in contact with what is encompassed. (By "what is encompassed" I mean a body that can be moved by way of spatial movement.)

Place seems to be something important and difficult to grasp, both because the matter and the form appear alongside it and because the change of place of the moving body occurs within an encompassing body that is at rest; for it seems possible that there is an extended space in between that is something distinct from the magnitudes that move. And air contributes something to the belief by seeming to be incorporeal; for it is not only the limits of the vessel that appear to be a place, but also what is in between them, which is regarded as being void. And just as a vessel is a place that can be carried around, so a place is a vessel that cannot be moved. That is why, when something moves and changes inside something that is in movement (for example, a boat in a river), the thing that encompasses it serves more as a vessel than a place. But a place is meant to be immovable; that is why it is more the whole river that is the place, because as a whole it is immovable.[161] So the first immovable limit of what encompasses the thing—this is [its] place.

And this why the center of the heaven and the extreme limit (relative to us) of its circular spatial movement seem to everyone to be most of all up and down in the strict sense, because the center always remains at rest, and the ultimate limit of the circle remains as it was. So, since what is light is what by nature spatially moves upward, and what is heavy is what by nature spatially moves downward, the encompassing limit in the direction of the center is down, as is the center itself, while the one in the direction of the extremity is up, as is the extremity itself. And it is because of this that place is thought to be a sort of surface, and like a vessel and something that encompasses a thing. Further, place is together with the thing; for the limits are together with what is limited.

160. 209^b23, 207^a35.

161. X is moving inside a boat Y that is moving on river Z. In relation to X, Y serves more as a vessel than a place, since Y is moving, and places cannot move. In what place, then, is X moving? It is Z, which regarded as such is, like all places, immovable.

4.5
Puzzles about Place Solved

A body, then, that has some outside body encompassing it is in a place, while one that hasn't is not. That is why, even if something of the latter sort were to be water, its parts will be moved (for they encompass each other), while the universe will in one way move and in another not. For considered as a whole it does not at one and the same time change its place, though it will be moved in a circle—for the whole is the place of the parts—and some of these are moved not upward and downward but in a circle, others upward and downward, namely, those that admit of condensation and rarefaction.

As was said,[162] though, some things are potentially in a place, others actively. That is why, when a uniform thing is continuous, the parts are potentially in a place, while when they are separated and yet in contact, as in a heap, they are actively so.

Also, some things are intrinsically in a place (for example, every body that is movable either by way of spatial movement or by way of increase is intrinsically somewhere; but the heaven, as was said,[163] is not anywhere as a whole, nor in any place, if at any rate no body encompasses it; yet as it is moved,[164] it is in fact a place for its parts; for they are in contact with each other).

Other things, by contrast, are coincidentally in a place—for example, the soul and the heaven; for the parts [of the heaven] are all in a way in a place, as one encompasses another on the circle. That is why what is up above is moved in a circle, though the universe is not anywhere. For what is somewhere is both itself something, and further, there must be something else beyond it that it is in—what encompasses it. But beyond the universe and the whole there is nothing that is outside the universe, and that is why everything is within the universe; for the heaven, presumably, is the universe. Yet their place is not the heaven, but a part of the heaven, which is an extreme one and one that makes contact with the movable body. That is why the earth is in the water, the water in the air, the air in the ether, and the ether in the heaven, while the heaven is no longer in anything else.

It is evident from these considerations that all the puzzles[165] will also be resolved if we speak of place in the foregoing way. For it is not necessary for the place to increase along with the thing in it, or for a point to have a place, or for two bodies to be in the same place, or for place to be some corporeal extension (for what is between [the limits] of the place is whatever random body it may be, not the extension characteristic of a body). Also, place too is somewhere, although not as in a place, but in the

35 **$212^{b}1$**

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162. $211^{a}17$–$^{b}5$.
163. $212^{a}32$.
164. Reading ἐφ' ὃ.
165. Stated at $209^{a}2$–30.

way that a limit is in what is limited. For not every being is in a place, but [only] movable body.

Also, it is reasonable, then, that each [movable body] moves to its own place (for what is adjacent to something and not by force in contact with it is of the same kind as it; and if they are naturally unified, they cannot affect each other,[166] while if they are [only] in contact, one is affected and the other affects it). Also, that each should by nature remain in its proper place is not unreasonable; for the part does too—what is in a place is like a detached part in relation to the whole, as when one causes movement in a part of water or of air. It is in this way too that air is related to water; for the one is, as it were, matter, the other form—water being the matter for air, while air is, as it were, a sort of activation of water; for water is potentially air, while air is potentially water in another way. (We must, however, make determinations about these topics later,[167] although it is necessary, because the occasion calls for it, to say what we have said; what has now been stated in a non-perspicuous way will then be stated in a more perspicuous one.) If, then, the same thing is matter and actuality (in fact, water is both, but one potentially and the other actually), it will be somehow as a part is related to the whole. That is why these things have contact, and are naturally unified, when they both become actively one.

Also, as regard place, both that it is and what it is, has now been stated.

4.6
Views about the Void

In the same way, we must suppose that it belongs to the natural scientist to get a theoretical grasp on the void as well, as to whether it exists or not, in what way it exists, and what it is, just as in the case of place; for in fact conviction and lack of conviction are much the same in the two cases, because of what people assume; for those who speak of the void as existing suppose it to be, as it were, a sort of place or vessel, which seems to be a plenum when it contains the volume it is capable of receiving, and void when it lacks it, on the supposition that void, plenum, and place are the same thing, although the being for them is not the same.

We must start the investigation, however, by grasping what is said by those who assert that a void exists, then what is said by those who deny that it does, and third the common beliefs about these issues.

Those, then, who try to prove that a void does not exist in fact refute not what people mean by "void," but what they themselves say[168] in error about it, as Anaxagoras does and those who try to refute it in this way. For they prove that air is

166. *Met.* 1046ᵃ22–29.
167. *GC* 1.3, *Mete.* 4.1–2.
168. Rejecting the addition of ὃ.

something, by twisting wineskins and proving how strong the air is, and by trapping it in clepsydras.

But what people mean by "void" is an extended space in which there is no perceptible body. They, however, thinking that all being consists of bodies, say that what there is nothing at all in is void, because what is full of air is void. But it is not this that needs to be proved, that air is something, but that there is no extended space, either separable or actively existing, that is distinct from bodies, and that divides the totality of body so that it is not continuous (as Democritus, Leucippus, and many other of the natural scientists say), or is perhaps even outside the totality of body, which is continuous. **213b1**

These thinkers, then, do not meet the problem head on, but rather those who say that a void does exist. And they say, for one thing, that there would be no movement with respect to place (that is, spatial movement and increase); for [they say that] there would not seem to be movement, if there were no void; for a plenum cannot be receptive of anything. If it were to be receptive of something, and there were two things in the same place, it would be possible for any number of bodies whatever to be together; for one cannot say what difference in number would cause what is stated not to hold. But if this is possible, then the smallest thing will be receptive of the greatest; for a great thing is many small ones. So, if it is possible that many equal things should be in the same place, it is also possible that many unequal things should be. (Melissus even proves on the basis of these considerations that the universe is immovable; for if it is to be moved, there must (he says) be a void, but a void is not among the beings.) One way, then, in which they prove that there is a void is on the basis of these considerations.

Another is from the fact that some things are seen to contract and be compressed—for example, they even say that wine-jars will be receptive of the wine along with the wineskins, on the supposition that the condensed body contracts into the voids within itself.[169]

Further, increase too seems to all of them to occur by means of a void; for nourishment is a body, and it is impossible for two bodies to be together [in exactly the same place].

They also produce as evidence the [vessel] that surrounds ashes, which is receptive of as much water as the empty vessel.[170]

The Pythagoreans too said that a void exists, and that it enters the heaven itself from the unlimited breath, as the heaven is also inhaling the void that distinguishes the natures of things, since it is what separates and distinguishes the successive things in the series. This happens first in the case of the numbers; for the void distinguishes their nature.

169. Wine consists of atoms and voids. When it is poured from wineskins into wine-jars, it is compacted by the greater mass of wine in the wine-jar, so that previous voids are now filled with atoms.

170. Because there are many empty spaces in ash.

The grounds, then, on which people say that there is, or that there is not, a void are pretty much these and this many.

4.7
What a Void Is; Refutation of Arguments for the Existence of a Void

As a step toward determining which of these two alternatives holds, we need to grasp
30 what the name void signifies. A void, then, seems to be a place in which there is nothing. The cause of this is that people think that to be is to be a body, that every body is in a place, and that a void is a place in which there is no body, so that if there is no body somewhere, then there is nothing there. Moreover, they think that every body
214a1 is tangible, and that whatever has heaviness or lightness is of this sort. It follows by deduction, then, that a void is what there is nothing heavy or light in. These things, then, as we said previously, follow by deduction. It is absurd, then, to ask whether a point is a void; for a void must be a place within which there is an extended space
5 for a tangible body.

But, in any case, it appears that something is said to be a void in one way when it is not filled with a body that is perceptible by touch. (What is perceptible by touch is whatever has heaviness and[171] lightness. That is why someone might raise a puzzle as to what people would say if the extended space contained a color or a sound—is
10 it a void or not? Or is it clear that [they would respond that] if it were receptive of tangible body, it would be a void, and if not, not?) In another way, something is said to be a void when there is not a this something in it, nor a corporeal substance. That is why some people say that a void is the matter of a body (and they say that the place too is this same thing), but they do not speak correctly; for the matter is not
15 separable from the things, but they are inquiring about the void on the supposition that it is separable.

Since we have discussed place,[172] and void must, if it exists, be place lacking body, and it was stated in what way place exists and in what way it does not, it is thus evident that a void does not exist, whether separated or non-separated. For a void is
20 meant to be not a body but rather an extended space for a body. That is also why a void too seems to be something, because place is, and because of the same considerations. For certainly movement with respect to place comes to the aid both of those who say that a place is something beyond bodies that come to occupy it and of those who say the same about a void. They think that a void is a cause of movement in the sense of being what movement takes place in, and this would be the sort of thing that
25 some people say place is.

171. Reading καὶ.
172. 4.1–5.

But there is no necessity whatever, if movement exists, for there to be a void. In general, as regards all movement, it is not necessary in the least, due to something that Melissus also overlooked, that it is possible for a plenum to undergo alteration. But then it is not necessary for movement with respect to place either; for it is possible for things to make way for each other all at once, even though there is no separated extended space beyond the moving bodies. And this is clear in the rotations of continuous things, just as it is too in those of liquids.

Also, it is possible for things to be condensed not into a void but through the squeezing out of what is contained in them (for example, the air inside when water is condensed), and for it to increase not only by the entry of something else, but also by undergoing alteration—for example, when air comes to be from water.[173]

In general, both the argument about increase and about the water poured on the ashes are self-impeding. For either not any and every part increases, or it does so not by [the addition of] a body, or it is possible for two bodies to be in the same place, or it is necessary for the whole body to be a void, if it increases at every point and increases by means of a void. They are requiring that we resolve a puzzle common to both sides,[174] then, not proving that a void exists. The same argument applies to the ashes as well.

It is evident, then, that it is easy to resolve the puzzles on the basis of which they prove that a void exists.

4.8
No Void Separate from Bodies, or Occupied by a Body

Let us go back to saying that no separated void exists in the way in which some people say it does. For if each of the simple bodies has by nature a certain spatial movement (for example, fire upward and earth downward, that is, toward the center), it is clear that a void would not be the cause of their spatial movement. Of what, then, will a void be a cause? For it is thought to be a cause of movement with respect to place, but is not a cause of this.

Further, if when a void exists there is something like a place lacking a body, where will a body placed in it spatially move to? For it certainly cannot be to all of it. The same argument applies as to those who think that place is something separated that things spatially move to; for how will what is placed in it spatially move? Or will it remain at rest? And it makes perfect sense that the same argument fits both in the cases of the up and the down and also in the case of a void; for those who say that a void exists make it a place.

173. *GC* $321^{a}9$–29.
174. To account for the phenomenon of increase in size (*GC* $321^{a}2$–$322^{a}33$).

Also, in what way will something be in either a [separated] place or a void? For it does not result [as the defenders of the void suppose] when some whole is put in a separated place or in some body[175] that remains; for a part of it, if not put in separately, will not be in a place but in the whole body.[176] Further, if a [separated] place does not exist, neither will a void.

As for those who say that it is necessary for a void to exist if indeed there is to be movement, what results turns out to be the contrary, if one investigates the issue, that it is not possible for anything at all to move if a void does exist.

For just as some people say that the earth is at rest because of the sameness [of what surrounds it], so in a void too it is necessary [for the bodies] to be at rest; for there is nowhere for them to move to more or less [than to any other direction]; for a void, insofar as it is a void, admits of no differentiation.

215a1 Again, every movement is either by force or in accord with nature. And if there is the sort that is by force, there must also be the sort that is in accord with nature (for the sort that is by force is contrary to nature, and the sort that is contrary to nature is posterior to the sort that is in accord with nature). So, if each of the natural bodies does not have a natural movement, they will not have any of the other movements either. But how can there be movement that is by nature, if there is no differentiation throughout the void and the unlimited? For insofar as it is unlimited, there will be no up, down, or center, and, insofar as it is a void, up will be no different from down (for just as there is no differentiation of non-being, so neither is there any of the void; for a void seems to be a non-being and a privation). But spatial movement that is by nature is differentiated, so that there will be differences by nature. Either, then, nothing whatever has any spatial movement that is by nature, or, if there is spatial movement, there is no void.

Further, as things stand, things that are thrown move when what propelled them is not in contact with them—whether because of reciprocal replacement, as some people say,[177] or because the air that has been propelled propels them with a movement that is faster than the spatial movement by which what is propelled spatially moves to its proper place. But in a void none of these things holds, nor can anything be moved except in the way that what is carried is moved.

Further, none of these thinkers would be able to say why something that has been caused to move will stop somewhere; for why should it do so here rather than there? So a thing must either be at rest or must spatially move on without limit, unless something stronger impedes it.

175. Reading σώματι.

176. The idea seems to be this. A separated place P_s is like a body B. So suppose B occupies P as some whole W is supposed to occupy a part P_x of P_s. Unless a part of B is put into it separately, it will not be in a part of P, but in P as a whole (that is, in B, which occupies P). Therefore, by the same argument, W will not be in P_x.

177. E.g., Plato, *Timaeus* 59a.

Further, as things stand something is thought to spatially move in a void because the void yields to it, but in a void such yielding is everywhere alike, so that it will move in every way.

Further, the truth of what is being said is evident from the following considerations. For we see that the same weight or body spatially moves faster due to two causes, either because of a difference in the medium through which it spatially moves (for example, through water or earth, or through water or air) or because what spatially moves, other things being equal, is different due to the excess of heaviness or lightness.

The medium through which it spatially moves is a cause, in that it impedes the thing, most of all if its spatial movement is in the opposite direction, and next most if it remains unchanged. And more so a medium that is not easily divided, and a denser medium is of this sort. A, then, will spatially move through B in time C, and through D, which is more fine-grained, in time E, these being proportional to [the density of] the impeding body, provided the length of B is equal to that of D. For example, let B be water and D air, then to the degree that air is more fine-grained and less corporeal than water, to that degree A will spatially move through D faster than through B. Let speed stand in the same ratio to speed, then, as air differs in density from water, so that if air is twice as fine-grained, B will spatially move through in twice as much time as it takes to move through D, and the time C will be twice the time E. It will always be, then, that to the degree to which the medium spatially moved through is more incorporeal, less impeding, and more easily divisible, the speed will be faster.

But there is no ratio in which a void is exceeded by a body, just as there is none of nothing to a number. For if four exceeds three by one, and two by more than one, and one by even more than that by which it exceeds two, still there is no ratio by which it exceeds nothing; for what exceeds must be divisible into the excess plus what is exceeded, so that four will be what it exceeds nothing by plus nothing. That is also why a line does not exceed a point, if a line is not composed of points. Similarly, a void cannot bear any ratio to a plenum, so that neither can movement [in one bear any ratio to movement in the other]. Instead, if a thing spatially moves such-and-such a distance in such-and-such a time through the finest-grained medium, then through a void it exceeds every ratio. For example, let F be a void, equal to B and D. Then if A traverses and will move through it in a certain time G, less than time E, this [ratio of G to E] is the ratio that a void will bear to the plenum. In a time equal to G, however, A will traverse a part H of D. And it will surely also traverse in that time any body F that exceeds air in fine-grainedness in the same ratio as time E bears to time G. For if a body F is as much more fine-grained than D as E exceeds G, A, if it spatially moves through F, will traverse it in the same amount of time as G with a speed that is inversely proportional. If, therefore, there is no body in F, A will traverse it even faster. But the assumption was[178] that it would do so in G. So it will

178. 215ᵇ24.

traverse F in an equal time whether F is a plenum or a void. But this is impossible. It is evident, therefore, that if there is a time in which A will spatially move through any part whatever of a void, then this impossible result will follow; for it will be found to traverse in an equal time a plenum and a void; for there will be some body that bears to the other the same ratio as time does to time.

To speak in summary form, the cause of this result is clear, that between one movement and another movement there is always a ratio (for movement is in time, and between time and time there is always a ratio, provided both are limited), while between a void and a plenum there is none.

These, then, are the consequences that result from a difference in the media through which a body spatially moves. With regard to the excess of the bodies that are in spatial movement, on the other hand, they are as follows.

We see that the things that have a greater balance-weight of heaviness or lightness, other things being equal, spatially move across equal distances faster, and in accord with the ratio that their magnitudes bear to each other. So they will do so through a void as well. But this is impossible; for due to what cause will one spatially move across it faster? In plenums, indeed, this happens of necessity; for the greater one divides it faster by means of its strength; for the thing that is in spatial movement or is projected divides it either by means of its shape or by the balance-weight that it has. So [in a void] all will spatially move with equal speed. But this is impossible.

It is evident, then, from what has been said, that if there is a void what results is the contrary of what those who say that there is a void furnished one for.

Some people think that if indeed there is to be movement with respect to place, a void must exist that is intrinsically set apart. But this is the same as saying that a place is something separated; and that this is impossible was stated previously.[179]

But even if we investigate it intrinsically, the so-called void will manifestly be truly null and void. For just as, if one puts a cube in water, as much water as the cube will be displaced, so it is in the case of air too, although to perception this is unclear. And in the case of every body that can be displaced, then, it is always in the direction natural for it that it is necessarily displaced (provided it is not compressed), that is, always displaced downward (if its spatial movement, like that of earth, is downward) or upward (if fire), or in both directions—depending on whatever sort of body is inserted. But in the void this is impossible (for it is no sort of body), and [it must be that] throughout the cube an equal extent of void has penetrated, precisely the one, in fact, that was previously in the void, just as if the water or air had not been displaced by the wooden cube, but had penetrated it at every point.

Moreover, the cube, at any rate, also has a magnitude equal to that of a void it occupies. And even if this magnitude is also hot or cold, heavy or light, the being for it is nonetheless distinct from all its affections, even if not separable [from them]—I mean the volume of the wooden cube. So even if its volume were separated from all

179. 211b19–29.

the rest and was neither heavy nor light, it will occupy an equal amount of void and will be in the same part of the place and of the void as is equal to itself. How, then, will the body of the cube differ from the void or place that is equal to it? And if there are two such things, why can't there be any number whatever in the same place? This, then, is one absurd and impossible consequence.

Further, it is evident that the cube will have this same volume even if it is displaced, and all other bodies also have this feature. So, if it is no different from place, what need is there to posit a place for bodies beyond the volume of each, if the volume is without affections? For it contributes nothing, if there is another equal extended space of this sort around it.

Further, it should be clear what sort of thing a void is in things in movement. But as things stand it exists nowhere in the cosmos; for air is something, although it does not seem so—nor would water seem so to fish, if fish were made of iron; for what is tangible is judged by touch.[180]

It is clear from these considerations, therefore, that there is no separated void.

4.9
No Void in Bodies

There are some people who, because of the rare and the dense, think that it is evident that a void exists. For if rare and dense do not exist, it is impossible to contract and be compressed. But if this is not possible, either there will be no movement at all, or the whole universe will bulge, as Xuthus said, or change, for example, of air and water, must always be into equal amounts (I mean, for example, that if air comes to be from a cup of water, then at the same time from an equal amount of air that much water must have come to be), or a void must exist; for compression and expansion are not possible otherwise.

If they say that the rare is what contains many separated voids, then it is evident that, if it is no more possible for there to be a separable void than it is for there to be a place that has its own extension, neither can what is rare exist in this way. But if they say that, though it is not separable, there is nonetheless some void present within it, this is less impossible. But it follows, first, that the void is the cause not of all movement, but rather of movement upward (for what is rare is light, which is why they also say that fire is rare); and, second, that the void will be a cause of movement not in the way the medium is, but rather, just as wineskins, by being in spatial movement **217^a1** upward themselves, carry along what is continuous with them, so the void carries things upward. And yet how can there be a spatial movement of a void, or a place of a void? For what a void spatially moves into then comes to be a void of a void.

180. Rejecting the seclusion of this paragraph.

Further, in the case of what is heavy, how will they give an account of its moving downward? Also, it is clear that if the rarer and more void a thing is, the more it will be carried upward, then if it were wholly void, it would be carried fastest. But perhaps it is impossible for it even to move. And the same argument[181] that proves that all things are immovable in a void also proves that a void is immovable; for the speeds are incomparable.

Since we say that a void does not exist, and that, though the rest of the puzzle has been truly stated, either there will be no movement, if there is no condensation and rarefaction, or the heaven will bulge, or it will always be that an equal amount of water comes from air and air from water. For it is clear that a greater volume of air comes to be from water. It is necessary, then, if there is no compression, either that the next thing will be pushed outward, and so on, making the extremity bulge, or that somewhere else an equal amount of water must change from air, in order that the entire volume of the whole may be the same, or that nothing moves. For whenever there is displacement this will always happen, unless it comes around in a circle; but spatial movement is not always in a circle, but also in a straight line.

Because of these considerations, then, they would say that a certain void exists. We say, by contrast, on the basis of our assumptions, that there is one matter for the contraries (that is, of hot and cold, and the other natural contrarieties), and that what is actively comes to be from what is potentially, and that the matter is not separable, although the being for it is different, and that the matter, as it may be, of color and of hot and cold, is one in number.

Further, the matter of a body, both large and small, is the same—and clearly so; for when air comes to be from water, the same matter, not by acquiring something in addition, becomes another thing—although what it was potentially it became actively—and, again, water comes to be from air in the same way, the change being sometimes to greatness from smallness, sometimes to smallness from greatness. In the same way, therefore, if much air comes to occupy a smaller volume, or when from a smaller one it comes to be a greater, it is the matter, which is potentially both, that comes to be one or the other. For just as the same matter comes to be hot from cold and cold from hot, because it was so potentially, in the same way from being hot it comes to be more hot, though nothing in the matter comes to be hot that was not hot when the thing was less hot. Just as indeed if the arc or convexity of a larger circle comes to be that of a smaller circle (whether or not it is the same arc), what is convex has not come to be in anything that was not convex but straight (for it is not by there being intervals that there is less or more). Nor can we take any magnitude of flame in which hotness and whiteness[182] are not present. In the same way, therefore, the former heat is related to the later one. Thus both the greatness and smallness of the perceptible volume are extended not because of the matter acquiring something

181. 215a29–216a11.
182. I.e., brightness.

in addition, but because it is potentially the matter of both, so that the same thing is dense and rare, and the matter of them is one.

{Further, just as the arc of a circle when contracted into a smaller space does not acquire some other part that is convex, but rather what was there has been contracted; and just as any part of fire that one takes will be hot; so too all cases that are by contraction and expansion[183] are of the same matter.}[184]

The dense is heavy and the rare is light. For there are two sorts in each case, that is, of the dense as well as of the rare; for both the heavy and the hard seem to be dense, and their contraries, the light and the soft, to be rare. The heavy and the hard clash, however, in the case of lead and iron.

From what has been said, then, it is evident that a void does not exist either set apart—whether unconditionally or in the rare[185]—or potentially, unless one wishes, no matter what, to call the cause of spatial movement a "void." In that sense, the matter of the heavy and the light, insofar as they are such, would be the void; for the dense and the rare are, with respect to this contrariety, productive of spatial movement, and with respect to the hard and the soft, productive of being affected and not being affected—not a cause of spatial movement but rather of alteration.

Concerning the void, then, both the way it exists and the way it does not, let things be determined in this way.

4.10
Puzzles and Views about Time

After what has been said, the next thing to go through is time. First, it is well to go through the puzzles about it, and through the external accounts, to see whether it is among the beings or the non-beings, and then what its nature is.

That time either does not exist at all or does so scarcely or in a vague way might be suspected on the basis of the following considerations:

One part of time has been and is not, while another part of it will be and is not yet. And from these both unlimited time and whatever time is taken on any given occasion are composed. What is composed of non-beings, however, might seem to be **218^{a}1** incapable of participating in being.

In addition, in the case of everything that is divisible into parts, if it is, it is necessary that, when it is, either all or some of its parts must be. In the case of time, by contrast, although it is divisible into parts, some parts have been, some parts are to

183. Reading συναγωγῇ καὶ διαστολῇ.
184. Accepting the seclusion of this near doublet of 217^{b}2–7.
185. I.e., as gaps inside a body.

be, but none is. But the now[186] is not a part [of time]; for a part is measured,[187] and the whole is composed of [its] parts. But time does not seem to be composed of nows.

Further, it is not easy to see whether the now, which appears to divide the past from the future, remains one and the same on all occasions, or is a distinct thing again and again. For if it is always a distinct one again and again, and if the parts of time that are distinct again and again are not simultaneous (unless one encompasses and the other is encompassed, as the shorter time is encompassed by the longer), and if the now that is not but was previously must have passed away at some moment, then the nows will not be simultaneous with each other either, and it must always be that the previous now has passed away. But it cannot have passed away in itself, because it existed then, while it is impossible for a previous now to have passed away in another now. For we take it that it is impossible for nows to be contiguous to each other, as it is for a point to be contiguous to a point. If indeed, then, it has not passed away in the next now, but in another one, it will be simultaneously in the nows in between them, which are unlimitedly many. But this is impossible.

But then it is not possible either for the now to remain the same on all occasions; for nothing that is divisible and limited has [only] one limit, whether it is continuous in one direction or in more than one; but the now is a limit, and it is possible to take a limited time. Further, if to be together with respect to time, and neither before nor after, is to be at one and the same now, and if earlier and later nows are at this very now, then events of ten thousand years ago will be simultaneous with events of today and nothing will be either before or after anything else.

So much, then, by way of going through the puzzles concerning the things that belong to time.

As to what time is, and what its nature is, this is left equally unclear both by what has been handed down to us and by our own previous discussions. For some say that it is the movement of the whole universe,[188] others that it is the sphere itself.

218b1 And yet a part of the revolution of the universe is also a time, but the revolution certainly is not; for what was taken was a part of a revolution, not a revolution. Further, if there were more than one heaven, the movement of any whatever would equally be time, so that many distinct times would be together.[189]

The sphere of the whole universe was believed to be time by those who said it was, because everything is both in time and in the sphere of the whole universe. But this view is too simpleminded for us to investigate its impossible consequences.

186. 233b33–35.

187. Reading μετρεῖται.

188. E.g., Plato, *Timaeus* 38c, 39d.

189. Suppose U_1, U_2, and U_3 are different universes, each revolving at different speeds. P is some temporal process. Measured by U_1, the answer is t_1, by U_2, t_2, and by U_3, t_3. By hypothesis $t_1 \neq t_2 \neq t_3$. Yet since each measures P correctly, $t_1 = t_2 = t_3$. So that different times are together (or simultaneous).

But since time seems most of all to be a sort of movement and change, this we must investigate. The change and movement of a given thing is only in the thing that is changing, or wherever the thing itself that is moving and changing happens to be. Time, by contrast, is present equally everywhere and where everything is. Further, change is faster or slower, while time is not; for the fast and slow are defined by time—fast being what moves much in little time, slow what moves little in much time. Time, however, is not defined by time, neither by its being so much nor by its being of a certain sort. It is evident, therefore, that time is not a movement—and it makes no difference to us at present whether we speak of movement or of change.[190]

4.11
What Time Is; the Now

But then neither does time exist without change; for when we ourselves do not change in our thought or do not notice that we change, then it does not seem to us that time has passed, just as it does not seem to have done so to the fabled sleepers among the heroes in Sardinia when they wake up;[191] for they join together the earlier now to the later now and make them one, omitting what is in between because of their lack of perception. So just as, if the nows were not distinct but one and the same, there would not have been time, in the same way when they are distinct, but are not noticed to be distinct, what is in between does not seem to be a time. If, then, our not thinking that there is time happens to us when we do not distinguish any change whatever, but rather the soul seems to remain in one indivisible now, and that when we perceive and distinguish, we say that some time has passed, it is evident that time does not exist without movement and change. It is evident, then, that time neither is movement nor does it exist without movement. And since we are **219^{a}1** inquiring about what time is, we must start from this, and ask what thing belonging to movement time is.

For we do perceive movement and time together; for even when it is dark and nothing affects us through the body, but there is some movement in the soul, it immediately seems to us that some time has also passed. Moreover, when some time seems to have passed, some movement also seems to have occurred together with it. So time is either movement or something belonging to movement. Since, then, it is not movement, it must be something belonging to movement.

Since what is moving moves from something to something, however, and since every magnitude is continuous, the movement follows along with the magnitude; for because the magnitude is continuous, the movement is also continuous, and

190. $225^{a}34$–$^{b}9$.

191. According to one account, sick people received a treatment in Sardinia that involved sleeping among the dead heroes there for five days, after which they awoke remembering nothing.

because the movement is continuous, the time is too; for whatever the length of the movement is, that always seems to be the length of the time that has passed as well. The before and the after are primarily in place, then, and there they are in accord with their position. And since the before and the after are in the magnitude, it is necessary that the before and the after are also in the movement, by analogy with the ones there. But then in time too the before and the after are present, because of the one always following along with the other of them. The before and the after in movement are that thing, whatever it is, by being which movement exists,[192] but the being for it is distinct and not a movement.

But then again we come to know time once we distinguish movement, defining it by the before and the after. And we say that time has passed when we get a perception of the before and the after in movement. And we define it by grasping one [now][193] and then another, and something else in between them; for whenever we understand the extremes to be distinct from what is intermediate, and the soul says that the nows are two, one before and the other after, it is then, and it is this, that we say time is; for what is defined by the now is believed to be time—and we may assume this.

Whenever, then, we perceive the now as one, and not either as before and after in the movement or as the same but belonging to something that is before and after, no time seems to have passed, because there seems to have been no movement either. But whenever we do perceive the before and the after, then we say that there **219b1** is time; for time is this: a number belonging to movement with respect to the before and the after.

Therefore, time is not movement, but rather that thanks to which movement has a number. There is sign of this; for we judge more and less by number, but more or less movement by time. Therefore, time is a sort of number. Since, though, number is twofold (for both what is counted or what is countable and what we count them with are called "number"), time is, then, what is counted and not what we count by. And what we count by is distinct from what is counted.

Also, just as movement is always distinct again and again, so too is time (but all simultaneous time is the same; for the now, whichever now it is, is the same—though the being for it is distinct—and the now measures time, insofar as it determines a before and an after[194]).

But the now is in a way the same and in a way not the same; for insofar as the now is in something that is different again and again, it is distinct (this is what it

192. Reading ἐστιν. The phrase refers not to the being for, or essence of, movement but to the ground of that essence.

193. Reading αὐτό.

194. Reading τὸ δὲ νῦν τὸν χρόνον μετρεῖ, ᾗ πρότερον καὶ ὕστερον ὁρίζει. Suppose that M_1, M_2, and M_3 are distinct movements, whose starting-points are simultaneous, and suppose that times N_1, N_2, and N_3 are the nows that give them definition, or mark them off, at that point. Then, since simultaneous nows are identical (219b10), $N_1 = N_2 = N_3$, but they differ in being because N_1 marks the start of M_1, not that of M_2 or M_3, and so on.

is for it to be a now), while the now, as that (whatever it is) by being which it is [what it is], is the same. For, as we said,[195] movement follows along with magnitude, and time follows along with movement, as we are saying here; and as in the case of the point, so likewise in the case of the thing in spatial movement by which we come to know movement and the before and the after in it. And what is in spatial movement, in respect of that thing (whatever it is) by being which it is [what it is], is the same (whether a point, a stone, or something else of this sort), but in account it is distinct—just as the sophists take Coriscus-in-the-Lyceum and Coriscus-in-the-marketplace to be distinct.[196] What is in spatial movement, then, is distinct by being in distinct places, and the now follows along with what is in spatial movement, just as the time does with the movement (for it is by what is in spatial movement that we know the before and the after in movement, and the before and the after insofar as they are countable is the now). So in this case too that thing (whatever it is), by being which the now is [what it is], is the same (for it is the before and the after in movement), although the being for it is different (for that by means of which the before and the after are countable is the now).

And it is this that is most of all known; for the movement too is known by what is moving and spatial movement by what is in spatial movement; for what is in spatial movement is a this something, while the movement is not. In one way, then, the now is always the same, and in another way not the same; for what is in spatial movement is so too.

It is evident too that if time did not exist, the now would not, and if the now did not, time would not; for just as what is in spatial movement and its spatial movement are together, so too are the number of what is in spatial movement and the number of its spatial movement.[197] For the number of the spatial movement is time, while the now corresponds to what is in spatial movement, as a sort of unit of number.

Also, time is both continuous in virtue of the now and divided at the now; for this too follows along with the spatial movement and what is in spatial movement. For in fact the movement (that is, the spatial movement) is one in virtue of what is in spatial movement, because it is one—and not because that thing (whatever it is), by being which it is [what it is], is one (since that might leave intervals), but rather because it is one in account.[198] And this is what gives definition to the movement as movement before and movement after.

195. 219^a11–12.

196. *Met.* 1026^b15–18.

197. M_1 and M_2 are spatial movements. If they are two distinct but contiguous stages in the same movement, they must be contiguous states in the movement of the same spatially moving object O_1. Similarly, if the time t_1 that M_1 takes is to be contiguous to the time t_2 that M_2 takes, then the now N_1 that marks the end of t_1 must be coincident with the now that marks the beginning of t_2, or vice versa. Thus N_1 unifies t_1 and t_2 in the way that O_1 unifies M_1 and M_2.

198. The thing (whatever it is), by being which a spatially moving object O_1 is what it is, is O_2, the object that is in fact in spatial movement M_1 but could be at rest. It is not O_2 that makes M_1 one movement, since O_2 might alternately move and rest. Instead it is O_1 that makes M_1

In this respect too the now follows along in a way with the point; for the point also both makes the length continuous and gives it definition; for it is the start of one length and the end of another. But when one takes it in this way, treating the one point as two, one must come to a stop, if the same point is going to be start and end. The now, on the other hand, because what is in spatial movement is in movement, is always a distinct one.

So time is a number, not as being the number of the same point, because the latter is both start and end, but more of the points as the extremes of the line, and not as the number of the parts—both because of what was said (for we can treat the middle point as two, so that being at rest will result), and further, because it is evident that the now is no part of time, nor the division a part of the movement, any more than the point is a part of the line (on the contrary, it is the two segments that are parts of the one line). Insofar as the now is a limit, then, it is not time, but rather a coincident of it, while insofar as it counts, it is a number; for limits belong only to what they are the limits of, while the number of these horses—ten—is elsewhere too.

It is evident, therefore, that time is a number belonging to movement with respect to the before and the after, and that it is continuous; for what it belongs to is continuous.

4.12
Various Affections of Time; What It Is to Be in Time

The smallest number unconditionally is the two.[199] But of a sort of number there is in one way a smallest, in another way not—for example, of a line, the smallest number in plurality is two lines (or one line), but in magnitude there is no smallest; for every line can always be divided. So it is with time too; for the smallest [time] in number is the one or the two, but in magnitude there is none.

220b1 It is evident too that time is not said to be fast or slow, but much or little, and long or short. For insofar as it is continuous it is long or short, while insofar as it is a number it is much or little. But it is not fast or slow; for no number with which we count is fast or slow either.

Also, it is the same time everywhere at once, but not the same time before and after, because the present change[200] is also one, while the past change and the future change are distinct. And time is not the number by which we count but the number

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one movement. It does this, however, not by being one in number but by being one in account. For O_1 is a distinct thing on each occasion, just like the now (219b31–33). But of all these distinct things the account is "O_1 spatially moving from place P_1 to place P_2," where P_1 and P_2 are coincident with the nows N_1 and N_2 that give definition to M_1 by being its starting- and end-points.

199. *Met.* 1056b25–27, 1088a4–8.

200. I.e., a particular change whose starting-point is coincident with the present now.

that is counted, and this, occurring before and after, is always distinct; for the nows are distinct. The number of a hundred horses and of a hundred human beings is one and the same, but the things—the horses and the men—it is a number of are distinct. Further, in the way that a movement can be one and the same again and again, so too can a time—for example, a year, a spring, or a fall.

Not only do we measure the movement by the time, but also the time by the movement, because they are given definition by each other; for the time gives definition to the movement (for it is its number), and the movement to the time. And we speak of much time and little time, measuring it by the movement, just as we measure the number by what is countable—for example, by the one horse we measure the number of horses. For it is by the number that we know the quantity of horses, and, conversely, by the one horse that we know the number of horses itself. It is the same way in the case of time and movement; for we measure the movement by the time and the time by the movement. And it is reasonable that this has happened, because the movement follows along with the magnitude and the time with the movement, for they are a quantity, divisible, and continuous; for it is because the magnitude is like this that the change has these affections and because movement is like this that time does. And we measure both magnitude by movement and movement by magnitude; for we say that road is long, if the journey is long, and that the latter is long, if the road is long, and that the time is, if the movement is, and the movement, if the time.

Since time is a measure of movement, however, and of being moved, and since it measures a movement by defining some movement that will measure out the whole (just as the cubit measures length by defining some magnitude that will measure out the whole), and for a movement to be in time is for both it and the existence of it to be measured by time (for time at once measures the movement and the existence of the movement), this is what it is for it to be in time, for its existence to be measured; it is clear, though,[201] that for other things too this is what it is to be in time: it is for their existence to be measured by time.

For to be in time is one or other of two things: to be when time is, or in the way that we say of some things that they are in number. The latter signifies either what is a part or affection of number, or, in general, something that belongs to number, or that there is a number of it. And since time is a number, the now, the before, and everything of this sort are in time in the way in which the unit and the odd and the even are in number (for the latter are something belonging to number, as the former are something belonging to time). Things, by contrast, are in time as they are in number. And if this is so, they are encompassed by time, just as things in number are encompassed by number, and things in place by place.

It is evident too that to be in time is not to be when time is, any more than to be in movement or in place is to be when movement is or when place is. For if this is

201. Reading δῆλον δὲ.

what being in something is to be, then all things will be in anything whatever, and the heaven will be in a grain of millet; for when the grain is, the heaven is too. But this is coincidental, while the other follows of necessity, and for what is in time there must be a certain time when that thing is too, and for what is in movement, there must be movement at that time.

But since what is in time is so as in number, a time may be taken that is greater than that of all that is in time, which is why it is necessary for all things in time to be encompassed by time, just like the other things that are in something—for example, the ones in place that are encompassed by place. And a thing is affected in some respect by time, just as we are accustomed to say that time dissolves things, that everything grows old due to time, and forgets because of time, but not that it learns because of time, becomes young, or becomes beautiful; for time is intrinsically a cause rather of passing away [than of coming to be]; for it is the number of movement, and movement removes what is present.

So it is evident that the things that always are, insofar as they always are, are not in time; for neither are they encompassed by time nor is their being measured by time. A sign of this is that they are not affected by time either, suggesting that they are not in time.

Since time is the measure of movement, however, it will be the measure of rest too; for all rest is in time. For it is not the case that, as everything in movement must move, so it must be too with what is in time; for time is not movement, but the number of movement, and it is also possible for what is at rest to be in the number of movement. For not everything that is unmoving is at rest, but only what, though lacking movement, is naturally able to move itself, as was stated in the previous discussion.[202]

For a thing to be in number is for there to be some number of the thing, and for the being of it to be measured by the number in which it is, so that if it is in time, by time. And time will measure what is moving and what is at rest, insofar as the one is moving and the other is at rest; for it will measure the movement and the rest, saying of what quantity each is. So what is moving, insofar as it is some quantity, will not be measurable by time simply, but insofar as its movement is of some quantity. So none of the things that are neither in movement nor at rest are in time; for to be in time is to be measured by time, and time is a measure of movement and rest.

It is evident, then, that not every non-being will be in time—for example, all the ones that do not admit of being otherwise, such as the diagonal's being commensurable with the side. For, in general, if time is intrinsically a measure of movement and of other things coincidentally, it is clear that for the ones whose being it measures, for all of them, their being lies in being at rest or moving. Those things, then, that admit of passing away and coming to be and, in general, that at some time are and at some time are not, must be in time (for there will be some greater time that will exceed

202. 202a4–5.

both their being and what measures the existence of them). By contrast, non-beings that were (for example, Homer once was) or ones that will be (for example, something in the future) are encompassed by time on whichever of the two sides of the present it encompasses them, and if on both sides, both. But those that time in no way encompasses neither were nor will be. And these are the sorts of non-beings whose opposites always are, as the diagonal's being incommensurable always is, and this will not be in time. Nor, therefore, will its being commensurable be in time. That is why it always is not: because it is the contrary of what always is. As for those things where it is not the case that the contrary always is, these are capable of being and of not being, and there is a coming to be and passing away of them.

4.13
What Now, at Some Time, Just, Recently, Long Ago, and Suddenly Are

The now is a continuity-maker for time, as was said;[203] for it makes past and future time continuous. And it is, in general, a limit[204] of time; for it is a starting-point of one time and an end-point of another, although this is not evident, as it is in the case of the point remaining where it is. It divides potentially, and insofar as it does so the now is always a distinct one, while insofar as it binds together it is always the same,[205] just as in the case of mathematical lines (for to the understanding it is not always the same point; for it divides in distinct places on distinct occasions; but insofar as it is one, it is the same on all). So too the now is, on the one hand, a potential divider of time, and, on the other hand, the limit and unifier of both segments. But the division and the unification are the same and with respect to the same thing, but their being is not the same.

This, then, is one way in which things are said to be now. Another is when the time of something is near at hand: he will come now, because he will come today; he has now come, because he came today. But the events in the *Iliad* have not happened now, nor is the flood now; and yet the time leading to them is continuous, but they are not near at hand.

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203. 220^a5.

204. Reading ὅλως πέρας.

205. Unlike a point p on a spatial line L, at which L can be actually divided into two disjoint line segments L_1 and L_2, a now N_1, which is coincident with time t_1 in a temporal series S, cannot actually divide S into two disjoint temporal series, since time cannot stop and start in the requisite way. Instead N_1 divides S potentially at t_1, into S_1 (times earlier than t_1) and S_2 (times later than t_1). But to do so it must be distinct from all the times in S_1 and all the times in S_2, and so from all the nows coincident with those times. The now that binds together S_1 and S_2, by contrast, must be coincident with a time t_x in S_1 and with a time t_y in S_2, and so must always be the same now, since coincident (or simultaneous) nows are identical. Think of t_x as the last point in S_1 and t_y as the first point in S_2; these must be coincident if S is to be a continuous time.

And the "at some time" is defined relative to the first sort of now[206] (for example, at some time Troy was taken, and at some time there will be a flood); for the time must be limited relative to the now. There will, therefore, be a certain quantity of time from this to that [future one], and there was a certain quantity to the past one. But if there is no time that is not "at some time," every time will be limited.

Will time, therefore, give out? Or will it not do so, if indeed there is always movement? Will a time, then, [always] be a distinct one, or the same one many times over? It is clear that time exists in the same way that movement exists; for if one and the same movement comes to be at some time, the time too will be one and the same, and if not, it will not be. But since the now is an end-point and a starting-point of time, though not of the same time, but rather is an end-point of past time and a starting-point of future time, then, just as the circle has its convexity and concavity in the same thing in a way, so too time is always at a starting-point and at an end-point. And because of this it seems to be always distinct; for the now is not the starting-point and end-point of the same thing; for otherwise contraries would hold of it at the same time and in the same respect. Time will not give out, then; for it is always at a starting-point.[207]

The "just" is the part of future time that is close to the present indivisible now: When are you taking a walk? I'm just taking it (because the time in which the person is going to take it is near at hand). Or, it is the part of past time that is not far from the now: when are you taking a walk? I've just taken it. But to say that Troy has just been taken—we do not say that, because it is too far from the now. The "recently" is part of the past that is close to the present now: When did you come? Recently (if the time is near to the presently existing now). What is far away from now is "long ago." The "suddenly" is what departed from its former condition in a time that is imperceptible because of its smallness. {And all change is a departure from a former condition.}[208]

It is in time that all things come to be and pass away. That is why some people called it the "wisest" of all things, while Paron the Pythagorean, speaking more correctly, called it the "most ignorant," because people forget in time. It is clear, then, that it will be intrinsically the cause of passing away rather than of coming to be, as was stated earlier[209] (for change is intrinsically a departure from a former condition), but it is coincidentally a cause of coming to be and of being. An adequate sign of this is that nothing comes to be without its being moved in some way and being affected,[210] while a thing may pass away even though it does not move at all. And this above all is what is usually said to be passing away due to time. Nevertheless, time does not produce even this change, although it happens that it too occurs in time.

206. 222[a]20–21.
207. 251[b]19–23.
208. Secluded as a near doublet of ἐκστατικὸν γὰρ ἡ μεταβολὴ καθ' αὑτήν at 222[b]21.
209. 221[b]1–3.
210. Reading πάσχειν.

That time exists, then, and what it is, and in how many ways something is said to be now, and what at some time, recently, just, long ago, and suddenly are, has been stated.

4.14
Before in Time; Time and the Soul

With these issues determined by us in this way, it is evident that every change and everything in movement is in time. For the faster and slower exists with respect to every change (for it is seen in every case). By something's "moving faster" [than another] I mean that it changes before the other into the given condition, when it covers the same distance with a regular movement—for example, in the case of spatial movement, if both things move along the circumference of a circle, or both along a straight line, and similarly in all other cases. But then what is before is in time; for we say before and after with respect to the distance from the now, and the now is the defining mark between the past and the future. So since the nows are in time, the before and the after will also be in time; for what the now is in, the distance from the now will be in too. (Things, though, are said to be before in contrary ways with respect to past time and future time. For in the past we say that what is before is further from the now, what is after nearer to it, while in the future we say that what is before is nearer, and what is after further.) So since the before is in time, and the before goes along with every movement, it is evident that every change and every movement is in time.

It is also worth investigating how time is any way related to the soul, and why time seems to be in everything—on earth, in the sea, and in the heaven. Or is it because time is an affection or state of movement, since it is in fact the number of it, and because all these things are movable (for they are all in place), and time and movement are together, both potentially and actively?

One might raise a puzzle, however, as to whether if soul did not exist, time would exist or not. For if it is impossible for there to be something to do the counting, it is also impossible for anything to be countable, so that it is clear that number would not exist either. For a number is either what has been counted or what can be counted. But if there is nothing that has it in its nature to do the counting other than soul, and—of soul—understanding, then it is impossible for time to exist if the soul does not exist, except that there might be that thing (whatever it is) by being which time is [what it is]—for example, if it is possible for movement to exist without soul. But the before and the after are in a movement; and time is these insofar as they are countable.

One might also raise a puzzle, however, as to what sort of movement time is the number of. Or is it of any sort whatever? For things come to be and pass away, and increase, alter, and spatially move in time. Insofar as each is a movement, then, to this

extent time is its number. That is why it is unconditionally the number of continuous movement, and not of a particular sort of it. But [it might be objected] it is possible
223ᵇ1 that now another thing has also moved, with time being the number of each of the two movements. Is there, then, a distinct time, and will there be two equal times at once? Or is this not so? For a time that is both equal and together is one and the same time, and even those that are not together are the same in form; for suppose there are
5 dogs and horses, seven of each, the number is the same. In the same way, movements that have limits that are together take the same time, although one perhaps is fast and the other not, one a spatial movement and the other an alteration. Yet the time of the alteration and of the spatial movement is the same, if indeed it is the case both that its number[211] is equal and [their limits] together. And this is why, while movements
10 are distinct and separate, time is the same everywhere, because the number belonging to things that are equal and together is also one and the same everywhere.

But since there are spatial movements and, among them, the circular movement, and each thing is counted by some one thing of the same kind, units by a unit, horses by a horse, and in the same way time by some definite time, and since, as we said,[212]
15 time is measured by movement as well as movement by time (and this is so because the quantity of the movement and the quantity of the time is measured by a movement defined by the time)—if, then, what is first is the measure of all things of the same kind, regular circular spatial movement is most of all a measure, because the number of
20 it is most known. (Neither alteration, nor increase, nor coming to be are regular, while spatial movement is.) That is why time is thought to be the movement of the sphere;[213] because the other movements are measured by this one, and time by this movement.

This is also why the customary saying comes about; for it is said that human affairs
25 go in a circle, as do the other things that have a natural movement and coming to be and passing away. And this is so because all other things are judged by time, and get an end-point and a starting-point as if in accord with a certain temporal cycle. For even time itself is thought to be a sort of circle, and this, in turn, is thought because
30 it is the measure of this sort of spatial movement, and is itself measured by this sort. So to say that those things that come to be go in a circle is to say that there is a certain circle of time, and this is so because it is measured by the circular spatial movement; for the measured thing[214] appears to be nothing beyond the measure, while the whole
224ᵃ1 universe involves a plurality of measures.[215]

211. Reading ὁ ἀριθμὸς.
212. 220ᵇ23–24.
213. I.e., the sphere of the whole universe (218ᵇ5–7).
214. Reading τὸ μετρούμενον.
215. Aristotle is explaining how people came falsely to think that time itself is a sort of circle. When they looked at the measured thing they saw nothing beyond the measure, namely, the circular spatial movement of the sphere (223ᵇ30–31). But had they looked at the other regular movements within the sphere, which are equally good measures of time, they would have seen that time cannot be identical to any one of them.

It is also correctly said, however, that the number of the sheep and that of the dogs is the same number, if the two numbers are equal, but they are neither the same ten nor ten of the same things, just as the equilateral and the scalene are not the same triangles, and yet they are the same figure, because both are triangles; for things are said to be the same if they do not differ by a differentia, but not if they do—for example, triangle differs from triangle by a differentia of triangle (therefore, they are then distinct triangles), but they do not differ by one of figure, but are in one and the same division of it. For such-and-such sort of figure is a circle, and such-and-such sort a triangle, and, of this, such-and-such sort is equilateral, and such-and-such sort scalene. They are, then, the same figure, and this a triangle, but not the same triangle. The numbers [we are discussing], then, are also the same number (for one does not differ from the other by a differentia of number), but is not the same ten; for the things of which it is said differ; for the one lot are dogs and the other lot horses.

Time—both time itself and the topics that properly belong to its investigation—has now been spoken about.

BOOK 5

5.1
Classification of Movements and Changes

Among all things that change, some change coincidentally, as when we say that the musical walks, because something that is coincidentally musical walks; others are said simply to change, because something in them changes—for example, those said to change in respect of their parts (for the body becomes healthy, because the eye or the chest does, and these are parts of the whole body); and there is also something that is moved neither coincidentally nor in virtue of something else belonging to it, but is itself moved primarily. And this is the intrinsically movable, but with respect to distinct sorts of movement, it will be distinct—for example, alterable. And within the sphere of alteration, curable is distinct from heatable. It is the same way in the case of the mover; for one thing causes movement coincidentally, another in virtue of a part in it, another intrinsically and primarily—for example, the doctor cures, and the hand strikes a blow.

There is, then, a thing that causes movement primarily; a thing that is moved; further, that in which, the time; and, beyond these, that from which and that to which; for every movement is from something to something; for the thing primarily moved is distinct from that to which and that from which it is caused to move—for example, wood, hot, cold, of which the first is the thing, the second, that from which, **$224^{b}1$**

the third, that to which. But[216] it is clear that the movement is in the wood, not in the form; for the form neither causes movement nor is moved, and the place and the quantity do not do so either. On the other hand, there is the mover, the moved, and that to which it is moved. And it is the to which rather than the from which that the change is named after. That is why passing away is a change to non-being, even though what passes away also changes from being, and why coming to be is a change to being, and yet it is also a change from non-being.

We stated earlier what movement is.[217] But the forms, affections, and the place to which moving things are moved are immovable—for example, scientific knowledge and heat. And yet one might raise a puzzle as to whether affections (paleness being an affection) are movements: but then[218] there will be change to a movement. But presumably it is not paleness that is a movement, but turning pale. And in these cases too there is what is coincidental (what is in virtue of a part or what is in virtue of something else) and what is primarily and not in virtue of anything else—for example, a thing that is turning pale changes coincidentally to a thing being understood (for the color is coincident with its being understood), it changes to color, because pale is a part of color (and to being in Europe, because Athens is part of Europe), but it changes intrinsically to the color pale.

It is clear, then, in what way a thing is in movement intrinsically, coincidentally, or in virtue of something else; and—in the case both of the mover and of the moved—in what way in respect of something else and in what way by itself primarily; and it is also clear that the movement is not in the form but in the thing that is moving, that is, in what is actively movable.

Coincidental change we may set aside; for it exists in all things, at all times, and in all respects. Change that is not coincidental, by contrast, is not found in everything, but rather in contraries, their intermediates, and contradictories. We may be persuaded of this by induction. Something changes from an intermediate; for it uses the intermediate as a contrary in relation to either of the two contraries; for the intermediate is in a way the extremes.[219] That is why we speak of it in relation to them, and them in relation to it, as in a way contraries—for example, the middle note is low-pitched in relation to the highest-pitched and high-pitched in relation to the lowest-pitched, and gray is white in relation to black and black in relation to white.

And since every change is from something to something—as the name (*metabolê*) itself makes clear, indicating something after (*meta*) something else, that is, one thing earlier and another later—what changes must change in one of four ways: from an underlying subject to an underlying subject; from an underlying subject to what is not an underlying subject; from what is not an underlying subject to an underlying subject; or from what is not an underlying subject to what is not an underlying

216. Reading δὲ.
217. 201ᵃ10–11.
218. Reading δὲ.
219. *Met.* 1057ᵃ18–19.

subject (I mean by "underlying subject" what is made clear by an affirmation[220]). So it is necessary on the basis of what has been said that there are three sorts of change: that from an underlying subject to an underlying subject; that from an underlying subject to what is not an underlying subject; and that from what is not an underlying subject to an underlying subject. For there is no change from what is not an underlying subject to what is not an underlying subject, because there is no opposition; for the terms are not contraries nor is there any contradiction involved.

A change from what is not an underlying subject to an underlying subject, that is, a change in accord with contradiction, is a coming to be—an unconditional coming to be when the change is unconditional, in a certain respect when the change is in a certain respect. For example, a change from not pale to pale is a coming to be in this respect, pale, while a change from unconditionally not being to substance is unconditional coming to be, with respect to which we say that a thing comes to be unconditionally, not that it comes to be something.

A change from an underlying subject to what is not an underlying subject is a passing away—an unconditional one when the change is from substance to not being, in a certain respect when the change is to the opposite contradictory, as was said in the case of coming to be.

If things are said not to be in many ways, and there can be movement neither of what by composition or division is not[221] nor of what potentially is, which is the opposite of what actively is unconditionally (for although what is not pale or not good may nonetheless be in movement coincidentally, for what is not pale may be a human, still what is unconditionally not a this [something] cannot in any way be in movement), then it is impossible for what is not to be in movement (and if this is so [it is equally impossible] for coming to be to be a movement; for, indeed, [we may say that] what is not comes to be [something]; for to whatever extent it comes to be [something] coincidentally, it is nonetheless true to say that it belongs to what is not to unconditionally come to be)—and it is likewise impossible for what is not to be at rest.

There are these difficulties, then, with the being in movement of what is not,[222] and another arises if all things that are in movement are in a place and what is not is not in a place; for then it would be somewhere.

Passing away, then, is not a movement either; for the contrary of a movement is either a movement or rest, while passing away is the contrary of coming to be.

Since, then, every movement is a sort of change, and changes are the three sorts we mentioned, and since among these changes, coming to be and passing away are not movements, and movements are changes with respect to contradictories, it necessarily follows that only change from an underlying subject to an underlying subject **$225^{b}1$**

220. $225^{b}3$–5.

221. What is not by combination is an untrue affirmative; what is not by division is an untrue negative.

222. Retaining τῷ κινεῖσθαι τὸ μὴ ὄν.

is movement. And underlying subjects are either contraries or intermediates (for a privation may be posited as a contrary), and may be made clear by an affirmation, [like] naked, toothless, or black.

If, then, the categories are distinguished as substance, quality, place, time,[223] relative, quantity, and affecting or being affected, it necessarily follows that there are three sorts of movement—that of a quality, that of a quantity, and that with respect to place.

5.2
Classification of Intrinsic Movements; Immovability

There is no movement with respect to substance, however, because there is no contrary to substance among the beings. Nor is there with respect to[224] the relative; for when one of the two relata changes,[225] it may be true that the other does not change at all, so that the movement of them is coincidental. Nor is there movement of affecting or being affected, or of any[226] mover and any moved, because there is no movement of movement nor coming to be of coming to be, nor, in general, change of change.

For, in the first place, there are just two ways in which there might be movement of movement: As an underlying subject (for example, as a human is in movement because he changes from pale to dark), so that in this way the movement too might be heated or cooled, change its place, increase or decrease. But this is impossible; for a change is not a sort of underlying subject. Or some other underlying subject might change from one change to some other forms [of change], like a human does from sick to healthy.[227] But this is not possible either, except coincidentally; for this[228] movement is a change from one form to another. (Coming to be and passing away are also like that, except that they are to things opposed in one way, while the other—movement—is to things opposed in another way.) A thing changes at the same time from health to sickness, then, and from this change itself to another. It is clear, then, that when it has become sick, it will have changed to whatever the other sort of change may be (for it may remain at rest), and never to some random sort. And this new change will be from something to something else, so that this will in fact be the opposite change: becoming healthy. But [we will respond that] this is by coincidence, as there is change from recollecting to forgetting, because what these belong to changes, now to scientific knowledge, now to health.[229]

223. Retaining καὶ τῷ ποτὲ.
224. Reading τῷ.
225. Rejecting the addition of ἀληθεύεσθαι καὶ μὴ.
226. Reading οὐδὲ παντός.
227. Rejecting the transposition of οἷον ἀνθρώπου ἐκ νόσου εἰς ὑγίειαν to 225b24–25.
228. Reading αὕτη.
229. Reading ὑγίειαν.

Further, it will go on without limit, if there is to be change of a change and coming to be of a coming to be. If the later is so, then the earlier must also be so. For example, if the simple coming to be was at some time coming to be, what comes to be something was also at some time coming to be. So what simply comes to be something was not yet there, but there was already something that was coming to be coming to be something. And again this was at some time itself coming to be, and so it was not yet at that time coming to be coming to be. But since in an unlimited series there is no first term, there will be no first here either, and so neither will there be a following one. Nothing, then, can either come to be, move, or change.

Further, the same thing that admits of movement also admits of the contrary movement (and further, of coming to rest), and of coming to be and passing away. So what is coming to be coming to be is passing away when it has come to be coming to be. For it cannot pass away as soon as it is coming to be, nor after it has come to be, since what is passing away must be.

Further, there must be a matter that underlies both what comes to be and what changes. What, then, will it be? What is it that becomes a movement or a coming to be, as a body or a soul is what undergoes alteration? And, again, to what do they move? For it[230] must be the movement or coming to be of something from something to something. But how will it also be at the same time? For the coming to be of learning is not learning, and so no coming to be of a coming to be is a coming to be, and nor can any specific coming to be be a coming to be of a specific coming to be.

Further, if there are three forms of movement, then the underlying nature and that to which it proceeds must be one or other of these—for example, a spatial movement must be altering or in spatial movement.

In general, then, since everything is moved in one of three ways, either coincidentally, in virtue of a part of it, or intrinsically, change can change only coincidentally, as when the one being cured runs or learns. And coincidental change we set aside not long ago.[231]

Since there is no movement either of substance or of the relative or of affecting and being affected, it remains for movement to be with respect to quality, quantity, and place. For in each of these there is contrariety. Movement with respect to quality we may call "alteration," since it has been joined to this common name. By "quality" I mean not what is in the substance (for even the differentia is a quality[232]), but the affective quality in virtue of which a thing is said to be capable of being affected or to be unaffectable. Movement with respect to quantity, as regards its common feature, has no name, but with regard to each of its two varieties it is called "increase and decrease"—that to the complete magnitude being increase, that away from it being decrease. Movement with respect to place has neither a common nor a special name,

230. Reading τι.
231. $224^{b}26$–27.
232. *Met.* $1020^{a}33$–34.

but we may call the common sort "spatial movement," and yet things are said to be spatially moving in the strict sense only when, without its being up to them, they change their place, to stop [moving], as are things that do not move themselves with respect to place.

226[b]1 Change within the same form but with respect to the more and the less is alteration; for it is movement from a contrary to a contrary, whether unconditionally or to some degree; for when it proceeds to the less, it will be said to be changing to the contrary, and when to the more, from the contrary to the affection itself. For it makes no difference whether the changing is to some degree or unconditional, except that in the former case the contraries will have to be present only more or less. And the more and the less is the presence or absence of a greater or lesser degree of the contrary [of the affection].

On the basis of these considerations, then, it is clear that there are [only] these three sorts of movements.

A thing is immovable either when it is wholly incapable of being moved (in the way that a sound is invisible), or when it is moved scarcely at all in a long time or is slow in starting to be moved, that is, when it is said to be difficult to move; or when it is naturally moved and is capable of being so but is not moved either when, where, or how it should in accord with its nature be moved. Among the immovables, the last is the only one I call precisely "at rest"; for rest is contrary to movement, so that it must be a privation in what is receptive of movement.

It is evident from what has been said, then, what movement is, what rest is, and how many sorts of changes and what sorts of movements there are.

5.3
Together, Separate, Making Contact, Intermediate, Successive, Contiguous, Continuous

We next proceed to say what "together [or coincident]" and "separate" are, what "making contact [or touching]" is, what "intermediate" is, and what "successive," "contiguous," and "continuous" are, and to what sorts of things each of these naturally belongs.

Things are said to be together in place when they are in one first place,[233] to be separate when they are in distinct ones, and to be making contact [or touching] when their extremities are together in place.[234]

227[a]7 Since all change is between opposites, however, and these are either contraries or contradictories, and there is no middle term between contradictories, clearly what is intermediate is between contraries. Thus an intermediate involves at least three

233. 209[a]31–[b]1.

234. The Bekker text of what follows is reorganized as indicated.

things. For in a process of change it is the contrary that is the ultimate thing. And an **226b26**
intermediate is what a changing thing—if it changes continuously—arrives at prior 27 | 23
to arriving at the ultimate thing to which, in accord with its nature, it is changing
continuously. And something is moving continuously if it leaves no intervals, or 27
leaves the smallest interval, in the thing—not in the time (for an interval in the time
does not prevent this, and on the other hand immediately after the highest note the
lowest note may sound), but in the thing in which the movement takes place. This is 30
evident in changes with respect to place as well as in other sorts of changes. And to
be contrary in place is to be most distant along a straight line; for the shortest line is
limited, and what is limited is a measure.

A thing is successive when it is after the starting-point in position, in form, or in
some other definite way and when there is nothing of the same kind between it and 35
what it succeeds—I mean, for example, line or lines in the case of a line, units in that **227a1**
of a unit, or houses in that of a house (but there is nothing to prevent something
of some other sort from being in between). For what is successive is successive of
something and is something posterior; for one does not succeed two, nor the first day
of the month the second, but the other way around. What is contiguous is what is 5
successive and making contact.

And continuity is precisely a sort of contiguity. I mean that two things are contin- 10
uous (*suneches*) when the limits of each by which they make contact become one and
the same thing and, as the name signifies, hold together (*sunechêtai*). But continuity
is impossible if these extremities are two. From this definition it is evident that the
continuous is found in those things that by nature become one in virtue of their
making contact. And in whatever way what holds them together is one, so too will 15
the whole be one—for example, by being nailed together, by being glued together, by
contact, or by natural assimilation.

It is also evident that the successive is primary; for things that make contact are
necessarily successive, but not all things that are successive make contact. That is
why succession is found in things, such as numbers, that are prior in account, while
contact is not. And if there is continuity there is necessarily contact, while if there 20
is contact, there need not be continuity; for it is not necessary for the extremities of
things to be one if they are together, but if they are one, it is necessary for them also
to be together. So a natural unity is last in coming to be; for it is necessary for the
extremities to make contact if they are to be naturally unified. But things that are
making contact are not all naturally unified, and in things where there is no contact, 25
in these it is clear that there is no natural unity either.

So, if there is a point and a unit that exist separately, as some people say,[235] it is
impossible for unit and point to be the same; for in points there is contact, while
in units there is only succession. Also, while it is possible for there to be some-
thing intermediate between points (for all lines are intermediate between points), 30

235. Pythagoreans and Platonists. See *Met.* 13.13.

between units there need not be; for there can be nothing intermediate between two and one.

It has now been stated what together and separate are, what making contact is, what intermediate and successive are, what contiguous and continuous are, and the
227b1 sorts of things each of these belongs to.

5.4
What It Is for a Movement to Be One in Kind, in Form, or Unconditionally

A movement is said to be one in many ways; for we say that things are one in many ways. A movement is one in kind in accord with the figures of predication[236] (for any
5 spatial movement is one in kind with any other spatial movement, while alteration is distinct in kind from spatial movement). It is one in form when it is one in kind and is in an indivisible form. For example, there are differences of color (therefore turning dark and turning pale are distinct in form; but be that as it may, every turning pale will be the same in form with every other turning pale and every turning dark
10 with every other turning dark), while of paleness there are not. That is why any turning pale is one in form with any other turning pale. If, however, there is a kind that is at the same time a form, it is clear that the movement will then in a way be one in form, but will not be unconditionally one in form—for example, learning, if scientific knowledge is, on the one hand, a form of supposition, and, on the other, the kind of the sciences.

But one might raise a puzzle as to whether the movement is one in form, when
15 the same thing changes from the same to the same—for example, when one point changes again and again from a particular place to the same particular place. If it is, then circular spatial movement and rectilinear spatial movement will be the same in form, as will rolling and walking. But was it not determined that the movement is distinct in form if what it occurs in is distinct in form, and are not the circular and
20 the rectilinear distinct in form? In kind, then, and in form, a movement is one in this way.

A movement is unconditionally one, on the other hand, when it is one in substance and in number. And what sort of movement this is will be clear from the following distinctions. For there are three things that we speak of in connection with movement: the thing, what it is in, and when. I mean that there must be something that is in movement (for example, a human or gold), and it must be moving in
25 something (for example, in a place or in an affection), and at some time; for all movement occurs in time. Among these three, being one in kind or in form depends on the thing in which the movement occurs being one, being contiguous depends

236. I.e., the categories (225b5–9).

on time, while being unconditionally one depends on all three. And indeed that in which must be one and indivisible, as the form [of movement] is, and the when (the time) must be one and without intermission, and what is in movement must be one, but neither coincidentally (like the pale turning dark or Coriscus walking—Coriscus and the pale are one, but coincidentally) nor in virtue of something common; for two human beings might be being cured at the same time with the same curative process—for example, from eye disease; yes, but this movement is not [unconditionally] one, but one in form. As for Socrates undergoing an alteration that is the same in form at one time and then again at another, if it is possible for what passed away to come to be again while remaining one in number, then this alteration will also be one, if not, it will be the same [in form], but not one.

There is another puzzle much the same as this, as to whether health, and, in general, the states and affections of bodies, are one in substance; for the things that have them are manifestly in movement and flux. If, then, a person's health at daybreak and his health now are one and the same, why should it not also be one and the same as the health he recovers again after an interval? In fact, the same argument applies [to states and activities], except for this difference, that if [the states] are two, it follows because of this that the activities must also be two in number (for an activity that is one in number belongs to a state that is one in number), while if the state is one, perhaps this would seem not yet to be enough for the activity also to be one (for when someone stops walking, the walking no longer exists, but when he is walking again, it will exist again). In any case, if the health is one and the same, it must be possible for what is one and the same to pass away and exist many times over. The puzzles, however, lie outside our present investigation.

But since every movement is continuous, a movement that is unconditionally one must (if indeed every movement is divisible) be continuous, and, if continuous, then also one. For not every movement could be continuous with every other movement, any more than a random thing can be continuous with any other random thing, but rather those in which the extremities are one. Some things have no extremities at all, while those of others are distinct in form and are homonyms; for how could the extremity of a line and of taking a walk make contact and become one? Movements that are not the same in form or in kind may, it is true, be contiguous (for after running someone might immediately fall ill with a fever), and in a torch-race, for example, we have contiguous but not continuous spatial movement. For what are continuous was posited[237] to be those things whose extremities are one. So movements are contiguous and successive in virtue of the time being continuous, but there can be continuity[238] only in virtue of the movements themselves being continuous, and this is when extremities of both become one. That is why it is necessary for a movement that is unconditionally continuous and one to be the

30 **228^{a}1** 5 10 15 20 25 30 **228^{b}1**

237. 227^{a}10–12.
238. Reading συνεχὲς.

same in form, of one thing, and in one time. In one time in order that there may be no intermediate interval of immobility (for during such an interval there must be rest, and a movement is many and not one if it includes an intermediate interval of rest, so that if a movement is divided by a stop, it is neither one nor continuous; and it is divided, if there is an intermediate interval of [rest] time). But of a movement that is not one in form (even if the time is not intermittent), although the time is one, the movement is distinct in form, [and so is not one]; for a movement that is one must also be one in form, though it is not necessary for a movement that is one in form to be unconditionally one. What it is for a movement to be unconditionally one has now been stated.

Further, a movement is also said to be one when it is complete, whether in kind, in form, or in substance, and, just as in the other cases, completeness and wholeness belong to what is one. Sometimes, though, even an incomplete movement is said to be one, but only if it is continuous.

Further, a movement is said to be one in a way distinct from those just mentioned when it is regular. For an irregular movement seems in a way not to be one movement, while a regular one does seem so, as a rectilinear one does; for an irregular one is divisible [into dissimilar parts]. The difference, though, would seem to be one of the more and less. In the case of every sort of movement, however, there may be regularity and irregularity. For a thing may alter in a regular way, and move spatially in a regular path (for example, in a circle or in a straight line), and it is the same with regard to increase and decrease. And irregularity is sometimes a differentiation in the path of the movement (for a movement cannot be regular if its path is an irregular magnitude—for example, a broken line, a spiral, or any other magnitude that is not such that any random part fits onto any other random part). Sometimes it lies neither in the place[239] nor in the time nor in that to which, but in the manner. For sometimes the movement is differentiated by fastness and slowness; for if its speed remains the same, it is regular, but if it does not, it is irregular. That is why fast and slow are neither form nor differences of movement, because they follow along with all movements, [including] the ones that differ in form. So heaviness and lightness, when they are toward the same thing, are not forms or differences either—for example, of earth in relation to itself, or of fire in relation to itself. Irregular movement, then, while it is one in virtue of being continuous,
229a1 is less so, as is precisely the case with spatial movement in a broken line. And what is less so always involves an admixture of the contrary. But if every movement that is one admits of being both regular and irregular, movements that are contiguous but not the same in form cannot be one and continuous; for how could a movement composed of an alteration and a spatial movement be regular? For if a movement is to be regular, it must fit together.

239. Reading ὁτὲ . . . τῷ ποῦ.

5.5
Contrariety of Movement

Further, we must determine what sorts of movements are contrary to each other, and the same way with rest. And we must determine first whether contrary movements are: from the same thing and to the same thing (for example, one from health and one to health), as coming to be and passing away seem to be; from contraries (for example, one from health and one from disease); to contraries (for example, one to health and one to disease); from a contrary to its contrary (for example, one from health and one to disease); or from a contrary to its contrary and from the latter contrary to the former (for example, one from health to disease and one from disease to health). For movements must be contrary to each other in one or more of these ways; for there is no other way in which they can be opposed.

Movements from a contrary to its contrary (for example, one from health and one to disease) are not contrary movements; for they are one and the same. Yet the being for them is not the same, just as changing from health is not the same as changing to disease. Nor are movements from a contrary, and from *its* contrary, contrary movements; for a movement from a contrary is at the same time a movement to a contrary or to an intermediate (but about this we will speak later[240]). Besides, changing to a contrary rather than from a contrary would seem to be a cause of the contrariety of movements; for the latter is the loss, the former the gain, of contrariety. Also, each movement is said to be what it changes to rather than what it changes from—for example, movement to health we call "becoming healthy," movement to disease "becoming sick."

We are left, then, with movements to contraries and movements from contraries to their contraries. Perhaps it happens that movements to contraries are at the same time movements from contraries, but presumably their being is not the same (I mean that a movement to health is not the same as a movement from disease and a movement from health is not the same as a movement to disease).

Since, though, a change differs from a movement (for movement is change from an underlying subject to an underlying subject), it follows that contrary movements are movements from a contrary to its contrary and from the latter contrary to the former—for example, one from health to disease and one from disease to health. But **$229^{b}1$** it is clear from induction too what sorts of things seem to be contraries; for becoming sick seems contrary to becoming healthy, and learning seems contrary to being led, not through one's own agency, into error (for these are to their contraries; for, as with scientific knowledge, it is possible to acquire error either through one's own agency or through that of another). Also, upward spatial movement and downward spatial movement (for these seem to be contraries with respect to length), that to the right

240. $229^{b}14–21$.

and that to the left (for these seem to be contraries with respect to breadth), and forward and backward (for these too are contraries).

As for what is only to a contrary, it is not a movement but a change—for example, becoming pale but not from something. And in those cases in which there is no contrary, it is the change from the same thing and the change to the same thing that are contraries. That is why coming to be is contrary to passing away, and losing to gaining. These are changes, but they are not movements.

And those movements where there is an intermediate, movements to it must be posited as in a way to a contrary; for the intermediate serves as a contrary for the movement, in whichever direction the change may be—for example, one from gray to white is in a way from black, one from white to gray is in a way to black, and one from black to gray is in a way to white; for in relation to each contrary the intermediate is said to be in a way the other contrary, as was also stated previously.[241]

One movement is contrary to another movement, then, in the following way: when one is from a contrary to its contrary and the other is from the latter contrary to the former.

5.6
Contrariety of Movement and Rest

Since movement seems to have as a contrary not only movement but also rest, we must make some determinations about this. For, unconditionally, a movement is contrary to a movement, while rest too is in fact opposed to it (for it is privation of movement, and the privation of something too is in a way said to be its contrary), and rest of a sort to movement of that sort—for example, rest with respect to place to movement with respect to place. But this, as things stands, is said too simply; for is it movement from it or movement to it that is opposed to remaining at a particular place?

It is surely clear that since movement involves two underlying subjects, what remaining at one of these is opposed to is the movement from it to its contrary, while what remaining at its contrary is opposed to is movement from that to it. At the same time, these two are also contrary to each other; for in fact it would be absurd if there were contrary movements, but there were not opposed states of rest. But these **230a1** are in contraries—for example, rest in health is contrary to rest in disease (but is also opposed to the movement from health to disease; for it would be absurd for it to be opposed to the movement from disease to health—for movement to what a thing is at rest in is rather a coming to rest, at any rate, to the extent that it happens at the

241. 224b30–35.

same time as the movement[242]—but it must be either this movement or the other one); for rest in paleness is not contrary to rest in health.

But for things that have no contraries, of which[243] there is a contrary change from the thing to the thing that is not a movement (for example, the change from being to not being[244]), there is[245] no remaining [as or where they are], although there is absence of change. And if there is some underlying subject, absence of change in its being would be contrary to absence of change in its non-being. But if there is not something that is in a state of non-being, one might raise a puzzle as to what it is that is contrary to absence of change in a thing's being, and whether it is rest. If it is, then either not every state of rest is contrary to a movement or else coming to be and passing away are movements. It is clear, therefore, that we must not say that this absence of change is [a state of] rest, if these are not movements, but that it is similar to it and is absence of change. And its contrary is either nothing at all, either absence of change in the thing's non-being, or the passing away of the thing; for its passing away is change from it and its coming to be is change to it.

One might raise a puzzle as to why it is that while in a change with respect to place both remaining in it and moving may be in accord with nature or contrary to it, in the others this is not so—for example, alteration is in some cases in accord with nature and in others contrary to nature (for becoming healthy is no more in accord with nature or contrary to nature than becoming sick, nor turning pale than turning dark). It is the same way in the case of increase and decrease (for these are not contrary to each other in the sense that one is by nature and the other contrary to nature, nor is one increase contrary to another in this sense). And the same argument applies in the case of coming to be and passing away; for it is not the case that coming to be is in accord with nature and passing away contrary to nature (for growing old is in accord with nature), nor, in coming to be, do we see one case in accord with nature and in another contrary to nature.

Or if what is by force is contrary to nature, is passing away by force contrary to nature and as such contrary to passing away in accord with nature? Are there, then, also some comings to be that are by force and not allotted, which are as such contrary to those that are in accord with nature, as well as increases and decreases by force—for example, the rapid growth to maturity due to luxury, and the rapid ripening of seeds, even when not closed up? And how is it in the case of alterations? Or is it the same? For some might be by force, while others are natural—for example, those patients who get rid of their fever not during the days of the crisis and those who do so during the days of the crisis; the first lot alter contrary to nature, the second in accord with nature. But, it may be objected, we will then have passings away that are contrary to each other, not to comings to be. And what exactly is there to prevent their being in

242. Reading ᾗ̔.
243. Reading ὧ̔ν.
244. Reading εἰς τὸ μὴ ὄν.
245. Omitting καὶ.

a way so? For in fact if one is pleasant and the other painful it would. So one passing away will be contrary to another not unconditionally, but insofar as one is of this sort and the other of that sort.

In general, movements and states of rest are contraries in the way we just described—for example, movement upward and rest up above are contrary to movement downward and rest down below; for up and down are contraries belonging to place. And as for the spatial movements, the one that is by nature upward is that of fire, the one by nature downward is that of earth, and the spatial movements of these are contraries. In the case of fire, spatial movement upward is by nature, while the one downward is contrary to nature. And the one that is in accord with nature for it is certainly contrary to the one that is contrary to nature. And states of remaining are similar; for remaining up above is contrary to movement from up above downward, and to earth this remaining occurs against nature and this movement in accord with nature. So the remaining that is contrary to movement is the remaining contrary to the nature of the thing that is contrary to the movement that is in accord with its nature; for in fact its movement contrary to its nature is likewise contrary to it; for one of its movements will be in accord with nature, the upward or the downward, the other contrary to nature.

There is a puzzle as to whether there is a coming to be of every state of rest that is not eternal, and if it is a coming to a stop. If so, then there must be a coming to be of what is remaining contrary to nature—for example, a coming to be of earth's remaining up above. Therefore, at the time that it was by force in spatial movement upward, it was coming to a stop. But what is coming to a stop [in accord with nature] seems to be in spatial movement that is always faster, while with what is in spatial movement by force it seems to be the contrary. Without coming to be at rest, therefore, it will be at rest. Further, a thing's coming to a stop seems to be wholly the same as its being in spatial movement to its own place, or to occur at the same time as it.

There is also a puzzle as to whether remaining in a particular place is contrary to movement from that place; for when a thing is in the process of moving from this and leaving it behind, what it is leaving behind still seems to belong to it, so that if a state of rest is itself contrary to the process of moving from there to its contrary, then contraries will belong to the thing at the same time. But is the thing somehow at rest only if it still remains [as or where it was]? And, in general, is a part of the thing that is in movement in that initial place, while another part is at the one to which it is changing? That is why what is contrary to a movement is a movement rather than a coming to rest.

Concerning movement and rest, then, what way each is one and which are contrary to which, has been stated.

{One might also raise a puzzle, however, about coming to a stop, as to whether in the case of movements that are contrary to nature too there are opposed states of rest. But if this were not so, it would be strange; for a thing may remain [as or where it is] by force (so that there would be something in a non-eternal state of rest without

having come to be in it). But it is clear that this will be so; for just as a thing may be in movement contrary to nature, so too it may be at rest contrary to nature. And since in the case of some things there is movement in accord with nature and contrary to nature (for example, in the case of fire, upward movement is in accord with nature, while downward movement is contrary to nature), is it the latter movement that is contrary to the former one or earth's downward movement (for it spatially moves downward in accord with nature)? Or is it clear that both are, but not in the same way? Instead, earth's downward movement is contrary to fire's upward movement as one movement that is in accord with nature is contrary to another movement that is in accord with nature, while fire's upward movement is contrary to its downward movement as a movement in accord with nature is contrary to a movement contrary to nature. It is the same way in the case of a thing's remaining as or where it is. But perhaps a movement is also opposed in a way to a state of rest.}[246]

BOOK 6

6.1
Every Continuum Consists of Continuous and Divisible Parts (1)

If continuity, making contact, and successive are defined as above,[247] with things being continuous if their extremities are one, making contact if their extremities are together, and successive if there is nothing of the same kind intermediate between them, then a continuous thing cannot be composed of indivisibles—for example, a line of points, if indeed a line is continuous and a point indivisible. For the extremities of a point can neither be one (for there can be no extremity of an indivisible thing as distinct from some other part) nor together (for what has no parts can have no extremities; for the extremity and what it is an extremity of are distinct).

Further, if what is continuous is composed of points, these points must be either continuous or making contact with each other: and the same argument applies in the case of all indivisibles. But in fact they cannot be continuous because of the argument just stated. On the other hand, when one thing makes contact with another, either **231b1** whole makes contact with whole, part with part, or part with whole. But since what is indivisible is without parts, they must make contact as whole with whole. But if they make contact as whole with whole, there will not be a continuous thing. For what is continuous has distinct parts, and may be divided into these, which are then distinct in this way, that is, separated by place.

But then a point cannot succeed a point either, or a now a now, so that a length is composed of points or a time of nows; for things are successive if there is nothing

246. This paragraph is missing from some manuscripts and should perhaps be secluded.
247. 5.3.

of their own kind intermediate between them, while what is intermediate between points is always a line, and between nows [an interval of] time.

Further, each of the two would then be divided into indivisibles, if indeed it is divisible into the parts of which it is composed. But no divisible thing, as we saw, is divisible into things without parts. Nor can there be anything of any other kind that is intermediate. For it will be either indivisible or divisible, and if divisible, either into indivisibles or into things that are always divisible, in which case it will be continuous.

But it is evident too that everything that is continuous is divisible into things that are always divisible; for if it will be divisible into indivisibles, there will be an indivisible making contact with an indivisible; for the extremities of things that are continuous with each other are one and make contact.

The same argument applies to magnitude, time, and movement: either all of these are composed of indivisibles and are divisible into indivisibles, or none are. This is clear from the following. For if a magnitude is composed of indivisibles, the movement along that magnitude will also be composed of an equal number of indivisible movements—for example, if the magnitude ABC is composed of the indivisibles A, B, C, each corresponding part of the movement DEF of O traversing ABC is indivisible. If, then, where there is movement there must be something in movement, and where there is something in movement there must be movement, then what is being moved will also be composed of indivisibles. O, then, traversed A with the movement D, B with the movement E, and similarly C with the movement F. What is in movement from one place to another cannot at the same time be moving and have moved to where it was moving when it was moving (for example, if someone[248] is taking a walk to Thebes, he cannot at the same time be taking a walk to Thebes and have taken a walk to Thebes). And, as we saw, O traverses A, which is without parts, in virtue of the presence of movement D. So, if O passed through A after being in the process of traversing it, then its movement must be divisible (for at the time O was in the process of traversing, it was neither at rest nor had passed through but was in the intermediate). On the other hand, if at the same time O is traversing and has traversed, then what is taking a walk will, at the time it is taking a walk, have taken the walk, and will be there—that is, it will have moved to the place to which it is moving. And if a thing is traversing the whole of ABC, and its movement is the movements D, E, and F, and if it is not in movement at all in A, which is without parts, but has moved in it, then its movement will not be composed of movements but of instantaneous movements, that is, it will occur in virtue of a thing's having moved without being in movement; for it has traversed A without traversing it. So it will be possible for a thing to have taken a walk without ever walking; for it will have taken a walk in A without taking a walk in it.

248. Reading τις.

If, then, everything must be either at rest or in movement, and O is at rest in each of A, B, and C, it follows that a thing can be continuously at rest and at the same time in movement. For, as we saw, O is in movement in the whole of ABC and at rest in any part of it, and so in the whole. Also, if the indivisibles that compose DEF are movements, it would be possible for a thing in which movement is present not to be in movement but at rest, while if they are not movements, it would be possible for a movement not to be composed of movements.

And if length and movement are indivisible, it is likewise necessary for time too to be so, that is, to be composed of indivisible nows; for if every [length or movement] is divisible, and what is traveling with equal speed will traverse a smaller length in less time, then the time will be divisible too. And if the time in which a thing is in spatial movement through A is divisible, A will be divisible too.

6.2
Every Continuum Consists of Continuous and Divisible Parts (2)

Since every magnitude is divisible into magnitudes (for we have proved[249] that it is impossible for anything that is continuous to be composed of indivisibles, and every magnitude is continuous), it necessarily follows that the faster of two things traverses a greater magnitude in an equal time, an equal magnitude in less time, and a greater magnitude in less time, which is just the way faster is defined by some thinkers.

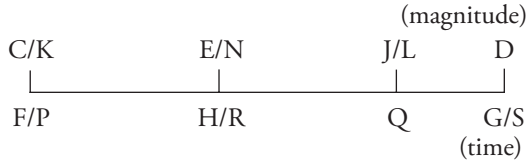


Fig. 1

For let A be faster than B. Since, therefore, of two things, the one that changes earlier is faster, in the time in which A has changed from C to D (for example, the time FG), during that time B will not yet have arrived at D but will fall short of it, so that in an equal time A will traverse a greater magnitude [Fig. 1]. But then it will also traverse a greater one in less time; for in the time it takes A to arrive at D, B, being the slower, has arrived at E. Then since A takes the whole time FG to arrive at D, it will have **232b1** arrived at E in less time than that, let us say in FH. On the one hand, then, CJ, which A has traversed, is greater than CE, and, on the other hand, the time FH is less than the whole time FG, so that A traverses a greater magnitude than B in less time.

It is also evident from this that the faster will traverse an equal magnitude in less time than the slower. For since it traverses a greater magnitude in less time than the

249. 6.1.

slower, and since taken by itself it traverses a greater magnitude in more time than it does a lesser, for example, KL[250] in more time than KN, the time PQ in which it traverses KL will be more than the time PR in which it traverses KN. So, if the time PQ is less than the time PS taken by the slower to traverse KL, the time PR will also be less than the time PS; for PR is less than PQ, and what is less than what is less than a thing is itself less than the latter. So the faster will traverse an equal magnitude in less time than the slower.

Further, since everything must move in a time that is equal to, less than, or more than that of something else, and what moves in more time is slower, what moves in an equal time is of equal speed, and since the faster is neither of equal speed nor slower, then what is faster will move in a time that is neither equal nor more. It remains, then, that it moves in less time. So it is necessary again that the faster traverse an equal magnitude in less time than the slower.

Since every movement is in time and every time is one in which something can move, and since everything that is in movement may be moving faster or slower, in every time there may be faster or slower movement. This being so, it is also necessary for time to be continuous. By "continuous" I mean what is divisible into things that are always divisible. For if this is what continuity is assumed to be, then time must be continuous. For since it has been proved that the faster will traverse an equal magnitude in less time [than the slower], let A be faster and B slower, and let the slower traverse the magnitude CD in time FG [Fig. 2].

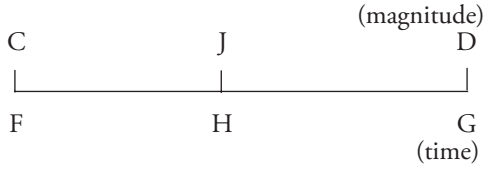


Fig. 2

It is clear, therefore, that the faster will traverse the same magnitude in less time than this. And let it have moved in the time FH. Again, since the faster has traversed the whole of CD in time FH, the slower will in the same time traverse a lesser magnitude, **233a1** and let this be CJ. And since B, the slower, has traversed CJ in the time FH, the faster will traverse it in less time, so that the time FH will again be divided. And if it is divided, the magnitude CJ will also be divided, and in the same ratio. But if the magnitude is divided, so too is the time. And this will always be so if we take the slower after the faster and the faster after the slower, and make use of the same demonstration at each stage; for the faster will divide the time and the slower the length. If, then, this conversion always holds true, and at every turn of the conversion there is a division, it is evident that all time must be continuous. And at the same

250. The reason for the change in notation is unclear.

time it is clear that every magnitude is also continuous; for time and magnitude are divided by divisions that are the same and equal.

Further, it is evident on the basis of the arguments that are customarily stated that if indeed time is continuous, magnitude is continuous too, if indeed in half the time a thing traverses half the distance, and, in general, if in less time it traverses less; for the divisions of the time and of the magnitude will be the same. And if either one of these is unlimited, so is the other, and the one is unlimited in the same way as the other, and the other as the one—for example, if time is unlimited with respect to its extremities, length too is so with respect to its extremities; if with respect to division, length too is so with respect to division; and if with respect to both, magnitude is also so with respect to both.

That is why Zeno's argument[251] is false when it assumes that it is impossible to traverse unlimited things or to touch unlimited things each by each in a limited time. For there are two ways in which length, time, and, in general, anything continuous are said to be unlimited: with respect to division or with respect to their extremities. Therefore, while it is not possible in a limited time to make contact with things that are unlimited in quantity, it is possible if they are unlimited with respect to division; and in fact time itself is unlimited in this way. So it is in an unlimited time and not in a limited one that traversing the unlimited takes place, and contact with things that are unlimited is made by unlimited times, not by limited ones.

Neither, indeed, can an unlimited magnitude be traversed in a limited time, nor a limited one in an unlimited time. Instead, if the time is unlimited, the magnitude will also be unlimited, and if the magnitude is unlimited, the time will be too. For let AB be a limited magnitude, C an unlimited time, and let a limited interval CD of the time [C] be taken. In this interval a thing will traverse a certain segment of the magnitude, and let BE be the segment thus traversed. And this will either measure AB exactly, fall short of it, or exceed it. It makes no difference, in fact, which it is; for if a magnitude that is equal to BE will always be traversed in an equal time, and BE measures the whole magnitude AB, then the whole time taken to traverse AB will be limited; for it will be divided into equal [parts] as the magnitude also is.[252]

Further, if not every magnitude is traversed in an unlimited time, but it is possible to traverse some magnitude—for example, BE—in a limited time, and if this BE measures the whole, and if an equal magnitude is traversed in an equal time, it follows that the time will be limited as well. And it is evident that BE will not be traversed in an unlimited time, if the time is taken to be limited in one of the two directions;[253] for as a part of AB is traversed in less time [than the whole], this time must be limited, since a limit—at any rate in one direction—exists. And if the length is unlimited and the time limited, the demonstration will be the same.

251. $239^{b}11–13$.
252. Reading ὡς καὶ τὸ μέγεθος.
253. Reading ἐπὶ θάτερον.

It is evident, then, from what has been said that neither a line, a plane, nor, in general, anything continuous can be indivisible, not only because of what has just been said, but also because otherwise the indivisible will turn out to be divisible. For since in every interval of time there may be faster and slower movement, and the faster traverses a greater length in an equal time,[254] it is possible for it to traverse a length that is twice, or one and a half times, as great as that traversed by the slower, for this may be the ratio of their respective speeds. Let the faster, then, traverse in the same time a magnitude that is one and a half times that traversed by the slower, and let the magnitude traversed by the faster be divided into three indivisible parts AB, BC, and CD, and that traversed by the slower into the two EF and FG. Then, the time will also be divided into three indivisible parts; for an equal magnitude will be traversed in an equal time. Let the time be divided into JK, LK, and LM [Fig. 3]. Again, since the slower has traversed EFG, the time will also be divided into two.

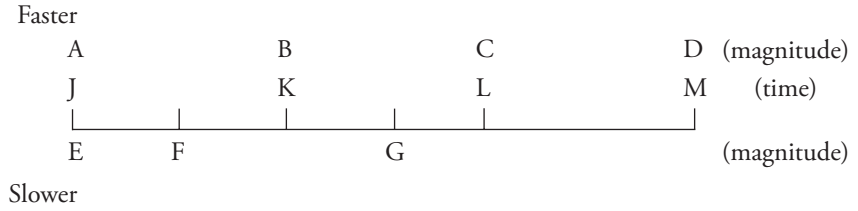


Fig. 3

Therefore, the indivisible will be divided, and what is without parts will be traversed not in an indivisible but in a greater time.

It is evident, then, that nothing continuous is without parts.

6.3
The Now Is Indivisible and Nothing Is in Movement or at Rest in It

It is also necessary for the now—said not with reference to something else, but intrinsic and primary—to be indivisible, and as such to be present in every [interval of] time. For there is an extremity of the past (no part of the future lying on this side of it), and again one of the future (no part of the past lying on this side of it). It, then, we have said,[255] is a limit of both. And if it is proved to be such intrinsically[256] and [for the two limits] to be the same, it will at once also be evident that it is indivisible.

It is necessary for the now that is the extremity of both times to be the same; for if they were distinct, the one could not be successive with the other, because nothing

254. Omitting δὲ.
255. 222ᵃ12. Reading ἔφαμεν.
256. Retaining καθ' αὑτὸ.

continuous can be composed of things without parts, while if the one is separate from the other, there will be a time intermediate between them; for everything continuous is such that there is something synonymous intermediate between its limits. But then if the intermediate thing is time, it will be divisible; for all time has been proved[257] to be divisible. So the now will be divisible. But if the now is divisible, some part of the past will be in the future and some part of the future in the past; for that at which it would be divided is what will determine what is past and what is future time. At the same time, the now would not be something intrinsic, but with reference to something else;[258] for the division will not be intrinsic. In addition, part of the now will be in the past and part in the future, and it will not always be the same one that is past or future. Indeed, the now will not be the same either; for the time is divisible at many points. So, if these features cannot belong to the now, the same now must be in each of the two times it divides. But then, if it is the same, it is evident that it is also indivisible; for if it is divisible, once again the same things will follow as before.

It is clear from what has been said, therefore, that there is something in time that is indivisible, and this we say is the now.

And that nothing is in movement in the now is evident from the following. For if this is possible, then it is possible for there to be faster and slower movement in the now. Let N, then, be the now, and let the faster have moved a distance AC in it. Then the slower will in the same now move a distance less than AC—let it be AB. But since the slower moved the distance AB in the whole now N, the faster will move it in less time, so that the now N will be divided. But we took it to be indivisible. There is not, then, anything that is in movement in the now.

But then nothing is at rest in the now either; for what is at rest, we have said,[259] is what naturally moves but is not in movement when, where, or in the way it would naturally be so. So, since nothing is naturally in movement in the now, it is clear that nothing is at rest in it either.

Further, if the now is the same in both of the times [it divides], and it is possible for a thing to be in movement throughout the whole of one time and at rest throughout the whole of the other, and if what is in movement throughout the whole of a time will be in movement in any part of it in which it is naturally in movement, and what is at rest will likewise be at rest, then it follows that the same thing will be at the same time at rest and in movement; for both the times have the same extremity: the now.

Further, we say that a thing is at rest when it and its parts are in the same state now as previously. But in the now there is no previously, so there is no being at rest either.

Both the movement of what is in movement, therefore, and the being at rest of what is at rest must be in time.

257. 232^{b}19–233^{a}12.
258. 222^{a}10–24.
259. 226^{b}12–16. Reading ἐλέγομεν.

6.4
Modes of Divisibility

Also, everything that is changing must be divisible. For since every change is from something to something, and when a thing is in what it has changed to, it is no longer changing, and when both it itself and all its parts are in what it changes from it is not[260] changing (for what keeps in the same state, both itself and its parts, is not changing), it is necessary that part of what is changing must be in what it is changing from and part in what it is changing to; for it cannot be in both or in neither of the two. By "what it is changing to" I mean the first one with respect to the change—for example, gray not black, if it is changing from white; for it is not necessary for what is changing to be at either of the extremes. It is evident, then, that everything that is changing will be divisible.

Movement is divisible in two ways. One way is with respect to the time, another is with respect to the movements of the parts of what is in movement—for example, if the whole AC is in movement, its parts AB and BC will also be in movement. Let the movement of the parts, then, be DE for AB and EF for BC. It is necessary, then, for the whole DF to be the movement of AC. For it will be in this movement [DF], if indeed each of its parts is moving with its respective movement (since the one part is not in movement with respect to the movement of the other). So the whole movement is the movement of the whole magnitude.

Further, if every movement is the movement of something, and the whole movement DF is neither the movement of either of the parts (for of the parts it is the respective parts of the movement) nor of anything other than them (for a whole movement is of a whole thing, and the parts of the parts, and the parts of the movement are the movements of AB and BC and nothing else; for, as we saw,[261] a movement that is one cannot be the movement of more than one thing), then the whole movement will be that of the magnitude of ABC.

Further, if the movement of the whole is something else, for example, HI, the movements of each of its parts may be subtracted from it. And these will be equal to DE and EF; for the movement of what is one is one. So, if the whole movement HI is divided into the movements of the parts, HI will be equal to DF. On the other hand, if there is a remainder, for example, JI, this will be a movement of nothing (for it can be the movement neither of the whole nor of the parts, because the movement of what is one is one, nor of anything other than them; for a movement that is continuous must be of things that are continuous), and likewise if there is an excess with respect to the division. So, if this is impossible, it is necessary for the movement HI to be the same as and equal to DF.

260. Reading οὐ.

261. The reference is unclear, but is perhaps to 227b20–228a6.

This, then, is what division of movement with respect to the movement of the parts is. And it must be applicable to everything that is divisible into parts.

Another division is with respect to time; for since every movement is in time, and all time is divisible, and in less time the movement is less, it is necessary for every movement to be divisible with respect to time. But since everything that is in movement is in movement in a certain respect and for a certain time and the movement is of the entire thing, it is necessary for there to be the same divisions of the time, the movement, the being-in-movement, the thing that is in movement, and what the movement is with respect to (although the divisions of what the movement is with respect to are not all alike; rather, those of quantity[262] are intrinsic, those of quality coincidental).

For let the time in which a thing is in movement be A, and the movement B. If, then, in all the time the thing completed the whole movement, in half the time it completed less of it, and, if this time is divided, less of it again, and so on always in the same way. Similarly, if the movement is divisible, the time will also be divisible; for if the whole movement is in all the time, the half is in half the time, and less again in less of it.

And the being-in-movement is also divisible in the same way. For let C be the whole being-in-movement. The being-in-movement, then, that corresponds to half the movement will be less than the whole, and the one that corresponds to half of the half will be less again, and so on always in the same way. And by setting-out the beings-in-movement corresponding to each of the two movements, for example, corresponding to DC and CE,[263] we may also say that the whole being-in-movement will be that with respect to the whole movement (for if some other being-in-movement does so, more than one being-in-movement will correspond to the same movement)—[which can be proved] in the same way as we proved that the movement of a thing is divisible into the movements of its parts; for if we take the beings-in-movement as corresponding to each of the two movements, the whole will be continuous.

The divisibility of the length will also be proved in the same way, as, in general, will be that of everything with respect to which there is change (although some of these are coincidentally divisible, because the thing that is changing is so); for when one is divided all will be divided. So too in the issue of their being limited or unlimited, they will all alike be either one or the other. And in most cases the fact that all the things we looked at were divisible or unlimited followed along with the fact that the thing that is changing is so; for divisibility and unlimitedness belong directly to the thing that is changing. That divisibility does so was proved previously;[264] that unlimitedness does so will be made clear in what follows.[265]

262. Reading ποσοῦ.
263. Parts of C.
264. $234^{b}10–20$.
265. 6.7.

6.5
Issues Concerning Change (1)

Since everything that changes changes from something to something, it is necessary for what has changed, at the moment when it has first changed, to be in what it has changed to. For what is changing gets rid of and leaves behind what it is changing from, and leaving behind and changing are either the same or leaving behind follows along with changing. And if leaving behind follows along with changing, having left behind follows along with having changed; for in each pair there is a similar relation between its two members.

Since, then, one sort of change is with respect to contradiction, when a thing has changed from non-being to being, it has left non-being behind. Therefore, it will be in being; for everything must either be or not be. It is evident, then, that in change with respect to contradiction what has changed must be in what it has changed to. And if this holds in this sort of change, it will also hold in the others; for what holds in the case of one sort, holds also in that of the others.

Further, if we take each sort separately it is also evident that this is so, if indeed what has changed must be somewhere or in something. For since it has left behind what it has changed from and must be somewhere, it will be either in what it has changed to or in something other than it. If, then, what has changed to C is in something other than C, for example, B, then it is changing again from B to C; for C was not contiguous to B, for[266] the change is continuous. So what has changed, at the moment when it has changed, is changing to what it is changing to. But this is impossible. Therefore, what has changed must be in what it has changed to. It is also evident, then, that what has come to be, at the moment when it has come to be, will be, and that what has passed away will not be; for what was said applies universally to every sort of change, and is most of all clear in that with respect to contradiction. It is clear, therefore, that what has changed, at the moment when it has first changed, is in what it has changed to.

But the primary [time] in which what has changed has changed must be indivisible. By "primary" I mean that it is not in virtue of some other thing than it that the thing is such-and-such. For let the time AC be divisible, and let it be divided at B. If, then, the thing has changed in AB or again in BC, AC cannot be the primary time in which it has changed. If, on the other hand, it were changing in each (for it must either have changed or be changing in each of them), it would also be changing in the whole AC. But it has [already] changed in AC. And the argument is the same even if the thing is changing in one part and has changed in the other; for then there will be something prior to what is primary. So the time in which the thing has changed must not be divisible. It is also evident, then, that the time in which what has passed away has passed away or in which what has come to be has come to be is indivisible.

266. Reading τῷ B, ἡ γὰρ.

But something is said to be the primary time in which a thing has changed in two ways, on the one hand, when it is the primary one in which the change has been completed (for then it is true to say that it has changed), and, on the other hand, when it is the primary one in which the changing started. What is said to be primary, then, with reference to the end of the change does really exist (for a change admits of being completed, and there is an end of change, and it was proved[267] to be indivisible because it is a limit). But what is said to be primary with reference to the starting-point does not exist at all; for there is no starting-point of a change nor a primary part of the time in which a thing started to change.[268] For let BC be a primary part. It is certainly not indivisible; for otherwise the nows would be contiguous. Further, if the thing is at rest in all of the time AB [immediately preceding BC] (for let it be posited that it is at rest), it is also at rest in B. So, if BC is without parts, the thing will be at rest and have changed at the same time; for it is at rest in B and has changed in C. But, since BC is not without parts, it must be divisible, and the thing must have changed in any part of it whatever; for since BC is divided, if it has changed in neither of the two parts that it is divided into, it has not changed in the whole of it either; while, if it is changing in both, it is also changing in all of it; and if it[269] has changed in one of the two, it has not changed in the whole primarily. So it must have changed in any part of it whatever. It is evident, therefore, that there is no primary time in which it has changed; for the divisions [of time] are unlimited.

Of what has changed, there is also no primary part that has changed. For let DZ be the primary part of DE that has changed; for every changing thing has been proved[270] to be divisible. And let the time in which DF has changed be HI. If, then, DF has changed in the whole time, what[271] has changed in the half will be less than and so prior to DF, and there will be another part again that is prior to this, and another, and so on always in the same way. So of what has changed there will be no primary part that has changed.

It is evident, then, from what has been said that there is no primary part either of what changes or of the time in which it changes.

But with the thing itself that changes, or [better] what a thing changes with respect to, it will no longer be the same way. For three things are mentioned with regard to change: what changes, what it changes in, and what it changes to—for example, the human being, the time, and the pale. The human being and the time are divisible, but in the case of the pale there is another account. Except that they are all indeed coincidentally divisible; for what the pale or the quality coincides with is divisible; since of those that are said to be intrinsically and not coincidentally divisible there will be no primary part that changes—for example, there will be none in magnitudes. For

267. 235^{b}30–236^{a}5.
268. Reading μετέβαλεν.
269. Reading εἰ δ'.
270. 234^{b}10–20.
271. Reading τὸ.

let AC be a magnitude, and let it have moved from A to a primary point B.[272] Then, if AB is indivisible, a thing without parts will be contiguous to a thing without parts, while if it is divisible, there will be something prior to B to which the magnitude has changed, and something else again prior to that, and so on always in the same way, because the process of division can never come to an end. So there will be no primary one to which it has changed. It is likewise, too, in the case of quantitative change; for here too the change is in something continuous.

It is evident, then, that only in movement with respect to quality can there be intrinsic indivisibility.

6.6
Issues Concerning Change (2)

But since everything that changes changes in time, and is said to be changing in time both as changing in a primary time and as doing so with respect to another time (for example, when we say that it changes in a particular year because it changes in a particular day of it), if what changes is changing in a primary time, it must be changing in any part of it whatever. This is clear even from the definition (for "primary" was meant[273] in this way), but it is also evident from the following. Let the primary time, in which what is in movement is in movement, be VQ, and let it be divided at J; for all time is divisible. In the time VJ the thing either is in movement or is not in movement, and likewise in turn in the time JQ. If, then, it is in movement in neither of the two, it will be at rest in the whole (for to be in movement in it when in movement in none of its parts is impossible). But if it is in movement in only one of the two, then VQ cannot be the primary time in which it is in movement; for its movement will be with respect to a time other than VQ. Therefore, it must be in movement in any part whatever of VQ.

Now that this has been proved, it is evident that everything that is in movement must have been in movement previously. For if in the primary time VQ the thing has traversed the magnitude JK, then in half that time a thing that is moving with the same speed and that started its movement at the same time will have traversed half of it. But if this second thing, which is traveling at the same speed, has traversed
237a1 a certain magnitude in a certain time, the first thing must have traversed the same magnitude [in the same time], so that what is in movement must have been in movement previously.

272. Think of AC as a continuous line that has grown in length from A to C (at which point it has the magnitude in question), and suppose that it has done so by first reaching some point B. If AB is indivisible, A and B will both be indivisible, without parts, and contiguous—which is impossible. If AC is divisible, say at X, then AX not AC will be the first part of AB to achieve the magnitude in question, and so on.

273. 235b33–34.

Further, if we say that a thing has moved in all the time VQ—either in the whole of it or, in general, in any part whatever—by taking its extreme now (for it is this that defines it, and what is intermediate between nows is time), it would likewise be said to have moved in the others. But the extremity of the half is a division. So the thing will have moved both in half the time and, in general, in any part of it whatever; for as soon as any division is made there is always a time defined by the nows. If, then, all time is divisible, and what is intermediate between nows is time, everything that is changing must have changed an unlimited number of times.

Further, if what is changing continuously, without having passed away or having ceased changing, must have been changing or have changed in any part of the time whatever, and since it cannot be changing in a now, it must have changed with respect to each of the nows. So, if the nows are unlimited in number, everything that is changing will have changed an unlimited number of times.

And not only must what is changing have changed, but what has changed must also previously have been changing; for everything that has changed from something to something has changed in an interval of time. For let a thing have changed from A to B in a now. Then the now in which it has changed cannot be the same as the one in which it is in A (for otherwise it would be in A and B at the same time); for we have proved previously[274] that what has changed, at the moment when it has changed, is not in what it has changed from. But if it is in another now, there will be an interval of time intermediate [between the two nows]; for, as we saw,[275] nows are not contiguous. Since, then, it has changed in an interval of time, and all time is divisible, in half that interval it must have made another change, and in half the half another again, and so on always in the same way, so that it must have been changing previously.

Further, what has been said is more evident in the case of magnitude, because the magnitude in which what is changing changes is continuous. For let a thing have changed from C to D. Then if CD is indivisible, a thing without parts will be contiguous to a thing without parts. But, since this is impossible, what is intermediate between them must be a magnitude and must be divisible without limit into magnitudes. So it must previously have been changing to the latter. Therefore, everything that has changed must previously have been changing. The same demonstration, indeed, also applies to what is not continuous—for example, in the case of contraries and in that of contradictories; for the time in which the thing has changed may be taken, and then we may state the same argument again. So what has changed must have been changing and what is changing must have changed, and there will be a having changed previous to a changing, and a changing previous to a having changed, and at no time can one be taken as primary. And the cause of this is that no thing

274. $235^{b}6$–13.
275. $218^{a}18$–19, $231^{b}6$–10.

without parts can be contiguous to a thing without parts; for the division is without limit, just as in increasing and decreasing lines.[276]

It is also evident, then, that what has come to be must previously have been coming to be, and that what is coming to be must previously have come to be (that is, the ones that are divisible and continuous[277]), although it is not always of what the thing is coming to be that this holds, but sometimes it is something else, for example, some part of it, like the foundation of a house. Likewise in the case of what is passing away and what has passed away; for in what comes to be and in what passes away something unlimited is immediately present precisely because they are continuous. And a thing can neither be coming to be without having come to be nor have come to be without coming to be, and likewise too in the case of passing away and having passed away; for having passed away is always previous to passing away, and passing away to having passed away.

It is evident, then, that what has come to be must previously have been coming to be, and that what is coming to be must previously have come to be; for every magnitude and every interval of time is divisible without limit.

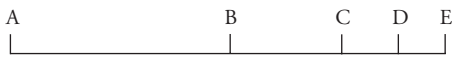
So in whatever [time or magnitude] a thing may be, it cannot be in it as in a primary one.

6.7
The Limitedness or Unlimitedness of Movement, Magnitude, and of What Is Moved

Since everything in movement is moving in time, and in a longer time covers a greater magnitude, it cannot cover a limited magnitude in an unlimited time, if it is not always moving in the same movement and in some iteration of it,[278] but rather covers all of the magnitude in all of the time.

It is clear that if a thing is moving with equal speed, it must cover a limited magnitude in a limited time (for if a part is taken that will measure the whole, the thing will have covered the whole magnitude in as many equal intervals as there are parts of the movement, so since the parts are limited, both each individually in magnitude and all collectively in number, the whole time will also be limited; for it will be so-and-so

276. Bisect a line AE at B, BD at C, and CE at D:



The result is an increasing series of lines (AB, AC, AD, . . .), each of which is longer than its predecessor, and a decreasing series (AB, BC, CD, . . .), each of which is shorter than its predecessor.

277. *Met.* 1027a29–30.

278. As in unlimited movement in a circle.

many times so-and-so much, equal to the time of a part multiplied by the number of the parts).

And if the speed is not equal it makes no difference. For let AC be a finite extension which the thing has traversed in an unlimited time, and let the unlimited time be DE. If, then, one part of the extension must have been covered before another part **238^{a}1**
(and this is clear, because in the earlier and in the later part of the time a distinct part has been covered; for in a longer time a distinct part will always have been covered, whether the thing changes with equal speed or not with equal speed, and whether the speed of the movement increases, diminishes, or remains the same, this is no less so), let us then take AB, a part of the extension AC, that will measure AC. This part, then, was traversed in a certain limited part of the unlimited time; for it cannot be in an unlimited one; for the whole movement [AC] took an unlimited one. And if I again then take a distinct part equal to AB, it too must have been traversed in a limited time; for it was the whole movement that took an unlimited one. And if I go on taking parts in this way, then, since no part of what is unlimited will measure what is unlimited (for the unlimited cannot be composed of a limited number of parts, whether equal or unequal, because equal or unequal parts that are limited in number and magnitude will be measured by some one unit, and so, whether they are equal or unequal, will nonetheless be definite in magnitude), and since the limited extension AC is measured by so-and-so many times AB, AC would be traversed in a limited time. And it is the same way with coming to rest. So it is impossible for one and the same thing to be always coming to be or always passing away.

The same argument will also prove that in a limited time what moves cannot be either in an unlimited movement or in an unlimited coming to rest, whether it is moving with a regular or an irregular movement. For if a certain part is taken that will measure the whole time, in it some quantity of the magnitude will be traversed and not the whole (for the whole will be traversed in all of the time), and again in another equal part another quantity, and likewise in each part, whether equal or unequal to the one at the start (for this makes no difference, provided only that each is limited); for it is clear that when the time is exhausted, the unlimited magnitude will not be, since the process of subtraction is limited both in the quantity [of each subtraction] and in the number of subtractions. So the unlimited magnitude will not be traversed in a limited time. And it makes no difference whether the magnitude is unlimited in one of the two directions or in both; for the argument will be the same.

These things having been demonstrated, it is evident that neither can a limited magnitude traverse an unlimited magnitude in a limited time, due to the same cause; for in part of the time it will traverse a limited magnitude, and in each part it will do likewise, so that in the whole time it will traverse a limited magnitude.

And since a limited magnitude will not traverse an unlimited one in a limited time, it is clear that neither will an unlimited one traverse a limited one; for if the **238^{b}1**
unlimited one can traverse the limited one, the limited one must also traverse the unlimited one. For it makes no difference which of the two is the one in movement;

for either way the limited traverses the unlimited. For when the unlimited magnitude A is in movement, a part of it—for example, CD—will traverse the limited magnitude B, and then another, and then another, and so on always in the same way. So the unlimited magnitude A will have traversed the limited magnitude B at the same time as the limited magnitude B will have traversed the unlimited A; for perhaps there is no other way possible for the unlimited one to have traversed the limited one than by the limited one traversing the unlimited one, either by being in spatial movement over it or by measuring it. So since this is impossible, the unlimited one cannot traverse the limited one.

But then neither does the unlimited one traverse the unlimited one in a limited time; for if it traverses the unlimited one, it will also traverse the limited one; for the limited one is contained in the unlimited one. Further, by taking the time, the demonstration will be the same.

Since in a limited time, then, the limited one does not traverse the unlimited one, nor the unlimited the limited, nor the unlimited the unlimited, it is evident that neither will there be unlimited movement in a limited time; for what difference does it make whether it is the movement or the magnitude that we posit as being unlimited? For if either of the two is unlimited, the other must be so as well; for all spatial movement is in a place.

6.8
Rest and Coming to Rest

Since everything that is either naturally in movement or naturally at rest is so when, where, and in the way that is natural, what is coming to a stop, when it is coming to a stop, must be in movement; for if it is not in movement, it is at rest, but it is not possible for what is at rest to be coming to be at rest. This having been demonstrated, it is also evident that coming to a stop must be in time (for what is in movement is in movement in time, and what is coming to a stop was proved to be in movement, so it is necessary for coming to a stop to be in time). Further, what we say is faster or slower is in time, and coming to a stop may be faster or slower.

And what is coming to a stop must be coming to a stop in any part whatever of the primary time in which it is coming to a stop. For if it is coming to a stop in neither of the two parts that the time may be divided into, it will not be doing so in the whole time either, so that what is coming to a stop will not be coming to a stop. On the other hand, if it is coming to a stop in only one of the two parts, then the primary time in which it is coming to a stop will not be the whole time; for it will be coming to a stop with respect to something else—as we also stated previously in the case of what is in movement.

And just as there is no primary time in which what is in movement is in movement, so too there is not one in which what is coming to a stop is coming to a stop;

for neither in the case of being in movement nor in that of coming to a stop is there a primary one. For let AB be the primary time in which a thing is coming to a stop. Then AB cannot be without parts (for there is no movement in what is without parts, because part of it[279] has to have moved, and what is coming to a stop has been proved[280] to be in movement). But then if AB is divisible, the thing is coming to a stop in any part of it whatever; for we have proved previously[281] that it is coming to a stop in any part whatever of the primary time in which it is coming to a stop. Since, then, what a thing is primarily coming to a stop in must be an interval of time, and not something indivisible, and since all time is divisible without limit, there cannot be any primary [interval of] time in which it is coming to a stop. **239ª1**

Nor, then, can there be a primary time in which what is at rest has come to be at rest. For it cannot have come to be at rest in what is without parts, because there cannot be movement in what is indivisible, and what there is being at rest in there can also be being in movement in (for something is at rest, we said,[282] if it can be naturally in movement but is not in movement when—that is, in that time in which—it is natural). Further, we also say that a thing is at rest when it is in the same state now as previously, as judged not by one point but by at least two.[283] So what a thing is at rest in cannot be without parts. But if it is divisible into parts, it would be an interval of time, and the thing will be at rest in any part of it whatever. For this can be proved in the same way as in the previous cases.

So there will be no primary interval of time. And the cause of this is that everything is at rest and in movement in time, and there is no time, magnitude, or, in general, continuous thing that is primary; for all of them are divisible without limit into parts.

And since everything that is in movement is in movement in time and changes from something to something, in that time in which it is moving intrinsically and not in some part of that time, it is impossible then for what is in movement with respect to some particular thing primarily. For to be at rest is for a thing and each of its parts to be in the same state in the same time. For this is the way we speak of a thing as being at rest: when at one now after another both it and its parts can truly be said to be in the same state. But if this is what being at rest is, it is impossible for what is changing to be doing so as a whole with respect to some particular thing in a primary time. For all the time is divisible, so that in one part of it after another it will be true to say that the thing itself and its parts are in the same state. For if it is not so in this way, but only at one now, then the thing will be the same in some certain respect not for an interval of time but in [a now that is] the limit of that time. But though in a now [what is in movement] is always the same with respect to

279. Secluding ἂν.
280. 238ᵇ23–26.
281. 238ᵇ31–36.
282. 226ᵇ12–15.
283. Since all movement and change is from something to at least one other something.

something that remains[284] unchanged, it is nonetheless not at rest; for the thing is
239b1 neither in movement nor at rest in a now. And, though it is true that, in a now, it is not in movement and is the same with respect to a particular thing, it cannot in an interval of time be so with respect to what is[285] at rest; for it then follows that what is in spatial movement is at rest.

6.9
Arguments against the Possibility of Movement

But Zeno argues fallaciously; for he says that if everything is always at rest when it is so with regard to what is equal [to itself], and what is in movement is always like that in a now, then an arrow that is in spatial movement is unmoving. But this is false. For time is not composed of indivisible nows any more than any other magnitude is composed of indivisibles.

Zeno's arguments about movement, which present difficulties to those trying to resolve them, are four in number:

The first states that there is no movement because what is in spatial movement must arrive at the halfway point before it arrives at the end. We went through it previously.[286]

The second is the so-called Achilles. It is as follows. The slowest runner will never be overtaken by the fastest; for the pursuer must first reach the point from which the former started, so that the slower must always be a bit ahead. This argument is in effect the same as that from bisection, though it differs from it in not dividing in half the additional magnitude being taken.[287] The conclusion of the argument, then, is that the slower is not overtaken, but it is reached in the same way as by bisection (for in both cases what follows is that the limit is not reached when the magnitude is divided in a certain way, although there is the additional conclusion that even the famously fastest runner[288] will fail to catch the slowest one), so that the resolution must be the same. And the claim that what is a bit ahead is never overtaken is false; for though at the time it is a bit ahead it is not overtaken, nonetheless it is overtaken if indeed it is granted that it is possible to traverse the limited distance in question.[289]

284. Reading μένον.
285. Reading τὸ.
286. 233a21–31.
287. I.e., the one covered by the slowest runner.
288. Achilles.
289. Achilles' speed is S_a, which is faster than the turtle's speed S_t; the point at which the turtle starts moving is 1. When Achilles reaches 1, Zeno proves that he is S_t/S_a behind, and that when he has traveled $1 + S_t/S_a$, he is S_t^2/S_a^2 behind, and so on. But he has not proved that when Achilles has traversed $S_a/S_a–S_b$ he is still behind, provided it is granted that this limited distance can be traversed in a limited time.

These, then, are two of the arguments. The third, stated just now, is that an arrow in spatial movement is at rest.[290] This results from assuming that time is composed of nows; for, if this is not granted, there will be no deduction.

The fourth argument concerns two rows of bodies in a stadium that are equal in size to each other in opposite directions and in front of other bodies of equal size, one lot starting from the end, the other from the middle, and both moving at equal speed, from which it follows, he thinks, that half of a time is equal to its double. The fallacy in this lies in the claim that an object in spatial movement with an equal speed takes an equal time to pass in front of a moving body as to pass in front of a body of an equal size that is at rest. But this is false. For example, let AA be the bodies of equal volume that are at rest, BB the bodies that start from the middle of the As,[291] equal in number and size to these, and CC the bodies that start from the extremity [of the As], equal in number and size to these, the speed of which is equal to that of the Bs [Fig. 4].

$A_1\ A_2\ A_3\ A_4$

$B_4\ B_3\ B_2\ B_1 \longrightarrow$

$\longleftarrow\ C_1\ C_2\ C_3\ C_4$

Fig. 4

It follows, then, that the first B is at the extremity [A_4] at the same time as the first C, when they are moving past each other. It follows that the first C has passed all the Bs,[292] while the first B has passed half [the As]. So the time is half; for each of the two takes the same time to pass each body. But, at the same time, it follows that the first B has passed all the Cs; for the first C and the first B will be at opposite extremities [of the As] at the same time, because both the first C and the first B are for an equal time in front of each A. The argument, then, is as above, but it proceeds from the falsehood mentioned.[293]

Nor with regard to change to a contradictory will there be anything impossible for us to face—for example, from the argument that if a thing is changing from not white to white but is neither one nor the other, it is therefore neither white nor not white; for if a thing is not wholly in either of the two states, it does not follow that it will not be said to be white or not white; for we say that a thing is white or not white not when the whole of it is such, but when most of its parts or its most controlling parts are: not being in a state is not the same as not being wholly in it. The same holds

290. 239^{b}5–7.
291. Reading τῶν α.
292. Retaining τὰ B.
293. 240^{a}1–4.

in the case of being and in the case of not being, and of the other pairs of contradictories; for while a thing will of necessity be in one or the other of the opposites, it is never wholly in one or wholly in the other.

And this is so again in the case of the circle and the sphere and, in general, of what is in movement within [the place occupied by] itself, and it is argued that it follows that they are at rest; for each of them and its parts will be in the same place for any interval of time, and so will be at rest and in movement at the same time. For, first, the parts are not in the same place for any interval of time, and, second, the whole is also always changing to something else; for the circumference taken from point A is not the same as the one taken from point B, C, or from each of the other points—except in the way that the human and the musical human are the same, because they coincide [Fig. 5].

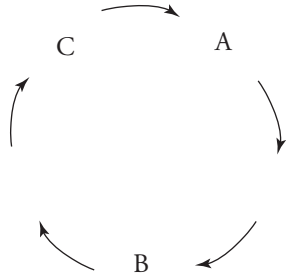


Fig. 5

So the circle is always changing from one [place to another], and will never be at rest. And it is the same way in the case of the sphere and in that of whatever else is in movement within [the place occupied by] itself.

6.10
The Movement of What Is without Parts; No Change Is Unlimited

Having demonstrated these things, we are now in a position to state that what is without parts cannot be in movement except coincidentally—for example, by the movement of the body or magnitude in which it is present, just as what is in a boat may be in movement due to the spatial movement of the boat, or as a part will be in movement due to that of the whole. (By "without parts" I mean what is indivisible with respect to quantity.) For even the movements of the parts that are intrinsic to the parts are distinct from the movements of the parts with respect to the whole. The distinction may be seen most clearly in the case of a [revolving] sphere; for the speeds

of parts near the center, of those near the surface, and of the whole sphere are not the same, implying that their movements are not one.

As we have said, then, what is without parts can be in movement in the way that a man sitting in a boat is in movement when the boat is traveling, but it cannot be so intrinsically. For let it be changing from AB to BC, whether from a magnitude to a magnitude, from a form to a form, or with respect to a contradiction. And let D be the primary time in which it is changing. Then in the time in which it is changing it must be in AB or BC or partly in one and partly in the other; for this, as we saw,[294] is true of everything that is changing. It will not, though, be partly in each of the two; for then it would be divisible into parts. But then neither will it be in BC; for then it will have changed, while it is assumed to be changing. It remains, then, that it is in AB in the time D in which it is changing. Therefore, it will be at rest; for, as we saw,[295] to be in the same state for an interval of time is to be at rest.

So it is not possible for what is without parts to be in movement or, in general, changing; for there is only one way in which such movement would be possible for it, if time was composed of nows; for then in every now it would have moved and changed, so that it would at no time be moving, but at every time have moved. But that this is impossible was already proved previously;[296] for time is not composed of nows, nor a line of points, nor a movement of instantaneous movements; for someone who states this, that it is possible for what is without parts to be in movement, does nothing other than make movement out of things without parts, just as he makes time out of nows, and length out of points.

Further, it is also evident from the following that neither a point nor any other indivisible thing can be in movement. For whatever is in movement cannot traverse a line greater than itself without previously traversing one that is equal to or less than itself. If, then, this is so, it is evident that a point too must first traverse a line equal to or less than itself. But since a point is indivisible, it cannot previously traverse one less than itself. It must, therefore, traverse one equal to itself. So the line will be composed of points; for since at every time the point traverses something equal to itself, it will measure out the whole line. But if this is impossible, it is also impossible for what is indivisible to be in movement.

Further, if everything is in movement in time, but nothing is in movement in a now, and if all time is divisible, then for everything in movement there would be a time less than that in which it traverses a part as great as itself. (For there will be such a time for what is in movement, because everything in movement is so in time, and it was proved previously that all time is divisible.[297]) If, therefore, a point is in

294. 234^{b}10–17.
295. 239^{a}26–29.
296. 237^{a}17–^{b}22.
297. 232^{b}23–233^{a}10.

movement, there must be a certain time less than that in which the point itself[298] has moved. But this is impossible; for in less time it must traverse less. So what is indivisible will be divisible into something less than itself, just as the time is into intervals of time. For there is only one way in which what has no parts and is indivisible would be in movement, if it could be in movement in a now that is indivisible; for the same argument is involved in being in movement in the now as in an indivisible thing being in movement.

No change is unlimited; for every change, both between contradictories and between contraries, is from something to something. So in changes with respect to contradiction, the affirmation or the denial is the limit—for example, in coming to be it is being, in passing away it is not being. And in those between contraries it is the contraries that are the limit; for these are the extremities of the change, and so of all alteration (for alteration is always from certain contraries).

It is likewise with increase and decrease; for the limit of increase is the complete magnitude that is in accord with the nature proper to what is increasing, while the **241b1** limit of decrease is the complete departure of this magnitude.

Spatial movement, on the other hand, is not limited in this way; for it is not always between contraries. But since what is incapable of being cut (I mean, in the sense that it does not admit of being cut; for something is said to be incapable in many ways)—what is incapable of being cut in this sense does not admit of being cut here and now, and, in general, what is incapable of coming to be does not admit of coming to be here and now, and what is incapable of changing does not admit of changing here and now to what it is incapable of changing to. If, then, what is in spatial movement is changing here and now to something, it will have the capacity to have changed to it. So its movement is not unlimited, nor will it be in spatial movement over an unlimited distance; for it cannot traverse it.

It is evident, then, that no change is unlimited in this way: in not being defined by limits. But whether a change, being one and the same, can be such as to be unlimited in time must be investigated.[299] For if the change is not one, perhaps nothing prevents this—for example, if a spatial movement is followed by an alteration, this by an increase, and this again by a coming to be; for in this way there will be forever a movement in time, but not one movement, because there is not one that is composed of all these. So, if it is to be one, no movement admits of being unlimited in time except one; and this is the spatial movement in a circle.

298. Reading αὐτή.
299. 261a27–265a12.

BOOK 7[300]

7.1
The Need for a Primary Mover

Everything that is in movement must be moved by something; for if it does not have the starting-point of movement within itself, it is evident that it is moved by something else (for what causes the movement will be some other thing); but if it does have the starting-point within itself, let AB be what is in movement intrinsically and not because some part of it is in movement. First, then, to assume that AB, because it is in movement as a whole and is not moved by anything external to itself, is therefore moved by itself is the same as, if JK is moving KL and is itself in movement, one were to assume that JL is not moved by anything, because it is not evident which part is the mover and which the moved.

Next, it is not necessary for what is not moved by anything to cease being in movement because something else is at rest, but, if a thing is at rest due to something else's having ceased moving, then it is necessary for it to be in movement due to something.

I say this because[301] if this is accepted, everything that is in movement must be moved by something. For, since AB has been taken to be in movement, it must be divisible (for everything in movement is divisible). Let it be divided, then, at C. Then when CB is not in movement, AB will not be in movement; for if AB were to be in movement, it is clear that AC would be in movement when CB is at rest, so that AB will not be in movement intrinsically and primarily. But it was assumed to be in movement intrinsically and primarily. Therefore, if CB is not in movement, AB must be at rest. But it was agreed that what is at rest if something else is not in movement must be moved by something, so that it is necessary for everything that is in movement to be moved by something. For what is in movement will always be divisible, and if a part of it is not in movement, the whole too must be at rest.

But since everything that is in movement must be moved by something, if it should happen that something that is in spatial movement is moved by something else that is in movement, and the latter is moved by something else again that is in movement, and that one by something else, and so on always in the same way, it is necessary for there to be some primary mover, and the series does not go on without limit. For suppose this is not so, suppose it does go on without limit. Then, let A

300. 7.1–3 exist in two versions, α and β (hence the non-standard Bekker page numbers). α is translated here with a translation of the β text of 7.3 appended at the end of the *Physics*. Books 5, 6, and 8 form a unified discussion, parts of which are often referred to as—or as included in—"our first accounts concerned with movement." Book 7 interrupts this sequence, suggesting that it may have been incorporated at a later date.

301. Reading γὰρ.

be moved by B, B by C, C by D, and always the next one by the next one. Since, then, it is taken as a hypothesis that the mover moves by being in movement, it is necessary for the movement of the moved and the movement of the mover to occur at the same time (for the mover is moving the moved and the moved is being moved at the same time). It is evident, then, that the movement of A, of B, of C, and of each of the moved movers will occur at the same time. Let each movement be taken, then, and let the movement of A be E, the movement of B be F, and those of C and D be G and H. For if it is always the case that each is moved by another, nonetheless we may take the movement of each as being one in number; for every movement is from something to something, and is not unlimited with respect to its extremities. By a movement that is "one in number" I mean a movement that proceeds from something numerically the same to something numerically the same in numerically the same time. For it is possible for a movement to be the same in kind, in form, or in number: in kind, if it belongs to the same category—for example, substance
242b35 or quality; in form, if it proceeds from something the same in form to something the same in form—for example, from pale to dark, or from a good to a bad that are not different in form; and in number, if it proceeds from something numerically one to something numerically one in the same time—for example, from this pale to this dark, or from this place to this place, in this time; for if in another time, the movement will no longer be one in number, but in form. But these issues were spoken about previously.[302]

And let the time in which A has been moved with its own movement also be taken, and let it be J. Since the movement of A is limited, the time will also be limited.[303] Since, then, the movers and the moved are unlimited, the movement EFGH composed of all of them will be unlimited. For it is possible for the movements of A, B, and the others to be equal, or the movements of the others may be greater, so that, whether they are equal or greater, in both cases the whole movement is unlimited. For we are assuming what is possible. And since the movement of A and that of each of the others occur at the same time, the whole movement will occur at the same time as that of A. But the movement of A is in a limited time. So there would be an unlimited movement in a limited time, which is impossible.[304]

It might thus seem, then, that what we initially set out to prove has been proved, but it has not been demonstrated, because nothing impossible has been proved; for in a limited time there can be unlimited movement, although not of one thing but of many. And this is precisely what happens in the case of these things [A, B, C, D, and so on]; for each of these is being moved with its own movement, and for many things to be moving at the same time is not impossible. But if what in a primary way causes movement with respect to place and with a bodily movement

302. 5.4.
303. 6.7.
304. 238a32–b22.

must either be in contact with, or be continuous with, what is moved, as we see to be so in all cases, then the things moved and the movers must be continuous with, or in contact with, each other, so that one thing is composed of all of them. And whether this thing is limited or unlimited makes no difference to the cases before us now; for in all cases the movement will be unlimited when the things are unlimited, if indeed the movements of the things admit of being either equal to or greater than each other; for we are assuming that what is possible is real. If, then, what is composed of ABCD is a thing that is either limited or unlimited and is moved with the movement EFGH in time J, and this is limited, it follows that in a limited time either what is limited or what is unlimited goes through an unlimited movement, which in both cases is impossible. So the series must come to a stop, and there must be a first mover and a first moved. For it makes no difference that the impossibility follows from a hypothesis; for the hypothesis that was taken is something possible, and when what is possible is posited, nothing impossible should come about because of it. **243^a30**

7.2
The Primary Mover Is Always Together with What Is Moved by It

The primary mover—not as the for-the-sake-of-which, but as the starting-point from which the movement proceeds—is together with what is moved by it (by "together" I mean that nothing is intermediate between them); for this is something common to every moved and mover. And since there are three sorts of movements, with respect to place, with respect to quality, and with respect to quantity, there must also be three sorts of movers: one that causes spatial movement, one that causes alteration, and one that causes increase or decrease. First, then, we must speak about spatial movement; for it is the primary sort of movement.

Everything, then, that is in spatial movement is moved either by itself or by something else. In the case of things that are moved by themselves it is evident that the moved and the mover are together; for the primary mover is within these things themselves, so that there is nothing intermediate in between. As for those that are moved by something else, this must occur in four ways; for spatial movements caused by something else are of four forms: pulling, pushing, carrying, and rotating. For all movements with respect to place are led back to these; for pushing along is a sort of pushing in which what is moving something away from itself follows it and continues to push it, while pushing away is when it does not follow what it has moved. Throwing is when the mover produces a movement away from itself that is more violent than the spatial movement that is in accord with nature, and in which the thing would continue to be spatially moved for as long as the imparted movement is in control. Again, pushing apart and pushing together are sorts of pushing and pulling; for pushing apart is a sort of pushing away (for the pushing away is either from the

pusher itself or from something else), while pushing together is a sort of pulling (for in fact the pulling may be toward the puller itself as well as toward something else).

So too with their forms, such as packing and combing; for the former is a sort of pushing together, the latter a sort of pushing apart.[305] And the same is true of the other sorts of aggregation and disaggregation (for they will all be found to be sorts of pushing apart or pushing together), except for the ones that are involved in coming to be and passing away. (At the same time it is evident that[306] aggregation and disaggregation do not constitute another kind of movement; for they are all divided into the ones mentioned.[307]) Further, inhaling is a sort of pulling, exhaling a sort of pushing. And the same is true of spitting and of all other movements that occur through the body, whether excretive or assimilative; for the latter are pullings, the former pushings away.

But the other sorts of movement with respect to place must also be led back [to the four forms]; for they all fall into these four. And again, of these four, carrying and rotating may be led back to pulling and pushing. For carrying is in accord with one of the other three modes (for what is carried is in movement coincidentally, because it is in or on something that is in movement, and what carries it carries it by being pulled, pushed, **244a1** or rotated, so that carrying is common to all three). And rotating is a compound of pulling and pushing; for what is rotating a thing is pulling one part of it and pushing another; for it leads one part away from itself and another part toward itself. So, if what is pushing and what is pulling are together with what is being pushed and what is being pulled, it will be evident that in movement with respect to place there is nothing intermediate between moved and mover.

But then that this is so is clear even from the definitions; for pushing is a movement away from the pusher itself, or from something else, to something else, while pulling is movement from something else to the puller itself, or to something else, when the movement of what is pulling[308] is faster than the one that would separate the continuous things from each other; for it is this way that one is pulled along with the other. (But perhaps it might seem that there is also another way of pulling; for it is not in this way that wood pulls fire.[309] But it makes no difference whether what pulls is in movement or remains at rest when it is pulling; for in the latter case it pulls to where it is, in the former to where it was.) It is impossible for a mover to move anything either from itself to something else or from something else to the mover itself without making contact with it. So it is evident that in movement with respect **244b1** to place there is nothing intermediate between the mover and the moved.

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305. I.e., pushing together the weft thread in weaving and pushing apart the warp threads to allow the shuttle containing the weft threads to pass between them.

306. Reading ἡ.

307. 243a16–17.

308. Retaining τοῦ ἕλκοντος.

309. The natural movement of fire is upward; burning wood, though stationary, seems to pull the fire toward itself.

But then neither is there anything between what is altered and what alters it. This is clear from induction; for in every case we find that the last thing that alters something is together with the first one that is altered {for our assumption is that what is being altered is altered by being affected with respect to its so-called affective qualities.}[310] For every body differs from another body in possessing a greater or lesser number of perceptible characteristics or the same ones to a greater or lesser degree. But then the alteration of what is altered is also due to the perceptible characteristics that were mentioned. For they are affections of the relevant underlying quality; for we say that a thing is altered by becoming hot, sweet, dense, dry, or pale, saying this alike of the inanimate as well as of the animate, and again, in the case of animate things, alike of the parts that are not capable of perception and of the perceptual modalities themselves. For the perceptual modalities themselves are also altered in a way; for active perception is a movement through the body, when the perceptual modality is affected in a certain way. Whatever way the inanimate can be altered, then, the animate can also be altered, while not every way that the animate can be altered is a way the inanimate can (for it cannot be altered with respect to the perceptual modalities). Also the inanimate is not aware of being affected, while the animate is aware. But nothing prevents the animate too from being unaware when the alteration is not with regard to the perceptual modalities. If indeed, then, the alteration of what is altered is due to perceptible things, in every case of this sort of alteration, at any rate, it is evident that the last thing that alters something and the first thing that is altered are together; for the air is continuous with what causes the alteration, and the body that is altered is continuous with the air. Again, the color is continuous with the light, and the light with the sight. And it is the same way with hearing and smelling; for the first mover relative to what is moved is the air. It is the same way in the case of tasting; for the flavor is together with the capacity of taste. And it is likewise with things that are inanimate and incapable of perception. So there can be nothing intermediate between what is altered and what alters it.

Nor, again, can there be anything intermediate between what is increased and what increases it; for the primary thing that causes the increase does so by becoming attached to what is increased in such a way that the whole becomes one. And again, what decreases something decreases it when some part becomes detached from what is decreased. It is necessary, then, for what increases something or what decreases something to be continuous with what is increased or decreased, and between continuous things there is nothing intermediate.

It is evident, then, between the moved and the mover that is primary, or last in relation to the moved, there is nothing intermediate.

5 5a 5b 5c 5d 10 15 **245^{a}1** 5 10 15 **245^{b}1**

310. Inserted to fill a lacuna in the text and explain the reference to the "characteristics that were mentioned" some lines below.

7.3
Everything That Is Altered Is Altered Due to Perceptibles

That everything that is altered is altered due to perceptibles, and that there is alteration only of those things that are said to be intrinsically affected by these, is a fact that may be theoretically grasped from the following considerations. For of the others it would be most natural to suppose that there is alteration in figures and shapes, and in states, that is, in acquiring or losing them. But in neither of these two is there alteration.

For when the thing that is being configured or arranged has been completed, we do not say that it is what it is composed of—for example, we do not say that the statue is bronze, or the candle wax, or the bed wood, but using a paronym, that they are brazen, waxen, or wooden. But when a thing has been affected or altered, we still refer to it by what it is composed of; for we say that the bronze or the wax is hot or hard, and not only in this way, but we also say that the wet or the hot is bronze, referring homonymously to the matter by using [the name of] the affection. So then, **246a1** if as regards figure and shape what comes to be and has the shape in it is not said to be what it is composed of, but as regards affections and alterations it is said to be this, it is evident that the comings to be cannot be alterations.

Further, it would seem to be absurd even to speak in this way, of a human being or a house or anything whatever that has come to be as having been altered. But though each such coming to be must, perhaps, involve something's being altered, for example, the matter's being condensed or rarified or heated or cooled, nonetheless it is not the things that are coming to be, at any rate, that are altered, and their coming to be is not an alteration either.

But then the states, whether of the body or of the soul, are not alterations either. For some states are virtues and others vices, and neither virtue nor vice is an alteration. Instead, virtue is a sort of completion (for when each thing acquires its own virtue, at that point it is said to be complete—for then it is most of all in accord with its[311] nature, just as a circle is complete when it has most of all become a circle and when it is best), while vice is the passing away and departure of this completion. Just as, then, we do not speak of the completion of a house as an alteration (for it is absurd if the coping-stone or roof-tile is an alteration, or if in receiving its coping-stone or roof-tile the house is being altered but not completed), it is the same way in the case of virtues **246b1** and vices and of what possesses or acquires them; for virtues are completions and vices departures, so that they are not alterations.

Further, we say that all virtues are in [the category of] being related in a way to something. For those of the body, such as health and good condition, lie in a blending and proportion of hot and cold things, either of one in relation to another within the body or in relation to what encompasses it; and likewise in the case of beauty,

311. Retaining τὸ.

strength, and all the other virtues and vices. For each is in[312] [the category of] being related in a way to something and puts its possessor in a good or bad condition with regard to its proper affections—the proper ones being those due to which it naturally comes to be or passes away. Since, then, relatives are neither themselves alterations nor is there alteration, coming to be, or, in general, any change whatever of them, it is evident that neither states nor the losing or acquiring of them are alterations. But perhaps when these come to be or pass away some other things must be altered, as in the case of both the form and the shape—for example, hot, cold, dry, and wet things, or whatever it may be that these states first reside in. For each virtue or vice is said to be concerned with those things by which its possessor is naturally altered; for a virtue makes its possessor be either unaffectable or capable of being affected in such-and-such a way, while vice makes it be capable of being affected or unaffectable in the contrary way.

It is likewise too in the case of states of the soul; for all these also belong in [the category of] being related in a way to something, the virtues being completions, the vices departures. Further, virtue puts its possessor in a good condition with regard to its proper affections, while vice puts it in a bad one. So these will not be alterations either, and neither, then, will the losing or acquiring of them be. But for them to come to be, the perceptual part [of the soul] is necessarily altered. And it is altered by perceptibles; for every virtue of character is concerned with bodily pleasures and pains, and these lie in doing actions, in remembering, or in expectation. Those that lie in action are in accord with perception, so that it is due to something perceptible that they are moved, while those that lie in memory or in expectation are due to this; for people are pleased either by remembering what has affected them or by expecting what is going to affect them. So every such pleasure must come to be due to perceptibles. And since when pleasure and pain come to be, virtue and vice come to be as well (for they are concerned with these), and pleasures and pains are alterations of the perceptual part, it is evident that to lose or acquire these states, something must also be altered. So, though their coming to be involves alteration, they themselves are not alterations.

But then the states of the understanding part are not alterations either, nor is there any coming to be of them. For very much more [than in the case of the virtues of character] we speak of what has scientific knowledge as belonging in [the category of] being related in a way to something. Further, it is also evident that there is no coming to be of these; for what has scientific knowledge potentially comes to have scientific knowledge [actively] not at all by being itself moved but by the presence of something else. For when the particular comes to be present, the universal is in a way scientifically known by means of the particular.[313] Again, there is no coming to be of the use and activity of the state, unless one thinks that there is also a coming to be of

312. Reading ἐν.
313. *Met.* 1087ᵃ15–21.

seeing and touching; for its using and being in activity are similar to these. And the initial acquisition of scientific knowledge is not a coming to be or an alteration; for we are said to scientifically know and to be practically wise as a result of our thought's having come to rest and to a stop,[314] and there is no coming to be of being at rest, or indeed of any change at all, as was also stated previously.[315]

Further, just as when someone changes from drunkenness, sleep, or disease to the contrary states we do not say that he has come to have scientific knowledge again, and yet he was incapable of using his knowledge [while drunk, asleep, or diseased], so likewise when he initially acquires the state we must not say either [that he is coming to have scientific knowledge]; for it is due to the soul's settling down from its natural restlessness that something comes to possess wisdom or scientific knowledge. That is also why children, unlike their elders, are incapable of either learning or discerning by means of the perceptual modalities; for the disturbance and movement [in their souls] is great, and it settles down and comes to rest with regard to some things due to nature itself, and with regard to others due to other causes, but in both cases accompanied by the alteration of certain things in the body, just as in the case of the use and activity [of the understanding part] when someone becomes sober or wakes up.

It is evident, then, from what has been said, that being altered and alteration occur in perceptible qualities and in the perceptible part of the soul, and in nothing else except coincidentally.

7.4
A Puzzle Concerning the Commensurability of Movements

One might raise a puzzle as to whether every movement is commensurable with every other or not. If, then, they are all commensurable, and sameness of speed is equal movement in equal time, then a circumferential movement may be equal to a movement in a straight line, or, then, greater or less than it. Further, an alteration may be equal to a spatial movement, when in an equal time one thing has altered while another has spatially moved. An affection, therefore, may be equal to a length. But this is impossible. Or is it rather, therefore, that when in an equal time they move equally, at that time there is equal speed, but an affection is not equal to a length, so that an alteration is not equal to or less than a spatial movement, so that not all movements are commensurable?

In the case of the circle and the straight line, though, how will it be? For it is absurd if the movement of one thing in a circle is not similar to that of another in a straight line, but instead is immediately faster or slower, just as if one is downhill and the other uphill. Nor does it make any difference to the argument if one says that

314. *DA* 407a32–33, *Met.* 994b24, 1067b8–11.
315. 225b15–16.

the movement must be immediately faster or slower; for then the circumference will be greater or less than the straight line, so that they can be equal too. For if in time A [the faster X] has traversed B, and the other [the slower Y] has traversed C, then B would be greater than C; for this is what "faster" was said to mean.[316] Then too if in less time a thing traverses an equal distance, it is faster. So there will be a part of time A in which [X] traverses a part of the circle equal to [the straight line] C, while [Y] traverses C[317] in the whole time A. But then if these are commensurable, what has just been said follows, a straight line will be equal to a circle. But these are not commensurable, nor, therefore, are the movements.

But [it might be responded] it is the things that are not synonymous that are all incommensurable. For example, why is it that a pencil, a wine, and the highest note in a scale are incommensurable with respect to sharpness? Because homonymous things are not commensurable. The highest note is commensurable with the next note, because "sharp" as applied to both signifies the same thing. Is it, therefore, that fast as applied to both [X and Y] does not signify the same thing, and does so far less in the case of an alteration and a spatial movement?

Or, in the first place, is this not true: that if things are not homonymous, they are commensurable? For "much" signifies the same in the case of water as in that of air, and these are not commensurable [in this respect]. Or if not this, "double," at any rate, signifies the same (for it signifies the ratio of two to one), and these are not commensurable in this respect either. Or even in the case of these does the same argument apply? For even "much" is homonymous. Yet of some terms even the accounts are homonymous—for example, if someone were to say that "much" means such-and-such an amount plus more and that such and such an amount signifies distinct things in distinct cases. Also, "equal" is homonymous, and, if that was so, "one" would also be immediately homonymous. And if this was so, "two" would be homonymous as well, since why would some of these be commensurable and others not, if indeed they had a single nature?

Or is it because the primary recipient is distinct? A horse, then, and a dog are commensurable as to which is whiter (for what the whiteness is primarily in is the same, the surface), and similarly with respect to magnitude. But water and sound are not commensurable [with respect to whiteness and magnitude]; for what it is [primarily] in is distinct. Or is it clear that in this way all the cases will be made into one, by saying that each exists in a distinct [primary recipient], that is, the equal will be the same in each case, as will the sweet and the white, but distinct in a distinct recipient? Further, it is not any random thing that is receptive of a random affection, instead one thing is primarily receptive of one affection.

But must it therefore be the case that commensurable things are not only not homonymous but that no differences belong either to themselves or to what they are

316. 232ᵃ25–26.
317. Reading τὴν Γ.

in? I mean, for example, in the way that color exhibits differences; for this is surely why things are not comparable with respect to it (for example, as to which of the two is more colored, not with respect to a particular color, but insofar as it is a color), but are comparable with respect to whiteness.

Similarly, as regards movement, things have the same speed which[318] in an equal time move such-and-such an equal amount. If, then, in this [time] one [half] of a thing's length is altered while the other half is spatially moved, is the alteration equal to—that is, does it have the same speed as—the spatial movement? But that would be absurd. And the cause of this is that movement has forms. So [must we correct our statement and say that] if things in equal time spatially move an equal length, they are of equal speed? But then a straight line and a circumference will be equal. What, then, will the cause of this be? Is it that spatial movement is a kind or that line is a kind (for the time is the same in form)? Or rather are the two [the movement and the line] together divided in form?[319] For spatial movement has [different] forms if that over which the movement occurs has [different] forms. (And sometimes it has different ones if that by which it occurs has different ones—if by feet, it is walking, if by wings, flying. Or is that not so, but is it rather by its shapes[320] that spatial movement is distinguished?) So [must we correct our statement again and say that] things are of equal speed if in an equal time they traverse the same magnitude—where being the same consists in being undifferentiated in form and [thus] in the movement [over it] being undifferentiated?

So we must investigate what the differences in movement are. And the foregoing argument indicates that the kind is not something that is one, but that beyond this case there are many others that are overlooked, and that among cases of homonymy some are far removed from each other, some have some similarity to each other, and some are close either in kind or by analogy, which is why they do not seem to be cases of homonymy, though they are. When, then, is the form distinct? Is it when the same thing is in distinct subjects, or when distinct ones are in distinct ones? And what will the defining mark be? Or by what are we to discern that the white and the sweet are the same or distinct? Is it because they appear distinct in distinct subjects, or is it because there is no sameness at all?

Concerning alteration, then, how will one alteration have a speed equal to that of another? If to become healthy is to be altered, one person may be cured quickly, another slowly, and some at the same time, so that in the latter case alterations will be of equal
249b1 speed; for each was altered in an equal time. But what altered? For we cannot speak of equal here, but rather what in [the category of] quantity is equality, is here similarity. However, let things be of equal speed if in an equal time their change is the same. Is it, then, what the affection is in or the affection itself that must be commensurable? Here in our example, indeed, it is because health is the same that we may ascertain that

318. Reading τὸ.

319. Reading χρόνος ὁ αὐτὸς τῷ εἴδει ἢ ἅμα κἀκεῖνα.

320. I.e., by the different shapes of the path, whether straight, circular, or otherwise, over which it occurs.

one alteration is neither more nor less than the other but that both are similar. But if the affections are distinct, as when a thing alters by becoming pale and by becoming healthy, in these cases there is no sameness, equality, or similarity, insofar as these affections at once make the alterations differ in form, and so there is not just one form, any more than there is in the case of spatial movements. So we must ascertain how many forms there are of alterations and how many of spatial movements.

If, then, the things that are in movement—that is, the ones to which the movements belong intrinsically and not coincidentally—differ in form, then their movements will also differ in form. On the other hand, if the things differ in kind, their movements will differ in kind, and if in number, in number. But then, should we look to the affection, as to whether it is the same or similar, to find out if the alterations are of equal speed, or to the things that are being altered, as to whether, for example, so-and-so much of one has become pale and so-and-so much of the other? Or should we look to both, and regard the alterations as the same or not the same according as the affections are the same or not the same, and equal or unequal according as the things altered are equal or unequal?

And in the case of coming to be and passing away the investigation is the same: how is one coming to be equal in speed to another? They are of equal speed if in equal time two things come to be that are the same, that is, indivisible [in form]—for example, two human beings but not two animals. And one is faster than the other if in an equal time the things that come to be are distinct (for here we do not have two things between which distinctness is like dissimilarity), or, if substance is number, then within the same form one number may be greater than another. But there is no name common to these, nor is there a name for each of them, as "more" applies to a higher or superior degree of an affection and "greater" to that of a quantity.

7.5
Proportionality of Movements

A mover always moves something, in something, and as far as something (I mean by "in something" time, and by "as far as something" that the distance traversed is a certain quantity); for always when a thing is causing movement it at the same time has caused movement, so that there will be a certain quantity [of distance] that has been traversed and a certain quantity [of time] in which it has been traversed. If, then, A is the mover, B the moved, C the distance traversed, and D the time in which it is traversed, then in the same time a capacity equal to that of A will move half of B **250^{a}1** twice C, and it will move half of B the whole of C in half of D; for in this way there will be proportionality. And if the same capacity moves the same thing such-and-such a distance in a given time, and half of the distance in half of the time, then half its strength will move half the thing an equal distance in an equal time. For example, let E equal half the capacity of A and F equal half of B. Then the strength is similarly and

proportionally related to the weight in each case, so that there will be a movement of an equal distance in an equal time.

Also, if E moves F distance C in time D, it does not necessarily follow that in the same time E can move twice F half of C. If, then, A moves B distance C in time D, it is not necessary that in the time D, or in some part of it, the half of A, which is E, will move B a part of C whose ratio to the whole of C is proportional to that between A and E. For, in general, it may happen that E will not move B at all; for if the whole strength moved it so-and-so much, it does not follow that half that strength will move it any quantity in any time whatever; for otherwise one man might move a ship, if indeed the strength of the ship-haulers and the distance they all move it are divisible by their number.

This is why Zeno's argument is not true when he says that any part whatever of the millet makes a sound. For there is nothing to prevent any part from failing, in any time whatever, to move the air that the whole medimnus[321] moves when it falls. In fact, it does not even move such a part of the whole as it would move if it were by itself. For none exists except potentially in the whole.

On the other hand, if there are two movers and each of the two moves a distinct thing so-and-so much in such-and-such time, then the capacities in composition will also move the weights in composition an equal distance in an equal time; for there is proportionality.

Is it also this way, then, in the case of alteration and in the case of increase? For there is something that causes the increase, something that is increased, in so much time, and a quantity that the one causes the other to increase by and that the other increases by. Similarly, there is what alters something and what is altered, a certain quantity of alteration with respect to the more and the less, and in a quantity of time. And in twice as much time there is twice as much alteration, and twice as much in twice as much. And half in half the time, or in half the time half, or in equal time twice it.

On the other hand, if what alters something or causes it to increase does so-and-so much of it in such-and-such time, it does not necessarily follow that the half will be done in half the time, or that in half the time the half will be done. Instead, it may happen that it does not alter anything or increase anything at all, as in the case of weight.

BOOK 8

8.1
The Eternality of Movement

Did movement come to be at some time, though it did not exist before, and does it pass away again in such a way that nothing is in movement? Or is it that it neither

321. A measure of weight. Approximately 60 lbs.

came to be nor passes away, but always existed and always will exist and, being deathless and unceasing, is present in beings like a sort of life for all things composed by nature?

That there is such a thing as movement is asserted by all those who say anything about nature, because they describe the production of the cosmos, and their entire theoretical investigation is concerned with coming to be and passing away, which could not exist if movement did not exist. But those who say that there are unlimited cosmoses,[322] some coming to be and some passing away, are saying that there is always movement (for these comings to be and passings away necessarily involve movement), while those who say that there is one cosmos, or one[323] that did not always exist, also make assumptions about movement that are in accord with their account.

If, then, it is possible that at some time nothing is in movement, this must come about in one of two ways; for either it will be as Anaxagoras says (for he says that all things were together and at rest for an unlimited time, and then the [divine] understanding produced movement in them and disaggregated them) or as Empedocles does, with things being in turn in movement and again at rest—in movement when love makes one from many or strife makes many from one, and at rest in the intermediate times, as he says:

> Thus insofar as they have learned to grow into one from more than one,
> And in turn, with the one growing apart, to become more than one,
> They come to be and do not have a steadfast life: **251^{a}1**
> But insofar as they alternate continually without cease,
> They are always immovable in a circle.[324]

For by "but insofar as they alternate" we must take him to mean from this to that. We must investigate, then, how things stand as regards these issues; for to see the truth will advance the work not only of the theoretical investigation concerned with nature, but also of the methodical inquiry concerned with the primary starting-point.[325]

Let us start first from what we previously determined in the *Physics*.[326] We say,[327] then, that movement is the activation of the movable, insofar as it is movable. For each sort of movement, therefore, there must exist things that are capable of moving. In fact, even apart from the definition of movement, everyone would agree that for each sort of movement it must be what is capable of the movement that is in movement—for example, it is what is alterable that is altered and what is changeable

322. E.g., Leucippus, Democritus, and, though less certainly, Anaximander.
323. Rejecting the addition of ἢ ἀεὶ.
324. B17.9–13 DK.
325. I.e., that conducted in the *Metaphysics*.
326. Aristotle sometimes contrasts Book 8 with the *Physics*, as he here contrasts it with 3.1, and with other books at 253^{b}8 (Book 2), 257^{b}1 (Book 6), 267^{b}21–22 (Book 3 again). But these terms have no fixed reference for him. Thus *Met*. 1073^{a}32 uses "the *Physics*" to refer to 8.8–9.
327. 201^{a}10–11.

with respect to place that is in spatial movement. So there must be a burnable before there is a being burnt, and a capable of burning something before there is an act of burning. These things too, then, must come to be at some time, having not existed previously, or they must always exist.

Therefore, if each of the movable things came to be, then, before the movement in question, there must have been another change and movement in which the thing capable of being moved or of moving something came to be. But if such things always preexisted without there being any movement, it is manifestly absurd when we first stop to think about it, and must become still more so as we go on doing so. For if some things are movable while others are capable of moving things, then if there is a time when there is a first mover and a first moved, and another time when there is no such thing, but rather things are at rest, these ones must have changed previously; for there was some cause of their being at rest; for rest is a privation of movement. So prior to the first change there will be a previous change.

For some things move things in only one way, while others do so with contrary movements—for example, fire heats but does not cool, while the science of contraries seems to be one science. There appears to be something similar occurring even in the former case (for cold heats in a way by turning aside or retiring, just as the person with scientific knowledge errs voluntarily when he uses his scientific knowledge in the reverse way), but things, at any rate, that are capable of affecting or being affected, or of moving something or being moved, are not capable of it under all conditions, but only if they are in a certain condition and are near each other. So when one thing has approached another, it moves it, and the other is moved, that is, when one was such that it was capable of moving the other and the other of being moved. If, therefore, the movement was not always going on, it is clear that they were not in a condition such that the one was capable of being moved and the other capable of moving it, but rather one of them had to change; for in things that are related it is necessary for this to happen—for example, if one thing was not double another but is double it now, one of the two, if not both, must have changed. Therefore, there will be a change previous to the first change.

{In addition to these considerations, how will there be a before and after if time does not exist? Or how will there be time if movement does not exist? If time is really a number of movement or a sort of movement, if indeed there is always time, movement too must be eternal. But then in the case of time, at least, all—with a single exception—are manifestly of one mind; for they say that it does not come to be. In fact it is because of this that Democritus in particular proves how it is impossible for everything to have come to be; for time does not come to be. Plato alone makes it come to be; for he says[328] it exists together with the heaven, and that the heaven came to be. If, then, it is impossible for time to exist or to be understood without the now, and if the now is a sort of intermediate, and involves a starting-point and an

328. *Timaeus* 38b.

end-point at the same time, a starting-point of the future time and an end-point of the past time, it follows that time must always exist. For the extremity of the time taken as last will lie in a certain one of the nows (for there is nothing to take in the time besides the now), so that since the now is both a starting-point and an end-point, there must always be time on both sides of it. But if time does exist, it is evident that movement must exist as well, if indeed time is a sort of affection of movement.}[329]

The same argument also applies to movement's not being capable of passing away; for just as the coming to be of movement implied the existence of a change previous to the first, in the same way here it implies the existence of one later than the last; for a thing does not cease being in movement and being movable at the same time, for example, being burned and being burnable (for it is possible for something to be burnable without being burned), and neither do being capable of moving something and moving it. And what is capable of causing something to pass away will have to pass away after it has caused it to pass away, and what is capable of causing this to pass away will in turn have to pass away later; for passing away is also a sort of change. If, then, these things are impossible, it is clear that there is eternal movement, not something that existed at one time, but not at another. In fact, to say such things seems more a matter of fabricating stories.

And the same is true for saying that things are naturally this way and that one must acknowledge it as a starting-point, which is precisely what Empedocles would seem to be saying, that for love and strife alternately to rule and cause movement holds of things by necessity, and for there to be rest in the intermediate time. And maybe those who posit a single starting-point of movement, such as Anaxagoras, would also speak in this way. But surely there is nothing, at any rate, disorderly in things that happen by nature or in accord with nature; for nature is a cause of order in everything. Between one unlimited thing and another unlimited thing, however, there is no ratio, while all order is ratio. But for things to be at rest for an unlimited time, then in movement at some time, and no difference at all to cause this happening now rather than earlier, and with no order of any sort involved either, is no longer a work of nature. For what holds by nature is either simple, and not sometimes one way and sometimes another (for example, fire spatially moves upward by nature, and not sometimes up and sometimes not) or, if not simple, it involves some ratio.

That is why it is better to say with Empedocles, or anyone else who may have spoken as he does, that the universe is alternately at rest and in movement again; for such a state of affairs already involves some sort of order. But even someone who says this must not only state it but also say what the cause of it is—and he must neither merely posit something or assume an un-argued axiom, but must produce either an induction or a demonstration; for the things assumed [by Empedocles] are not

329. Since this section interrupts the main argument of the chapter, it may be either a digression or a later insertion.

themselves causes of this alternation, nor was it the being for love or for strife to cause it, but for the one to aggregate and for the other to disaggregate. And if he is going to go on to determine the details of their alternation, he must say under what conditions it happens, just as he says that there is something—love—that causes human beings to aggregate, and that enemies flee each other; for he assumes that this also holds in the whole cosmos, because it is apparently so in some cases. And that love and strife rule for equal periods of time also requires some argument.

In general, to think that this is an adequate starting-point, that something always is or comes to be in this way, is an incorrect assumption to make. Thus Democritus refers back causes concerned with nature to the fact that this is how things also happened previously. Of what always happens, however, he does not think it fitting to seek a starting-point, which in some cases is a correct thing to say, but that it holds in all cases is not correct. For in fact a triangle has its angles always equal to two right angles as well, but nonetheless there is some other cause of the eternality of this, although of starting-points that are eternal there is no other cause.

As regards the view, then, that there never was a time when movement did not exist, nor will be one when it will not exist, let this much be said.

8.2
Puzzles about the Eternality of Movement

The claims that go contrary to these are not difficult to refute. For it is when people investigate on the basis of considerations like the following that it might most of all seem to be possible for movement to exist though at one time it had not existed at all:

First, no change is eternal; for every change is naturally from something to something, so that every change has as its limits the contraries between which it takes place, and no movement goes on without limit.

Further, we see that it is possible for something to be moved that is neither in movement nor has any movement whatever within itself—for example, in the case of inanimate things that are not in movement, either in any part whatever or as a whole, but are at rest, we see them being moved at some time. But they must be either always in movement or never, if indeed movement does not come to be when it has not existed previously.

This is by far most evident in the case of animate things; for sometimes, though there is no movement whatever in us and we keep still, nonetheless at some moment we are in movement, and a starting-point of movement comes to exist in us from ourselves, even if nothing external moves us. We do not see anything like this in the case of inanimate things, but are always moved by some other external thing. But the animal, we say moves itself. So, if indeed an animal is sometimes altogether at rest, movement might come to exist in an unmoving thing from itself and not from outside. But if this can happen in an animal, what prevents the same thing from

happening throughout the universe? For if it happens in the microcosm, it can also happen in the macrocosm. And if in the cosmos, then also in the unlimited, if indeed it is possible for the unlimited to be in movement or at rest as a whole.

Among these considerations, then, the first mentioned—that movement to opposites is not always the same and one in number—is correct. For this is perhaps necessary, if indeed it is possible for the movement of what is one and the same to be not always one and the same. I mean, for example, there is a question as to whether the note from a single string is also one and the same, or a distinct one each time, although the string is in the same condition and moves in the same way. But whatever the case may be, nothing prevents some movement from being the same and eternal by being continuous. This will become clearer from what we say later.[330]

253^{a}1 As for what was not in movement being moved, it involves nothing absurd if an external mover of it is sometimes present, sometimes not. We must, however, inquire about how this can happen, I mean, that the same thing is at one time moved by the same mover capable of moving it and sometimes not; for the one who says this does nothing other than raise the puzzle as to why it is that some things are not always at rest and others always in movement.

The third consideration might seem to involve the greatest puzzle, as to how movement can come to be in things it was not present in before, which is what happens in the case of animate things; for one previously at rest walks later, although nothing external moved it, as it seems. But this is false. For we always see that some innate part in the animal is in movement. And of the movement of it the animal itself is not the cause, but perhaps what encompasses it is. It itself, we say, moves itself not in the case of every sort of movement, but in the one with respect to place. Nothing prevents, then, many movements from coming to be in the body due to what encompasses it (or rather it is presumably necessary for this to be so), and of these some move thought or desire, and that in turn moves the whole animal. This happens, for example, in cases of sleep. For although no internal perceptual movement takes place at all, yet some sort of internal movement does, and the animal wakes up again. But in fact about these issues too things will be evident from what follows.[331]

8.3
Immobility and Movement

The starting-point of our investigation will also be[332] precisely the one having to do with the puzzle that has just been mentioned: why some beings are sometimes in movement and in turn sometimes at rest. But necessarily either all things are always at rest, or all things are always in movement, or some things are in movement and

330. 8.8.
331. 259^{b}1–16.
332. Reading ἔσται ἥπερ.

some at rest, and in this last case again either the things in movement are always in movement and the things at rest always at rest, or all things are alike naturally in movement or at rest, or the remaining and third alternative. For it is possible for some beings to be always unmoved, others always in movement, while some have a share in both conditions. And this is precisely the one that we must assert; for this holds the resolution of all the puzzles we raised, and is the end for us of this present study.

To say that all things are at rest and to seek an account of it, disregarding perception, is a sort of lack of eagerness in thinking, a disputing of the whole rather than some part of it, and is directed not only against the natural scientist, but against (one might almost say) all the sciences and all beliefs, because all of these make use of movement. Further, just as in accounts concerned with mathematics objections to starting-points are not directed against the mathematician, and likewise in all the other cases, so the position stated just now is not directed against the natural scientist; for it is a hypothesis for him that nature is a starting-point of movement.

To say that all things are in movement is also pretty much false, though less contrary to our methodical inquiry;[333] for in the *Physics* nature was posited as a starting-point of rest as well as of movement, and likewise[334] movement as something caused by nature. In fact, some thinkers maintain not that some of the beings are in movement and some not, but that all of them always are, though our perception fails to notice this. Although they do not define what sort of movement they mean, or whether they mean all sorts, it is not difficult to reply to them. For increase and decrease cannot go on continuously, but there is also what is intermediate. The argument is like the one that deals with dripping water wearing away stones and plants splitting them by growing up through them; for if so-and-so much was driven out or taken away by the dripping water, it does not follow that half that much was previously driven out or taken away in half the time. But just as in the case of hauling a ship, so-and-so many drops move so-and-so much, but a part of them does not move that much in any period of time. What is taken away, it is true, is divisible into many parts, but none of those was moved separately, but all were moved together. It is evident, then, that from the fact that decrease is divisible without limit it does not necessarily follow that some part is always being taken away, but rather that the whole is at some time taken away.

It is likewise in the case of any sort of alteration whatever; for if what is altered is divisible without limit into parts, it does not follow because of this that the alteration itself is as well; on the contrary, it often happens all at once, as in the case of solidification. Further, whenever someone has fallen ill, there must be a time during which he will become healthy [if he does]—he cannot change [instantly] at the end of time. And the change must be to health and to nothing else. So to say that alteration is continuous is to dispute what is far too evident to dispute. For alteration is to what is contrary, while the stone becomes neither harder nor softer. And as regards spatial

333. Than to say that all are at rest.
334. Reading ὁμοίως.

movement, it would be a wonder if it escaped our notice whether it was in spatial movement downward or resting on the earth. Further, earth and each of the other elements necessarily remain in their proper places and are removed from them [only] by force. If indeed, then, some of them are in their proper places, it is necessary that not all things be in movement with respect to place. **254^{a}1**

From these and other such arguments one may be persuaded, then, that it is impossible either for all things to be always in movement or for all to be always at rest.

But then it is not possible either for some things to be always at rest and some things to be always in movement, but for nothing to be at rest at one time and in movement at another time. And we must say that it is impossible in these cases too on just the grounds that it was in the previous cases we described (for we see the sorts of changes we mentioned occurring in the same things), and, in addition, that the person who disputes this is in conflict with the evident facts; for there can be no such thing as increase, nor will movement by force occur, if nothing that is previously at rest will be moved contrary to nature. This account, then, does away with coming to be and passing away. But movement seems to pretty much everyone to be a sort of coming to be and passing away; for what something changes to, it comes to be this, or in this, and what it changes from, it ceases to be this, or in this. So it is clear that there are things that are sometimes in movement and sometimes at rest.

The claim that all things are sometimes at rest and sometimes in movement must at this point be brought together with the arguments just given. And, drawing on the present distinctions, we must again posit a starting-point, the very same one from which we started previously. For surely either all things are at rest or all are in movement, or some are at rest and some in movement. And if some are at rest and others are in movement, then, of necessity, either all of them are sometimes at rest and sometimes in movement, or some are always at rest and others always in movement, or some are always at rest, some always in movement, while some are sometimes at rest and sometimes in movement. It was stated previously[335] that it is not possible for all things to be at rest, but we must state it again now. For even if things are truly in this state, as certain people assert,[336] and being is unlimited and immovable, at least, it does not at all appear to be that way according to perception, but instead many beings appear to be in movement. If indeed, then, there is false belief, or belief at all, there is movement too; even if this belief is an imagination, or if things seem to be sometimes one way and sometimes another way. For imagination and belief seem to be sorts of movements. But to investigate this question at all, and to seek an argument when we are too well off to need an argument, is to be a bad judge of what is better

335. 253^{a}32–^{b}6.
336. E.g., Melissus (185^{a}32, 186^{a}16).

and what is worse,[337] and what is persuasive and what is not persuasive, and what is a starting-point and what is not a starting-point.

It is likewise impossible too for all things to be in movement or for some things to be always in movement and the others always at rest. For against all these views one mode of persuasion is enough; for we see some things that are sometimes in movement and sometimes at rest. So it is evident that for all things to be at rest or in movement continuously is just as impossible as for some to be always in movement while others are always at rest.

It remains, then, to get a theoretical grasp on whether all things are such as to be capable of being in movement and of being at rest, or whether some are like this while some are always at rest and some always in movement; for it is this latter that we must prove.

8.4
Whatever Is in Movement Is Moved by Something

Among things that cause movement or are moved, some cause movement or are moved coincidentally, some intrinsically—coincidentally, for example, by belonging to the movers or moved, or with respect to their parts, and intrinsically, not by belonging to the mover or the moved, or by a part of them causing movement or being moved.

Among the intrinsic movements, some are due to the thing itself, some due to something else, and some are by nature, others by force and contrary to nature. What is moved by itself is in effect moved by nature, as in the case of each animal (for an animal is moved by itself, and things that have the starting-point of movement within themselves we say are moved by nature; which is why the animal as a whole moves itself by nature, yet its body may be moved both by nature and contrary to nature; for it makes a difference what sort of movement it happens to be moved in and from what element it is composed). And of things that are moved by something else, some are moved by nature and some contrary to nature—contrary to nature, for example, earthen things moving upward and fire downward. Further, the parts of animals are often moved contrary to nature, that is, contrary to their [normal] positions and modes of movement. Also, that what is in movement is moved by something else is most of all evident in the case of things that are in movement contrary to nature, because it is clear that they are moved by something else. And after the contrary-to-nature cases, the next most evident of those that are in accord with nature, are the ones that move due to themselves—for example, animals; for what is unclear in this case is not whether they are moved by something, but rather how we should distinguish in them between the cause of movement and the moved; for just

337. *Met.* 1006[a]5–8.

as in ships and things not composed by nature, so too in animals the mover and the moved seem to be distinct, and in this way the entire animal moves itself.

What is most puzzling is the remaining case of those we last distinguished;[338] for of things moved by something else we posited that some are moved contrary to nature, while some are left opposed to these because they are moved by nature. It is these cases that produce the puzzle as to what they are moved by—for example, in the case **255^{a}1** of light and heavy things. For these are moved to the opposite places by force, but to their proper places—the light up, the heavy down—by nature. But what they are moved by is no longer evident, as it is when they are moved contrary to nature. For it is impossible to say that they are moved by themselves; for this is characteristic of life and is special to animate things. Also, they would have been capable of stopping themselves (I mean, for example, if a thing is cause of its own walking, it is also cause of its own not walking), so that if it is up to fire itself to spatially move upward, it is clear that it is up to it to spatially move downward as well. It is also unreasonable for things to move themselves with only one sort of movement, if at any rate they do move themselves.

Further, how is it possible for something that is continuous and naturally unified to move itself? For insofar as a thing is one and continuous not by contact [of its parts], it is unaffectable; but it is insofar as it is separated into parts that one part naturally affects and the other is naturally affected. Therefore, none of the things under discussion move themselves (for they are naturally unified), nor does anything else that is continuous, but rather the mover must be divided in each case from the moved, as we see in the case of inanimate things when an animate one moves them.

It turns out, however, that these things too are always moved by something, as would become apparent if we divided the causes. And it is in fact possible to apply to movers the division that was mentioned; for some of them are capable of moving things contrary to nature (for example, it is not by nature that a lever is capable of moving what is heavy), while other things are capable of doing so by nature (for example, the actively hot is able to move the potentially hot, and similarly in other such cases).

In the same way too what is movable by nature is what is potentially of a certain quality or quantity or in a certain place, when it has the corresponding starting-point within itself and not coincidentally (for the same thing may have a quality and a quantity, but the one might belong to the other coincidentally and not intrinsically). When fire and earth, then, are by force moved by something, they move contrary to nature, but they do so by nature when, while in potentiality, they proceed to their own activities.

But since something is said to be potentially something in many ways, this is the cause of its not being evident what such things are moved by—for example, fire up and earth down. The learner is potentially a scientific knower in another

338. 254^{b}20–22.

way than the one who already has the scientific knowledge but is not activating it. Sometimes[339] the potential becomes active, and always does so when what is capable of affecting and what is capable of being affected come together—for example, the learner from being potentially one thing becomes potentially another thing (for the one who has scientific knowledge but is not contemplating is in a way potentially a scientific knower, but not in the way he was before he learned). And whenever he is in this latter state, if nothing prevents him, he activates his scientific knowledge and contemplates; otherwise he would be in the contradictory state, that is, in one of ignorance.

The situation is similar in the case of natural things; for the cold is potentially hot, and whenever it changes, by this time it is fire, and it burns, unless something prevents or impedes it. And it is likewise with the heavy and the light; for the light comes to be from the heavy, for example, air from water (for water was first potentially air), and by the time it is light, it will at once be active, if nothing prevents it. The activity of the light is to be somewhere (up) and it is prevented whenever it is in the contrary place. And the situation is similar both in the case of quantity and in that of quality.

And yet this is what is being inquired about: why it is that the light and the heavy do move to their own place. And the cause is that it is natural for them to be somewhere, and this is the being for the light and the heavy, the one being determined by up and the other by down. Things, though, are potentially light and heavy in many ways, as was said; for when something is water, it is in a way at least potentially light, and when it is air, it is still potentially light (for something may impede it from being up). But if the impediment is removed, it becomes active and moves always upward. In a similar way a quality too changes to being active; for the possessor of scientific knowledge contemplates immediately, if nothing prevents it. And a quantity[340] is expanded [immediately], if nothing prevents it. And the one who moves the thing that remains there and prevents in a way causes movement and in a way does not—for example, the one who pulls away a supporting pillar or removes a stone from a wineskin in the water;[341] for he moves the thing coincidentally, just as the ball that bounced back was moved not by the wall but by the thrower. It is clear, therefore, that none of these things moves itself. However, each does have a starting-point of movement, not of causing movement or of affecting, but of being affected.

If, then, all things that are in movement are moved either by nature or contrary to nature and by force, and if things moved by force and contrary to nature are all moved by something, and something other than themselves, and if, in turn, things moved by nature are moved by something, both those moved by themselves and those not moved by themselves (for example, the light and the heavy—for they are moved either by what caused them to come to be and made them light or heavy, or

339. Reading ἐνίοτε.

340. I.e., one that is being compressed.

341. The wineskin is full of air, like a balloon, and is being held underwater by a stone, whose removal in a way causes it to float to the surface.

by what removed the thing that was impeding or preventing), then all things that are in movement are moved by something.

8.5
The Primary Mover Is Immovable

And this will happen in one of two ways. Either it is not through itself[342] that the mover moves the thing, but rather it is through something else that moves the mover, or it is through itself, and this latter mover will act either first after the last [movement] or through several intermediates—for example, the stick moves the stone, which is moved by the hand, which is moved by the human being, who is no longer moved by anything else.[343]

We say, then, that both things cause movement, both the last and the first mover, but more so the first; for it moves the last, but the last does not move the first, and without the first the last will not move anything, while the first will do so without the last—for example, the stick will not move anything if it is not moved by the human.

If, then, everything that is in movement must be moved by something, and either by something moved by something else or not, and if it is moved by something else, there must be some first mover that is not moved by anything else, while if the first mover is not moved by something else, there is no necessity for the other sort of mover (for it is impossible for a series of movers that are moved by something else to go on without limit; for of unlimited series there is no first member)—if, then, everything that is in movement is moved by something, and the first mover is moved, but not by anything else, it must be moved by itself.

Further, it is also possible to go through the same argument in the following way. For every mover moves something by means of something. For the mover moves either by means of itself or by means of something else—for example, a human being moves something either by means of himself or by means of a stick, and the wind knocked something down either by means of itself or by means of a stone driven by it. But it is impossible for a mover to move something without moving by means of itself that by means of which it moves the thing. But if it moves it by means of itself, there is no necessity for there to be anything else by means of which it causes movement while if there is something else by means of which it causes movement, there must be something that causes movement not by means of something [else] but by means of itself, or the series will go on without limit. If, then, a thing that is in movement causes movement, it is necessary for the series to stop and not go on without limit; for if the stick causes movement by being moved by the hand, the hand moves the stick, while if something else causes movement by means of the hand,

342. Reading δι' αὑτὸ.
343. *NE* 1139[a]31–[b]5.

then something else is the mover of the hand as well. Whenever, then, movement by means of something is at each stage caused by something else, there must be some prior thing that causes movement by means of itself. If, then, this thing is moved, but nothing else is the mover of it, it must move itself. So according to this argument too,
256b1 either what is moved is immediately moved by something that moves itself or at some time the series arrives at such a thing.

And if, in addition to the things we have just said, we investigate in the following way, these same conclusions will result. For if everything that is in movement is moved by something that is in movement, either this condition belongs to the mov-
5 ers coincidentally, so that each of them causes movement while being in movement, but not because it is itself in movement, or it does not belong coincidentally but intrinsically. In the first case, if the mover is in movement coincidentally, it is not necessary for it to be moved. But if this is so, clearly it is possible that at some time no being is in movement; for what is coincidental is not necessary but admits of
10 not being. If, then, we posit what is possible, nothing impossible will result, but presumably a falsehood may. But for there to be no movement is impossible; for it was proved previously[344] that there must always be movement.

Also, this result is reasonable. For there must be three things: the moved, the
15 mover, and that by means of which the mover moves. The moved must be in movement, but it is not necessary for it to move anything, while that by which the mover moves must both move something and be in movement; for it changes together with, at the same time as, and in the same respect as the moved. This is clear in the case of things that cause movement with respect to place; for the movers and the moveds must be making contact with each other up to a certain point. But what moves in such a way as not to be that by which it moves is immovable. And since
20 we see the last thing, what is capable of being moved but does not have a starting-point of movement, and also see what is moved by another but not by itself,[345] it is reasonable, not to say necessary, to suppose that there is also a third thing that causes movement while being immovable. That is why Anaxagoras speaks correctly
25 when he says that the [divine] understanding is unaffectable and unmixed,[346] since, at any rate, he makes it the starting-point of movement; for only in this way could it cause movement while being itself immovable, and only by being unmixed have supreme control.

But then if the mover is moved not coincidentally but necessarily, and if it were not moved, would not move anything, it is necessary for the mover, insofar as it is
30 moved, to be moved so that[347] it is in accord with the same form of movement [as the movement caused by it], or in accord with a distinct one. I mean, for example, either that what is heating something is itself being heated, what is making something

344. 7.1.
345. Reading ὑπ᾽ ἄλλου δὲ ἀλλ᾽ οὐχ ὑφ᾽ αὑτοῦ.
346. *DA* 429a18–27.
347. Reading ὥστε.

healthy is becoming healthy, and what is carrying something is being carried, or that what is making something healthy is being carried and what is carrying something is being increased in size. But it is evident that the latter is impossible; for one must speak [of the movements] by dividing as far as the indivisible [forms]—for example, one must say that if someone is teaching some topic in geometry, he is being taught **257a1**
this same topic, and that if he is throwing something, he is being thrown in the same manner of throwing. Or it may not be this way, but one kind may derive from another—for example, what is causing spatial movement is increasing in size, and what is causing this increase is being altered by something else, and what is causing 5
this alteration is being moved with another sort of movement. But this series must stop; for the sorts of movements are limited. And to say that the series bends back again, and that what is causing the alteration is spatially moving is to do the same as if one said immediately that what is causing spatial movement is spatially moving, and the one who is teaching is being taught (for it is clear that everything that is moved is also moved by the mover that is higher up in the series, and more so by the prior of 10
two movers). But this is impossible; for it follows that the one who is teaching is the one who is learning—although the one must have, and the other not have, scientific knowledge.

Further, what is still more unreasonable is that it follows that everything that is capable of causing movement is capable of being moved, if indeed everything that 15
is moved is moved by something that is moved. For it will then be capable of being moved, just as if someone said that everything that is capable of making something healthy is capable of being made healthy, and that everything capable of building is capable of being built, either immediately or through several intermediaries. I mean, for example, if everything that is capable of causing movement is capable of being moved by something else, but not with the same sort of movement with which it moves its neighbor, but with another sort (for example, what is capable of making 20
something healthy is capable of learning), and, by going up through the series, we at some time arrive at the same form of change, as we said earlier.[348] The first alternative is impossible, and the second is fabricated; for it is absurd that what is capable of altering something must be capable of being increased. It is not necessary, therefore, for what is moved always to be moved by something else that is itself moved. There- 25
fore, the series will stop. So either what is first moved will be moved by something at rest, or it will move itself.

But then if there were in fact any need to investigate whether it is what moves itself or what is moved by something else that is cause and starting-point of movement, everyone would take it to be the former; for what is itself intrinsically a cause is always prior as a cause[349] to what is itself a cause [but] in virtue of something else. So we 30

348. 257^a7–12.
349. Reading αἴτιον ἀεὶ πρότερον.

must investigate this by making a fresh start: if something moves itself, how and in what manner does it cause movement?

It is necessary for everything that is in movement to be divisible into parts that are always divisible; for it was proved previously[350] in our universal discussions about
257ᵇ1 nature that everything that is intrinsically moved is continuous. It is impossible, then, for what moves itself to move itself in its entirety; for it would be spatially moved as a whole, and it would spatially move itself with the same spatial movement, while being one and indivisible in form, and it would be altered and alter itself, so that it would be teaching and learning at the same time, and making healthy and being made
5 healthy with the same health. Further, it was determined[351] that it is the movable that is moved; but the movable is in movement potentially, not actually. But what is potentially proceeds to actuality, and movement is the incomplete actualization of what is movable. The mover, on the other hand, is already in activity—for example, what is hot heats, and, in general, what has the form generates. So, [if a thing can
10 move itself as a whole,] the same thing will be hot and not hot at the same time in the same respect, and likewise in each of the other cases in which the mover and the moved must be synonymous. Therefore, one part of what moves itself is the mover and another part is the moved.

But that it is not self-moving in such a way that each of the two parts are moved by the other is evident from the following considerations. For, first, there will be no first
15 mover at all, if each part does move the other[352] (for the prior mover is more of a cause of the movement than what comes next in the series, and more of a mover; for we saw that there are two ways to move things, by being moved by something else and by being self-moved; and what is further from the last thing that is moved is closer to the starting-point of movement than what is intermediate). Further, it is not necessary
20 for the part that is the mover to be moved except by itself. It is coincidental, therefore, if the other part moves it in return. We may take it, therefore, that it is possible for it not to move it. One part is moved, therefore, while the other is an immovable mover. Further, it is not necessary for the mover to be moved in return. On the contrary, either it must move something while being immovable or it must be moved by itself,
25 if indeed there must always be movement. Further, a thing would be moved with the movement it causes, so that what heats would be heated.

But then no primary thing that moves itself has one or more parts each of which moves itself. For if the whole is moved by itself, it will either be moved by one of its parts or the whole will be moved by the whole. If, then, it is moved by some part
30 being moved by itself, this part would be the primary self-mover (for separated it will move itself, while the whole will no longer do so). If, on the other hand, the whole is moved by the whole, it would be coincidental that the parts moved themselves. So,

350. 234ᵇ10–20.
351. 251ª9–16.
352. Reading εἴ γε ἑκάτερον κινήσει ἑκάτερον.

if it is not necessary that they do so, the case in which they are not moved by themselves may be taken. Of the whole [cause], therefore, one part will cause movement while being immovable, while the other will be moved; for only in this way will it be possible for something to be self-moved. **258a1**

Further, if indeed the whole moves itself, a part of it will cause movement and a part will be moved. AB will be moved, therefore, both by itself and by A alone. And since what causes movement may either be moved by something else or be immovable, and what is moved may either move something or move nothing, the self-mover must be composed of a part that is immovable but causes movement, and further of a part that is moved but does not necessarily move anything, but may or may not do so. For let A be the part that causes movement but is immovable, and B the part that is moved by A and moves C, which is moved by B but moves nothing; for even if C is in fact reached through several intermediates, let us suppose it is reached through only one. The whole ABC, then, moves itself. But if I take away C, AB will move itself, A causing movement and B being moved, while C will not move itself or be moved at all. But then neither will BC move itself without A; for B causes movement by being moved by something else, not by being moved by any part of itself. Therefore, AB alone moves itself. It is necessary, therefore, for what moves itself to have a part that causes movement but is immovable and a part that is moved but does not necessarily move anything, with either both parts making contact with each other, or one of the two with the other. If, then, the mover is continuous (for what is moved must be continuous), each part will make contact with the other. It is clear, then, that the whole moves itself not by a part being such as to move itself, but instead it moves itself as a whole, being moved and causing movement by a part of it being the mover and a part the moved. For it does not cause movement as a whole nor is it moved as a whole, but instead it is A that causes movement and B alone that is moved.

A puzzle arises, however, if one takes something away either from A (if the immovable mover is continuous) or from B (the part which is moved): will what remains of A cause movement or what remains of B be moved? For if so, AB would not be the primary thing that is moved by itself; for when something is taken away from AB, what remains of AB will still move itself. Or is it rather that nothing prevents either both parts or, at any rate, one part—the moved one—from being potentially divisible but actually undivided, if when divided it no longer has the same nature? In that case, nothing prevents the primary self-mover from being in what is potentially divisible. **258b1**

It is evident from these considerations, therefore, that there is a primary mover that is immovable; for [the series of] what is moved, and is moved by something else, stops either immediately at an immovable mover, or at something moved, but that moves itself and stops itself; in either case the primary mover of all moved things is immovable.

8.6
The Primary Mover Is One and Eternal

Since there must always be movement without intermission, there must be something eternal, whether one thing or more than one, that first causes movement. And what is a first mover must be immovable. Whether each of what is immovable but a mover is eternal is not relevant to the present argument, but that there must be something that is immovable and outside all change, both unconditionally and coincidentally, but which is capable of moving something else, will be clear if we investigate in the following way.

Let it be granted, then, if you wish, that in the case of certain things, it is possible for them at times to be and at times not to be, without any process of coming to be or passing away (for perhaps it is necessary, if something without parts at one time is and another time is not, that anything of that sort should, without undergoing any process of change,[353] at one time be and another time not be). And of the starting-points that are unmoving but can cause movement, let it also be possible for some of them to be at one time and not be at another. Even so, this is not possible for all of them; for it is clear that there is some cause of the self-movers being at one time and not being at another. For everything that moves itself must have magnitude, if nothing without parts is in movement, but for the mover to have it is not at all necessary, given what we have said.

That some things, then, come to be and some pass away, and that this happens continuously, of this, no immovable thing that is not eternal could be the cause, nor, again, could one that moves some things, while others move others.[354] For of the eternity and continuity neither each of them nor all can be the cause; for this state of things exists eternally and of necessity, while, though the sum of all those movers is unlimited, they do not all exist at the same time. It is clear, therefore, that even **259ᵃ1** if some of the immovable movers and many of the self-movers pass away countless times, and others succeed them, and even if one thing that is immovable moves one thing while another moves another, nonetheless there is something that encompasses them all, and this, which is beyond each of them, is the cause of some things existing and others not, and of the continuous process of change. And this causes the movement of these other movers, while they cause the movement of the other [beings].

If indeed, then, movement is eternal, the first mover will also be eternal, if there is one. But if there are several, there will be several eternal movers. But we must believe that there is one rather than many, and a limited rather than an unlimited number; for when the consequences are the same, we must always take the limited number; for in things that are by nature, what is limited and better must, if it is possible, be

353. *Sens.* 446ᵇ2–4, *Met.* 1002ᵇ6–7, 1044ᵇ21–22, 1043ᵇ14–18.
354. Reading οὐδ᾽ αὖ τῶν ἀεὶ μὲν ταδί κινούντων, τῶν δ᾽ ἕτερα.

present to a higher degree. And in fact one is enough, the first of the immovable movers, which, being eternal, will be the starting-point of movement for the others.

It is also evident from the following considerations that the first mover must be something that is one and eternal. For it has been proved that there must always be movement. But if it always is, it must be continuous; for in fact what always exists is continuous, while what is successive is not continuous. But then if it is continuous, it is one. And it is one if the mover is one and what it is moved also one; for if the movement were to be caused by one thing, then by another, the whole movement would not be continuous but successive.

On the basis of these considerations, then, one may be persuaded that there is some first immovable mover, and also by looking again at the starting-points of movers.[355] It is evident, then, that there are some beings that are at times in movement and at times at rest. And because of this it has become clear that it is not the case either that all things are in movement or that all are at rest or that some things are always at rest and the others always in movement; for things that play a double game and have the capacity to be in movement and to be at rest prove the truth about these alternatives. And since the existence of such things is clear to all, we wished to prove the nature of the other two sorts of things, and prove that there are some things that are always immovable and some things that are always in movement. Proceeding toward this end, and having established[356] that everything that is moved is moved by something, and that this thing is either immovable or moved, and that, if it is moved, it is moved either by itself or by another at each stage, we advanced[357] to the point of grasping that the starting-point of the movement of things that are in movement is, among moving things, the self-mover, but among all things, the immovable mover. But we see that beings that move themselves are manifestly of this sort—for example, **259b1** the animate ones and the kind of animals. And these in fact yielded the belief that perhaps it may be possible for movement to come about without having existed previously at all, because we see this happening in these things (for at one time they are unmoving and then they are in movement once again, so it seems). But[358] we must grasp the fact that animals move themselves with only one sort of movement, and that even regarding it they do not do so in the strict sense; for the cause does not derive from the animal itself, but rather there are other natural movements inherent in animals with which they do not move due to themselves, such as increase, decrease, and respiration, which each animal has while it is at rest and not moving with the movement that is due to itself. The cause of this is what encompasses the animal and many of the things that enter into it—for example, in some cases nourishment; for when nourishment is being concocted, animals sleep, and when it is being distributed [to the various parts] they wake up and move themselves, the first starting-point of

355. Reading τῶν κινούντων.
356. 8.4.
357. 8.5.
358. Reading δὲ.

movement being from the outside, which is why they are not always in continuous movement due to themselves; for the mover is something else, which is itself moving and changing in relation to each thing that moves itself. In all these, however, the first mover and the cause of their self-movement by themselves is moved, but coincidentally; for the body changes its place, so that what is in the body does so as well, and moves itself by means of leverage.[359]

On the basis of these considerations, then, one should be persuaded that if something belongs among the things that are [intrinsically] immovable but are themselves moved[360] coincidentally, it is incapable of causing continuous movement. So, if indeed there must be continuous movement, there must be a primary mover that is not moved even coincidentally, if there is to be, as we have said, an unceasing and undying movement among the beings, and if being itself is to remain in itself and in the same;[361] for if the starting-point remains as it is, the universe must also remain as it is, since it is in continuous relation to the starting-point. (But to be moved coincidentally by itself is not the same as to be moved coincidentally by something else; for to be moved coincidentally by something else belongs even to some starting-points in the heaven, those that are spatially moving with several spatial movements, while to be moved coincidentally by itself belongs only to things that pass away.)

Moreover, if there is in fact something that is always of this sort, moving something while itself remaining immovable and eternal, then the first thing that is moved **260ᵃ1** by it must be eternal as well. Indeed, this is clear also from the fact that there would not be any coming to be, passing away, or change with respect to other things unless something that is in movement causes the movement; for the immovable mover will always move things in the same way and with one movement, seeing that it itself does not change at all in relation to what is moved [by it]. But what is moved by something that, though it is moved, is moved already by what is immovable, because it is related to things now in one way and now in another, will not be the cause of the same movement, but instead, because of being in contrary places or forms, it will produce—being itself in movement—contrary movements in each of the other things and cause it at one time to be at rest and at another time in movement.[362]

It has become evident, then, from what we have said, what the resolution is of the puzzle we raised at the start[363] as to why it is that all things are not either in movement or at rest, or why some are not always in movement and the others always at rest, but instead some are sometimes in movement and sometimes not. For the cause of this is now clear, that some things are moved by an eternal immovable mover, which is why they are always in movement, while some things are moved by a moved and changing mover, so that they too must change. But the immovable mover, as was

359. *MA* 701ᵇ1–32.
360. Reading αὐτῶν κινουμένων.
361. I.e., within the same limits.
362. *GC* 336ᵃ23–ᵇ10, *Met.* 1072ᵃ10–18.
363. 253ᵃ22–24.

said, seeing that it remains simple, selfsame, and in the same state, will move things with a movement that is one and simple.

8.7
Spatial Movement Is the Primary Sort of Movement

This will also be made more evident, however, if we make a different start where these issues are concerned. For we must investigate[364] whether it is possible to be a sort of continuous movement or not, and, if it is possible, what sort it is, and which sort of movement is primary; for if indeed there must always be movement, and if a particular sort is primary and continuous, it is clear that the primary mover causes this sort of movement, which must be one and the same, continuous, and primary.

Since there are three sorts of movement: that with respect to magnitude, that with respect to affection, and that with respect to place, it is this last, which we call "spatial movement," that must be primary. For it is impossible for there to be increase without previous alteration; for what increases is in one way increased by what is like itself, but in another way by what is unlike itself; for contrary is said to nourish contrary. But everything gets added by becoming like to like.[365] It is necessary, then, for this change to a contrary to be an alteration. But if there is in fact alteration, there must be something causing the alteration and making the actively hot from the **$260^{b}1$** potentially hot. It is clear, then, that the mover is not always in the same situation, but sometimes closer, sometimes farther away, from what is altered. But without spatial movement this cannot happen. If, therefore, there must always be movement, there must also always be spatial movement as the primary sort of movement; and if there is a primary sort and a posterior sort of spatial movement, there must always be the primary sort.

Further, the starting-point of all affections is condensation and rarefaction; for heavy and light, soft and hard, hot and cold, seem to be sorts of density or rarity. And condensation and rarefaction are aggregation and disaggregation, in virtue of which substances are said to come to be and pass away. But things that aggregate and disaggregate must change with respect to place. But then the magnitude of what increases and decreases also changes with respect to place.

Further, it will be evident also from the following investigation that spatial movement is primary. For, as in the case of other things, so too in the case of movement, it is said to be primary in many ways. And what is said to be prior is that without which the other things will not exist, while it can exist without them, and there is also priority in time and with respect to substance. So, since there must be movement continuously, and it would exist continuously either if it were continuous or if it were

364. $261^{a}27$–$265^{a}12$.
365. *DA* $416^{a}30$–$^{b}9$.

successive, but more so if it were continuous, and since it would be better for it to be continuous than successive, and we always suppose the better to exist in nature, if it is possible, and it is possible for movement to be continuous (this will be proved later;[366] for now let us assume it), and since no other movement can be continuous except spatial movement, spatial movement must be primary. For there is no necessity for what spatially moves either to increase or to alter, nor of course to come to be or pass away. But none of these other movements can exist without the existence of the continuous movement, the movement that the primary mover causes.

Further, spatial movement is primary in time; for this is the only sort of movement possible for eternal things to move with. [It might be objected,] however, that for each particular thing that comes to be, spatial movement must be the last of its movements; for after a thing comes to be, first alteration and increase occur, while spatial movement is a movement that belongs to things that are already completed. But prior to this there must be something else that is in movement with a spatial movement, which will be the cause even of the coming to be of the things that come to be, though not itself coming to be (for example, what begets is the cause of what is begotten), although it might seem that coming to be is the primary sort of movement, because the thing must first come to be. But though this is so in the case of any particular thing that comes to be, nonetheless there must be something in movement that is prior to the things that come to be, which does not itself come to be, and something else prior to this. And since coming to be cannot be primary (for then all things in movement would admit of passing away), it is clear that none of the movements that are next in order can be prior to spatial movement. By "the ones next in order" I mean increase, then alteration, decrease, and passing away; for all these are posterior to coming to be, so that if not even coming to be is prior to spatial movement, none of the other changes is either.

In general, it appears that what comes to be is incomplete and proceeds to a starting-point, so that what is posterior in relation to coming to be is prior in relation to nature. And spatial movement is the last sort to belong to all the things that are coming to be. That is why, due to a lack of the [requisite] instrumental part,[367] some living things are entirely without movement such as plants and many kinds of animals, while movement belongs to others when they are becoming complete. So, if spatial movement belongs more to the things that have more fully achieved their due nature, this sort of movement would also be prior to the others with respect to substance—both because of the foregoing considerations and because what is moved in a spatial movement departs less from its substance than in any other sort of movement; for it alone does not at all change what it is, while what is altered changes its quality, and what increases and decreases changes its quantity. Above all it is clear that this movement—movement with respect to place—is the movement with which

366. 8.8.
367. Reading τοῦ ὀργάνου.

what moves itself most of all moves in the strict sense. And yet it is this—what moves itself—that we say is the starting-point of things that are moved and of things that are movers and is primary among things moved.

It is evident from these considerations, therefore, that spatial movement is the primary sort of movement. But we must now prove what sort of spatial movement is primary. At the same time, the truth of the assumption we made both just now and previously,[368] that it is possible for there to be a movement that is continuous and eternal, will be evident from this same methodical inquiry.

That none of the other sorts of movement can be continuous is evident from what follows. For all movements and changes are from opposites to opposites—for example, of coming to be and passing away, being and not being are the defining marks; of alteration, they are the contrary affections; and of increase and decrease, they are greatness and smallness, or complete and incomplete magnitude. And the movements to contraries are contrary ones. But what is not always in movement with a certain movement, though it existed previously, must previously have been **$261^{b}1$** at rest. It is evident, then, that what changes will be at rest in the contrary. It is likewise too in the case of changes; for passing away and coming to be, whether unconditional or a particular sort in relation to a particular sort, are opposites. So, if it is impossible for something to be changing in opposite ways at the same time, change will not be continuous, but there will be an interval of time between these opposed changes. For it makes no difference whether contradictory changes are contrary or not (for this is not being used in the argument), as long as they cannot be present in the same thing at the same time. Nor does it make a difference if it is not necessary for the thing to be at rest in the contradictory state, or if change is contrary to rest (for presumably a non-being cannot be at rest, and passing away is change to non-being), but only whether there is a time interval between the opposed changes; for that way the change is not continuous; for even in the previous cases the contrariety [of the states] was not the useful thing; instead, the impossibility of their existing at the same time was.

Nor need one be troubled by the fact that the same thing will have more than one contrary—for example, that movement is contrary to rest and movement to the contrary. We have to grasp only this: that in a way movement is opposed both to the contrary movement and to rest, just as the equal and the moderate are opposed both to what exceeds it and what is exceeded by it, and that it is not possible for opposites, whether movements or changes, to be present at the same time. Further, in the case of coming to be and passing away, it would seem to be entirely absurd if what had come to be must pass away immediately without remaining for any interval of time. So on the basis of these cases one should be persuaded with respect to the others; for it is natural that the same thing holds in all cases.

368. $260^{b}23$, $253^{a}29$.

8.8
Only Circular Spatial Movement Can Be Continuous (1)

We are now in a position to state that it is possible for there to be an unlimited movement that is one and continuous, and that this is circular movement. For everything that is in spatial movement moves either with a circular, a rectilinear, or a mixed movement, so that if one of the former two is not continuous, the combination of both cannot be continuous either. It is clear that what is in spatial movement in a limited straight line is not in continuous spatial movement; for it turns back, and what turns back in a straight line is moved with contrary movements. For with respect to place, contrary movements are the up to the down, the forward to the backward, and the left to the right; for these are the contrarieties of place. But we have previously determined[369] what the one and continuous movement is, that it is the movement of one thing, in one interval of time, and in something undifferentiated with respect to form (for we saw[370] that there were three things: the thing in movement, for example, a human or a god; when it moves, that is, the time; and third, what it is in, and this is place, affection, form, or magnitude). But contraries differ in form and are not one; the differences in place being those we mentioned. And a sign that movement from A to B is contrary to movement from B to A is the fact that they stop or pause each other if they occur at the same time. And likewise in the case of a circle—for example, movement from A [clockwise] to B is contrary to movement from A [counterclockwise] to C (for they stop each other, even if they are continuous and do not turn back, because contraries destroy and prevent each other), while lateral movement is not contrary to upward movement.

It is most of all evident, however, that movement in a straight line cannot be continuous from the fact that what turns back must stop, not only if it is moving in a straight line, but even if it is spatially moving in a circle. For circular spatial movement and moving in a circle are not the same; for at one time what moves in a circle is in connected movement, while at another time it turns back again to the same point from which it began.

One may be persuaded that such movement must come to a stop not only on the basis of perception but also on the basis of argument. We may start with this. For when there are three things, starting-point, mid-point, and end-point, the mid-point is both end-point and starting-point in relation to the other two, and is one in number, but two in account. Further, potentially is distinct from actively. So any point between the extremes of a straight line is potentially a mid-point, but not actively so, unless what is in movement divides the line there by coming to a standstill and starting to move again. In this way the mid-point becomes starting-point and end-point—a starting-point of the later part, and an end-point of the first part

369. 5.4.
370. 227b21–228a6.

(I mean, for example, if in its spatial movement A comes to a standstill at B and then travels again to C). But when its spatial movement is continuous, A cannot either have arrived at or have departed from point B, but can only be there in a now, and not in any interval of time except the one for which that now marks a division: the whole time. But if someone were to grant that it has arrived and has departed, A will always be at a stop when it is in spatial movement; for it is impossible for A to have arrived at and to have departed from B at the same time. It will do so, therefore, at distinct points **262**^{b}**1** of time. Therefore, there will be a time interval between them. So A will be at rest at B, and similarly at the other points; for the same argument will apply to all. But[371] whenever the thing in spatial movement A uses the mid-point B as both end-point and starting-point, it must be at a standstill, because of making it be both, just as one might also do by understanding it that way. But A is the point it has departed from as a starting-point, and C is the one it arrives at when it reaches the end-point and comes to a standstill.

That is why we must also state this in response to the following puzzle. For if line E is equal to line F, and A is in continuous spatial movement from the extremity E to C, and A is at point B at the same time as D is in spatial movement from the extremity F to the other extremity G in a uniform way and with the same speed as A, D will arrive at G before A arrives at C [Fig. 6].

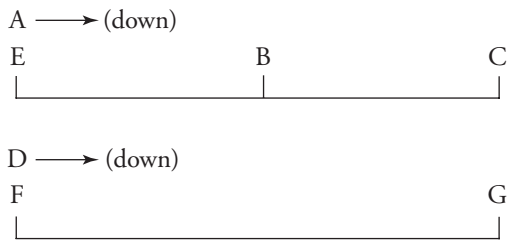

Fig. 6

For what started and departed earlier must arrive earlier. Therefore,[372] A has not arrived at and departed from B at the same time, and that is why it lags behind. For if it does so at the same time, it will not lag behind; on the contrary, to lag behind it must come to a standstill. We must not grant, therefore, that at the time A arrived at B, D was at the same time in movement from F (for if A has arrived at B, its departure will also have occurred, and not at the same time), but A was there in a temporal instant and not in a temporal interval.

In this case, then, where movement is continuous, it is impossible to speak this way. In the case of something that turns back, however, it is necessary to speak this way. For if G spatially moves to D and, turning back, spatially moves back down

371. Reading δὲ.
372. Reading ἄρα.

again, it has used the extremity D as both an end-point and a starting-point, one point as two. That is why it must be at a standstill, and has not arrived at and departed from D at the same time; for then it would be there and not there in the same now. But then we surely cannot state the same resolution over again; for it is not possible to state that G is at D in an instant, and that it has not arrived at or departed from it. For it must arrive at an actual end-point, not a potential one. For points in the middle are potential, while this one is actual, and an end-point from below, a starting-point **263a1** from above—related to the movements [of D], therefore, in the same ways. What turns back along a straight line must, therefore, come to a standstill. Therefore, it is not possible for continuous movement in a straight line to be eternal.

One must reply in the same way to those who pose Zeno's argument and ask whether one must always traverse the half, seeing that these halves are unlimited in number, and it is impossible to traverse what is unlimited. Or to those who pose the same argument in another way and require that during the movement we count the half movement before the whole as we come to each halfway point, so that in traversing the whole it comes about that we have counted an unlimited number. And this is admittedly impossible.

In our first accounts concerned with movement[373] we resolved [this puzzle] due to time having unlimited parts within itself; for nothing absurd follows if in an unlimited time one traverses unlimited distances. And the unlimited is present as much in the length as in the time. But though this resolution is adequate relative to the questioner (for the question is whether in a limited time it is possible to traverse or count unlimited things), relative to the thing and the truth it is not adequate; for if someone sets aside the issue of length, and the question of whether in a limited time one can traverse an unlimited number of distances, and inquires about these questions focusing in on the time itself (for the time is divisible without limit), this resolution will no longer be adequate. But it is the truth that must be stated, precisely the one that we stated in our accounts just now.[374] For if someone divides a continuous line into two halves, he treats one point as two; for he makes it both a starting-point and an end-point. And both counting and dividing in half do this. And if one divides in this way, neither the line nor the movement will be continuous; for continuous movement is over a continuum, and in a continuum there is an unlimited number of halves, not in actuality, however, but in potentiality. But if one makes them actual, one will not make the movement continuous, but rather come to a standstill, which is manifestly precisely what happens when one counts the halves; for one must count **263b1** one point twice; for the end-point of one half will be the starting-point of the other, if one does not count the continuous line as one, but as two halves. So one must reply to the question of whether it is possible to traverse unlimited things either in time or in length that in one way it is and in another way it is not. For in the case of actually

373. 233a21–31, 6.9.
374. 262a19–b21.

unlimited things it is not possible, but in the case of potentially unlimited ones it is possible; for a thing moving continuously has coincidentally traversed unlimited things, while unconditionally it has not; for a line is coincidentally an unlimited number of halves, but its substance—that is, its being—is something else.

It is also clear that unless one posits that the point of time that divides earlier from later always belongs to the later, so far as the thing is concerned, the same thing will both be and not be at the same time, and when it has come to be it will not be. The point, though, is common to both—that is, to both the earlier and the later—and is the same and one in number, though not the same in account (for it is end-point of one and starting-point of the other). But so far as the thing is concerned, it always belongs to its later affection. Let the time be ACB, and the thing D, which is white in time A and not white in time B. In time C, therefore, it is white and not white. For it is true to say that it is white in any time in A, if it was white in all this time, and in B that it is not white. But C is in both times. Therefore, we must not grant that it is white in all of A, but rather at all times except the last now, which is C; and this already belongs to the later period.[375] And if not white was coming to be and white passing away in all of A, not white has come to be and white has passed away at C. So this is the first time at which it is true to say that the thing is white or that it is not white. Otherwise, at the time it has come to be, the white will not exist and at the time it has passed away, it will exist. Alternatively, it must be white and not white at the same time, and, in general, must be and not be.

But if whatever exists without having previously existed must come to be, and if when it is coming to be, it does not exist, time cannot be divisible into indivisible times. For if D was coming to be white in time A, and has at once come to be white and is white in another indivisible but contiguous time B (if D was coming to be white in A, it was not white, but it is white in B), there must be an intermediate coming to be, so that there must also be a time in which D was still coming to be white. The same argument does not apply to those who say that there are no indivisible **264^{a}1** times, but that D has come to be and is white at the extreme point of that same time, with which nothing is contiguous or successive. But indivisible times are successive. And it is evident that if D was coming to be white in the whole time A, there is no time in which it has come to be white and was coming to be white that is greater than the whole time in which it only was coming to be white.

By these and other such arguments, which properly belong to the subject, one may be persuaded. But the result would seem to be the same if we investigate the issue logico-linguistically as follows. For everything that is in movement continuously, if it is not knocked aside by anything else, then precisely the point it arrived at by its spatial movement is the one it was previously spatially moving toward—for example, if something arrived at B, it was spatially moving toward B, and not [merely] when it was in the neighborhood of B, but as soon as it started to move; for why would

375. Reading τὸ ὕστερον.

it be doing so now rather than previously? And similarly in the case of the other [sorts of movement and change]. Suppose, then, that what is in spatial movement from A toward C,[376] when it arrives at C, will again return to A with a continuous movement. At the time, therefore, that it is spatially moving from A toward C, it is also spatially moving to A with a movement that is from C, so that it will have contrary movements at the same time; for movements [in contrary directions] along a straight line are contraries. At the same time, it will also be changing from what it is not [at C]. If, then, this is impossible, it must come to a standstill at C. Its movement, therefore, is not one movement; for a movement that is interrupted by a stop is not one movement.

Further, this is also evident, as a more universal point about all sorts of movement, from the following considerations. For if everything that is in movement is moved with one of the sorts of movement already mentioned and is at rest with the opposite sorts of rest (for we saw that there is no other beyond these), what does not always move with this sort of movement (I mean the ones that are distinct in form, not if some part of the whole is) must previously have been at rest in the opposite state of rest (for rest is privation of movement). If, then, movements in contrary directions along a straight line are contraries and it is not possible to be in contrary movements at the same time, what is in spatial movement from A to C would not at the same time be in spatial movement from C to A. And since it is not in both spatial movements at the same time, but will move with the latter movement, it must be at rest at C; for this is the sort of rest that is opposite to the movement from C [to A]. It is clear, therefore, from these considerations that the movement will not be continuous.

264b1 Further, there is also this argument, which more properly belongs to the topic than the ones mentioned. For suppose that the not white has passed away at the same time as the white has come to be. If, then, the alteration to white and from white is continuous and [the white thing] does not remain [white] for some time, at the same time as the not white has passed away the white has come to be and the not white has come to be; for the time of the three will be the same. Further, if time is continuous, it does not follow that movement is continuous, but that it is successive. And how could the extreme point of contraries—for example, of whiteness and blackness—be the same?

A movement along the circumference of a circle, on the other hand, will be one and continuous; for nothing impossible follows; for what is moving from A will at the same time be moving to A with the same tendency (for what it will arrive at is what it is moving to), but without having contrary or opposite movements at the same time; for not every movement to A is contrary or opposite to a movement from A, but rather they are contrary only if they are along a straight line (for it has contraries with respect to place, such as the extremities of a diameter, since they are furthest apart), and opposite if they are along the same line. So there is nothing to prevent

376. Reading ἐπὶ τὸ Γ.

the [circular] movement from being continuous and without temporal intermission; for circular movement is movement from a point to itself, while movement along a straight line is from one point to another.

Also, circular movement is never in the same things, while rectilinear movement is repeatedly in the same things.[377] It is possible for what repeatedly comes to be now in one thing and now in another to move continuously, but it is not possible for what always comes to be in the same things; for then it would of necessity have contrary movements at the same time. So it is not possible for a thing to move continuously in a semicircle or in any other part of the circumference; for it would of necessity make the same movement repeatedly and change to contrary changes; for this movement does not unite the starting-point and the limit. But circular movement does unite them, and it alone is complete.[378]

It is evident from this division that none of the other sorts of movements can be continuous either; for in all the others we find the same things being traversed repeatedly—for example, in alteration there are the intermediate stages, in quantitative change the intermediate magnitudes, and in coming to be and passing away it is the same way; for it makes no difference whether we make the stages in the change few or many, or whether we add or subtract a stage in between; in either case we find the same things being traversed repeatedly.

It is clear, then, from these considerations that those natural scientists who claim that all perceptible things are always in movement do not speak well; for things must move with one of these sorts of movement, and especially, according to them, alteration; for things are always in flux, they say, and in decay, and further, they speak even of coming to be and passing away as alteration.[379] The present argument, by contrast, states universally that it is not possible to move continuously with any sort of movement except for the circular one, so that nothing can do so either with alteration or with increase.

Let so much be said by us, then, to prove that there is neither unlimited nor continuous change except for circular spatial movement.

377. The things in question are the starting-point and end-point of the movements, since it is the fact that these are united in the case of circular but not rectilinear movement that makes the former continuous and the latter not (264^{b}27–28). To say that a movement is *in* these, however, is not to say that it is between them, but that it has its coming to be in them (264^{b}21–22). Thus what makes circular movement continuous is that its starting-point now comes to be in one thing (one point on the circumference), now in another, and that this is also its end-point (since the two are united), so that these movements are never contraries or opposites.

378. *Cael.* 286^{b}18–23.

379. 187^{a}30.

8.9
Only Circular Spatial Movement Can Be Continuous (2)

And it is clear that circular spatial movement is the primary sort of spatial movement. For every spatial movement, as we said earlier,[380] is either circular, rectilinear, or a mixture of the two. And the first two must be prior to the last; for it is composed of them. And the circular is prior to the rectilinear; for it is simpler and more complete. For a straight line that is unlimited cannot be traversed (for such an unlimited straight line does not exist; and even if it did, nothing would traverse it; for the impossible does not happen, and it is impossible to traverse an unlimited line). But in the case of movement along a limited line, if it turns back, it is composed of two movements, while if it does not turn back, it is incomplete and capable of passing away. And the complete is prior to the incomplete, in nature, in account, and in time, and what is incapable of passing away to what is capable of passing away.[381]

Further, what can be eternal is prior to what cannot be eternal. But in fact circular movement can be eternal, but none of the other sorts, whether of spatial movement or of any other sort whatever, can be so; for rest must occur, and if rest occurs, the movement has passed away.

And it is reasonable that circular movement should be one and continuous, and that rectilinear movement should not; for of movement along a straight line there is a definite starting-point, end-point, and mid-point, which are all contained in it in such a way that there is a point from which what is in movement will start and a point at which it will end (for everything is at rest at the limits, whether the one from which it moves or the one to which), but of movement along the circumference of a circle they are indefinite; for why should any point on the line be a limit more than any other? For each point is alike a starting-point, a mid-point, and an end-point, so that what is in movement is always at the starting-point and at the end-point and **265b1** also never at them. This is why a revolving sphere is in a way both in movement and at rest; for it occupies the same place. The cause of this is that all these features belong to the center-point; for in fact it is starting-point, mid-point, and end-point of the magnitude. So because this point is outside the circumference, there is nowhere for what is in spatial movement to rest as if it has traversed its course (for it is always spatially moving around a mid-point but not to an extreme one), and because of this, the whole is in a way always at rest and remains,[382] and is also always in continuous movement. And there is this reciprocal relation; for in fact because the revolution is also the measure of movements, it must be primary (for everything is measured by what is primary), and because it is primary, it is the measure of the other sorts of movement.

380. 261b29.
381. *Met.* 1050b6–20.
382. Reading διὰ τὸ τοῦτο μένειν.

Further, only circular movement can be regular; for things in rectilinear movement move spatially in an irregular way from the starting-point and to the end-point; for the further everything removes itself from its resting point, the faster is its spatial movement. Circular movement, on the other hand, alone has neither starting-point nor end-point naturally within itself, but rather has them outside.

The fact that spatial movement with respect to place is the primary sort of movement is attested by all those thinkers who have made mention of movement; for they assign the starting-points of movement to things that cause movement of this sort. For aggregation and disaggregation are movements with respect to place, and it is in this way that love and strife move things; for strife disaggregates and love aggregates them.[383] And the [divine] understanding, Anaxagoras says, disaggregates things as the first cause of movement. The same is true of those[384] who mention no cause of this sort but say that things are in movement because of the void. For they too say that nature is moved with movement with respect to place (for movement because of the void is spatial movement and, as it were, in place), and they think that none of the other movements belongs to the primary things but only to their compounds; for they also say that increase and decrease and alteration result from the aggregation and disaggregation of the indivisible bodies. It is the same way too with those[385] who make condensation and rarefaction the cause of coming to be and passing away; for in fact they regulate these by aggregation and disaggregation.

Further, beyond these there are those[386] who make soul the cause of movement; for they say that what moves itself is the starting-point of all things that are in movement, and an animal and every animate thing moves itself with movement with respect to place.

Also, we say that only what is in movement with respect to place is in movement in the strict sense; if it remains at rest in the same place, but increases or decreases or happens to alter, it is in movement in a way, but we do not say that it is in movement unconditionally. **266^{a}1**

That there always was and always will be movement throughout all time, then, what the starting-point of eternal movement is, and further, what the primary movement is, what sort of movement can alone be eternal, and that the primary mover is immovable, has now been stated.

383. 250^{b}26.
384. Leucippus and Democritus (213^{b}2–22).
385. 187^{a}12–16.
386. Plato and the Platonists.

8.10
The Primary Mover

Let us now say that this mover must be without parts and without magnitude, after first determining some prior issues concerning it. And one of these is that no limited thing can cause movement for an unlimited time. For there are three things: the mover, the moved, and third, that in which, time. And these are either all unlimited, all limited, or some are limited—that is, two or one. Let, then, A be the mover, B be the moved, and C the unlimited time. Then let D move some part E of B. Not, then, in a time equal to C; for what is greater takes place in a greater time. So F, the time of the movement, is not unlimited. By adding to D I will use up A, and by adding to E I will use up B. But I will not use up the time by always taking a corresponding amount from it; for it is unlimited. So all of A will move the whole of B in a limited time period of C. It is not possible, therefore, for an unlimited movement to be due to a limited mover.

It is evident, then, that something limited cannot cause movement for an unlimited time. And that, in general, an unlimited capacity cannot be present in a limited magnitude will become clear from the following considerations. For let the greater capacity be the one that always produces an equal effect in a shorter time, as in the case of heating, sweetening, or throwing—in fact, of causing movement in general. What is affected, therefore, must undergo some effect due to the limited magnitude that has an unlimited capacity, and an effect greater than one due to any other; for the unlimited one is greater than any other. But then this cannot take any time at all. For if A is the time in which an unlimited strength heated or pushed something, while in time AB some limited one did so, by continually adding to this strength a **266b1** greater limited one I will eventually have caused the movement in question in time A; for by continually adding a limited quantity I will exceed every definite quantity, and by subtracting, fall short of any definite one in like manner. The limited capacity, therefore, will cause a movement in a time equal to that taken by the unlimited one. But this is impossible. No limited thing, therefore, can have an unlimited capacity.

Neither, moreover, can a limited capacity be present in an unlimited magnitude. And yet it is possible for a greater capacity to be present in a lesser magnitude. True, but a still greater capacity can be present in a greater magnitude. Let AB, then, be an unlimited magnitude. [A part of it] BC, then, has a certain capacity, which in a certain time EF caused movement D. If, then, I take twice BC, it will cause the movement in half the time EF (assuming this to be the proportion), so that it will move in the time FH. Therefore, by always taking in this way I will never exhaust AB, while I will always be taking a smaller part of the given time. The capacity, therefore, will be unlimited; for it exceeds every limited capacity, if, at any rate, every limited capacity must also take a limited time to do what it does (for if such-and-such capacity takes such-and-such time, a greater capacity will cause the movement in a shorter but still definite time that is inversely proportional to the capacity). But a capacity must

always be unlimited—just as a number or a magnitude is—if it exceeds every definite one. This may also be proved in the following way; for if we take a certain capacity, the same in kind as the one in the unlimited magnitude, but this one being in a limited magnitude, it will be commensurable with the limited capacity in the unlimited magnitude. It is clear from these considerations, then, that it is not possible for an unlimited capacity to be present in a limited magnitude, nor for a limited capacity to be present in an unlimited one.

But in the case of spatial movements it will be well to go through a puzzle first. For if everything in movement is moved by something (that is, the ones that do not move themselves), how is it that some will move continuously even when they are not in contact with their mover—for example, projectiles? And if the mover at the same time moves something else, such as the air, which causes movement by being moved, it is likewise impossible for the air to be in movement when the first mover is not in contact with it and moving it—on the contrary, all the things will be in movement at the same time and will stop whenever the first mover stops, even if, like a magnet, it **267^{a}1** makes what it has moved capable of causing movement.

We must, then, say this: that the first mover makes the air, water, or whatever naturally moves or is moved, capable of causing movement. However, this does not at the same time stop moving and stop being moved, but rather it stops being moved at the same time as its mover stops moving it, but it still causes movement, which is why it moves something else contiguous to it, and the same account applies to the latter. But it begins to stop whenever the capacity to cause movement becomes less in each contiguous thing. And it finally stops when the previous one no longer makes the next one a mover, but only something moved. And these things, the mover, on the one hand, the moved, on the other, must stop at the same time, as must the whole movement. This movement comes to be in things that admit of being at one time in movement and at another time at rest, and it is not continuous, though it appears to be; for it occurs either in successive things or in things making contact; for there is not one mover, but movers contiguous to each other. That is why it is in air and in water that this sort of movement occurs—the sort that some people call "reciprocal replacement." But it is impossible to resolve the puzzles raised in any other way than the one that was mentioned. In reciprocal replacement, by contrast, everything would at the same time produce movement and be in movement, and so also stop at the same time. But as things stand it appears that there is one thing in continuous movement. What, then, is it due to? For it is not due to the same thing [that started it moving].

Since among the beings there must be continuous movement, and this is one movement, it must be a certain magnitude's one movement (for what is without magnitude does not move)—it must be of one thing and due to one thing (for otherwise it will not be continuous, but rather a series of movements contiguous to each other and divided). The mover, then, if it is one mover, will cause movement either by being moved or by being immovable. If, then, it is moved, it will itself have to

follow along and undergo change, and at the same time be moved by something, so
267b1 that the series will stop when it will arrive at a movement that is due to something immovable. For this of necessity does not undergo change along with the others, but will always be capable of causing movement (for to cause movement in this way involves no labor[387]), and this movement is regular, either alone or more so than any other; for the mover is never subject to any change. And neither must what is moved
5 be subject to any change in relation to the mover, if its movement is to remain the same. Besides,[388] it is necessary, then, for the mover to be either at the center or on the circumference of a circle; for these are its starting-points. But the things closest to the mover move fastest. And such is the movement of the circumference. That, therefore, is where the mover is.

There is a puzzle as to whether it is possible for anything in movement to cause
10 movement continuously, but not like something that pushes again and again, where [the movement caused is] continuous by being successive;[389] for such a mover must either always push or pull or both, or another thing must receive one from another and again another mover, as was mentioned a moment ago in the case of projectiles,[390] if the air, being divisible, causes movement by one part always being moved after
15 another. In either case there cannot be one movement, but a contiguous series. The only continuous movement, therefore, is that which the immovable mover causes; for it always remains in the same state and so will continuously stand in the same relation to what it moves.

Now that these points are determined, it is evident that it is impossible for the first and immovable mover to have any magnitude. For if it has magnitude, this must be
20 either limited or unlimited. But that there cannot be an unlimited magnitude was proved previously in the *Physics*,[391] and it has been proved just now[392] that a limited magnitude cannot have an unlimited capacity, and that something cannot be moved for an unlimited time by a limited magnitude. But the primary mover causes eternal
25 movement and for an unlimited time. It is evident, therefore, that it is indivisible and without parts, and has no magnitude.

387. *Cael.* 284a11–18, *Met.* 1050b22–28.
388. Reading δὲ.
389. Reading συνεχής.
390. 266b28–267a8.
391. 3.5.
392. 266a12–b6.

APPENDIX

7.3 (ALTERNATE TEXT)[393]

That all things that are altered are altered due to perceptibles, and that there is alteration only of those things that are intrinsically affected by these, is a fact that we may get a theoretical grasp on from the following considerations. For of the others, it seems that alteration belongs most of all to figures and shapes, and in states, that is, in losing or acquiring them. But it does not exist in these either. Instead, these come to be when something is altered (for example, when the matter is condensed or rarified, heated or cooled); but this is not alteration. For we do not say that the shape [produced] is that from which the shape of the statue is composed, nor that it is the matter from which the candle or the bed is composed, but using a paronym, we say that the first is brazen, the second waxen, and the third wooden. On the other hand, we do say this of the things that undergo alterations; for we say that the bronze is wet, hot, or hard (and not only in this way, but also that the wet and the hard are bronze), speaking homonymously of the matter by using the [name of] the affection. Since, then, that from which the shape and the figure and the thing that comes to be are not things that what is shaped from them is homonymously said to be, while what undergoes alteration is homonymously said to be the affections, it is evident that alteration occurs only in perceptibles. **245b19** 21 23 25 27 29 **246a21** 23

Further, it would also be absurd in another way. For to say that a human being or a house that has achieved its end has been altered is ridiculous, that is, if we say that the completion of the house—its receiving its coping-stone or roof-tile—is an alteration, or that the house is altered when it is coped or tiled. It is clear, then, that alteration is not found in things coming to be. 25 27

Nor does it occur in states. For states are virtues and vices, but every virtue or vice is in [the category of] the relative, just as health is a sort of proportion of hot and cold things, either those within or in relation to what encompasses it. Likewise, beauty and strength are in [the category of] the relative. For they are certain dispositions of the best part in relation to the best good. And by "best" I mean what preserves and disposes according to nature. Since, then, both virtues and vices belong in [the category of] the relative, and these are not comings to be, nor is there a coming to be of them, or any alteration of them at all, it is evident that there is no alteration at all in the case of states. 29 **246b21** 23 25

Nor, then, is there any alteration in the case of the virtues and vices of the soul. For virtue is a sort of completion (for each thing is most complete at the time when it reaches its own proper virtue, and is most in accord with its nature, just as a circular 27

393. Text: S. Maso, C. Natali, and G. Seel (eds.), *Reading Aristotle's Physics VII.3: What Is Alteration?* (Las Vegas, 2012), 28–33.

29 thing is most in accord with its nature when it is most a circle), while vice is the passing away of and departure from these completions.

247ᵃ20 Both the acquisition of virtue and the loss of vice occur because something is altered; however, neither of these is an alteration. But that something is altered is clear. For virtue is a sort of being unaffected or being affected in such-and-such a way, while vice is being affected or being affected contrary to virtue. And virtue of
23 character as a whole happens to be found in pleasures and pains; for pleasure is either in accord with activity or because of memory or due to expectation. If it occurs in
25 activity, the cause is perception, if because of memory or expectation, it is due to the same thing; for pleasure occurs either when we remember how we were affected or when we expect to be affected in the future.

27 But then no alteration belongs to the thinking part of the soul either. For we speak of what has scientific knowledge as belonging mostly in [the category of] the
29 relative. And this is clear; for scientific knowledge does not come to be in those who have a capacity to be moved, but is due to the presence of something; for we acquire
247ᵇ20 scientific knowledge of the universal from the experience of particulars. Nor, then, is the activity [of using scientific knowledge in contemplating something] a coming to be, unless someone were to say that opening one's eyes or touching something was a coming to be; for the activity is like this. But the initial acquisition of scientific knowledge is not a coming to be or an alteration; for it is when the soul comes to a
23 rest and a settling down that someone comes to be a scientific knower and a practically wise person.

Likewise, if someone who wakes up from sleeping, sobers up from drinking, or recovers from sickness did not become a scientific knower, even though before he was not capable of using or activating his scientific knowledge, as soon as he is freed from
25 his restlessness and his thought has come to a rest and a settling down, the capacity to use his scientific knowledge belongs to him. This is the sort of thing, then, that also
27 comes about when scientific knowledge is acquired at the start, a sort of calming of the restlessness and a coming to a stop.

Children, then, are neither capable of learning nor of discerning by means of the
29 perceptual modalities as well as their elders are. For the disturbance and movement [in their souls] is great. But it settles down and comes to rest sometimes due to nature,
248ᵃ26 sometimes due to other causes. But in both cases it happens that something is altered,
27 just as happens in relation to the activity when someone wakes up or sobers up.

It is evident, then, that alteration occurs in perceptibles and in the perceptual part
248ᵇ26 of the soul, and in nothing else except coincidentally.

DE CAELO*

On the Heavens

BOOK 1

1.1
The Completeness of the Universe

It is evident that scientific knowledge about nature is, in pretty much its largest part, concerned with bodies and magnitudes, their affections and movements, and further, **268ª1**
with the starting-points, as many as there may be of this sort of substance; for of the things composed by nature, some are bodies and magnitudes, some have body and magnitude, while others are starting-points of things that have these. 5

The continuous, then, is what is divisible into things that are themselves always divisible, and a body is what is divisible in all ways. A magnitude continuous in one dimension is a line, in two dimensions a plane, in three dimensions a body. And beyond these there is no other magnitude, because the three dimensions are all the dimensions there are, and so in three ways is in all ways. For, as the Pythagoreans also 10
say, the universe and all things are defined by [the number] three, since end-point, mid-point, and starting-point have the number of the universe, and their number is the triad.[1] That is why, having taken these from nature, as if they were its laws, we make use of this number even in the worship of the gods.[2] And we assign labels too 15
in this way; for we use both of two things and both of two people, but we do not use all, but rather three is the first number with reference to which we use the latter mode of address. And in these domains, as was said, we do so because of following the lead of nature itself.

So, since all things, the universe, and the complete do not differ from each other 20
with respect to form, but rather, if indeed they do differ, it is with respect to matter and the things of which they are said, body alone among the magnitudes would be complete; for it alone is defined by [the number] three, and this is All.

Being divisible in three dimensions, body is divisible in all, while of the others, one lot is divisible in one, the other lot in two; for as it is with the number they attain, 25
so it is too with their divisibility and continuity; for one is continuous in one dimension, another in two, and this sort in all. All magnitudes, then, that are divisible are

* Translated by C. D. C. Reeve. Text: P. Moraux, *Aristote: Du Ciel* (Paris, 1965).

1. *Met.* 985ᵇ23–986ª3.

2. A number of cult actions in Greek religion had to be repeated three times.

also continuous. But whether all that are continuous are also divisible is not yet clear on the basis of the present considerations.

One thing, however, is clear: it is not possible to transition to another kind of magnitude, as we transition from length to surface, and to body from surface; for magnitude of this sort would no longer be complete; for it is necessary that the end of the transition comes about in accord with a deficiency. But what is complete cannot be defective; for it is [complete] in all ways.

Bodies, then, that are in the form of parts are each, according to this account, complete this sort [of complete]; for each has all the dimensions. But each one is determined by contact with what is neighboring. That is why each of the bodies is in a way many. But the universe, of which these are parts, is necessarily complete, and, as its name signifies, in all ways, not in one way so and in another not.

1.2
Primary Body (Ether)

As regards the nature of the universe, whether it is unlimited in magnitude or its total mass is limited must be investigated later.[3] Now, though, we will speak about the parts of it with respect to form, having made the following our starting-point:

For we say that all natural bodies and magnitudes are intrinsically capable of moving with respect to place; for nature, we say,[4] is the starting-point of movement for them. All movement with respect to place—which we call "spatial movement"—is either rectilinear or circular or a mixture of these; for these two are the only simple movements. And the cause of this is that these magnitudes are also the only simple ones: the straight line and the circumference. Circular movement is movement around the center, rectilinear is movement up and down. By "up" I mean the one away from the center, by "down," the one toward the center. So it is necessary for all simple spatial movement to be away from the center, toward the center, or around the center. And this seems to follow in accord with the account at the start;[5] for both body and its movement found completion in [the number] three.

Since of bodies some are simple and others composed of these (by "simple" I mean those that have their starting-point of movement in accord with nature—for example, fire and earth, the various forms of these, and things of the same kind as these), it is necessary that their movements too are in some cases simple and in others some sort of mixture—simple in the case of the simple bodies, mixed in the case of the composite ones, but in their case movement is in accord with the predominant component.

3. 1.5–7.
4. *Ph.* 192ᵇ20–23.
5. 268ª6–ᵇ10.

If indeed, then, there is simple movement, and circular movement is simple, and the movement of a simple body is simple movement, and simple movement is movement of a simple body (for if the body is composite, its movement will be in accord with the predominant component), it is necessary for there to be some simple body that, in accord with its own nature, naturally moves spatially in a circle; for by force it is possible for its movement to be that of another, distinct body, but in accord with nature it is impossible, if indeed the movement in accord with nature of each of the simple bodies is a single one.

Further, if movement contrary to nature is contrary to movement in accord with nature, and if one thing has one contrary, then, it is necessary, since circular movement is simple, if it is not going to be in accord with the nature of the spatially moving body, that it is contrary to its nature. If, then, fire or something else of this sort is the thing spatially moving in a circle, its spatial movement in accord with nature will be contrary to the circular. But one thing has one contrary, and spatial movements up and spatial movements down are contrary to each other. If, on the other hand, it is some distinct body that is the one spatially moving in a circle contrary to nature, there will be some other movement for it that is in accord with nature. But this is impossible; for if it is the spatial movement up, the body will be fire or air, and if it is down, water or earth.

But then too it is necessary for the spatial movement in question to be primary. For the complete is prior in nature to the incomplete, and the circle is one of the complete things, while no straight line is; for an unlimited one is not complete (for [to be complete (*teleion*)] it would have to have a limit, that is, an end (*telos*)) and neither is any of the limited ones (for all limited ones have something outside them; for any of them can be extended). So if indeed the movement that is prior is that of a body that is prior in nature, and circular movement is prior to rectilinear, and rectilinear movement is movement of the simple bodies (for example, fire spatially moves in a straight line upward and earthen bodies in a straight line toward the center), it is necessary for circular movement to be the movement of some simple body too; for the spatial movement of mixed bodies, we have said,[6] is in accord with the simple body that is the predominant one in the mixture.

On the basis of these considerations, then, it is evident that there is some natural corporeal substance beyond the ones composed here, more divine and prior to all these. And further, if one were to assume that all movement is either in accord with nature or contrary to nature, and that what is contrary to nature for one thing is in accord with nature for another thing (for example, as is the case with upward and downward movements, which are contrary to nature and in accord with nature for earth and fire, respectively), it would necessarily follow that circular movement too, since it is contrary to nature for these, is in accord with nature for something else. **$269^{b}1$**

6. $269^{a}1–2$.

In addition, if circular spatial movement is in accord with nature for anything, it would clearly be some simple and primary body which in accord with nature spatially moves naturally in a circle, as fire does upward and earth downward. If, on the other hand, the things that spatially move in a circle perform the all-around spatial movement contrary to nature, it would be a wondrous and altogether unreasonable thing for this movement alone to be continuous and eternal, though it is contrary to nature; for it is evident in other cases that what is contrary to nature passes away fastest. So if indeed the thing spatially moving [in a circle] is fire, as some people say,[7] this movement will be no less contrary to nature for it than movement downward; for we see that the movement of fire is the rectilinear one away from the center.

This is why a person who makes his deductions on the basis of all these considerations would be persuaded that there is some body beyond the ones around us here, separate from them, and having a nature that is more estimable to the extent that it stands further off from those here.

1.3
Primary Body Is Exempt from Alteration and Passing Away

Since some of the things that have been said are being assumed while others have been demonstrated, it is evident that not all body has lightness or heaviness. But we must set down what we mean by "the heavy" and "the light"—now in a way that is sufficient for our present needs, though later in a more exact one,[8] when we investigate their substance. Let heavy, then, be what naturally moves spatially toward the center, light, away from the center; heaviest, what sinks below all the downward-moving bodies, lightest, what rises above all the upward-moving ones.

It is necessary, then, for everything that moves spatially down or up to have lightness, heaviness, or both—though not in relation to the same thing; for things are heavy and light in relation to each other—for example, air is light in relation to water, while water is so in relation to earth. But the body that spatially moves in a circle cannot possibly have heaviness or lightness; for neither in accord with nature nor contrary to nature does it admit of moving toward the center or away from the center. For in accord with nature, rectilinear spatial movement does not pertain to it; for the movement of each of the simple bodies is, as we saw,[9] one movement, so that the body that spatially moves in a circle will be the same as one of the bodies spatially moving in this way. On the other hand, if it is moved contrary to nature, then if downward movement is contrary to nature, upward will be in accord with nature, and if upward is contrary to nature, downward will be in accord with nature; for we

7. Thales A17a DK; Anaximander A21; Anaximenes A7, A12; Heraclitus B30; Parmenides B12; Anaxagoras A84; Plato, *Timaeus* 40a, *Epinomis* 982a–b.
8. 4.1–4.
9. 269ᵃ8–9.

posited[10] that, of contrary movements, if for something one movement is contrary to nature, the other is in accord with nature.

Since, however, the whole [body] and the part—for example, all of earth and a small clod—spatially move in accord with nature to the same place, it follows, first, that the body [that spatially moves in a circle] has neither lightness nor heaviness (for otherwise it would be capable of spatially moving either toward the center or away from the center in accord with its own nature). Next, it follows that it cannot be moved with respect to place by being hauled either up or down; for it does not admit of moving, either in accord with nature or contrary to nature, with a movement other than its own, either itself or any of its parts; for the same argument applies to whole and part.

It is equally reasonable to suppose about this body that it is incapable of coming to be and passing away, incapable of increase, and incapable of alteration, because everything that comes to be comes to be from its contrary and from an underlying subject, and passes away similarly—from an underlying subject, because of a contrary, and to a contrary, as was said in our first accounts.[11] And the spatial movements of contraries are also contrary. If, then, this body can have no contrary, because there cannot in fact be a movement contrary to spatial movement in a circle, nature seems to have correctly removed from among the contraries the body that was going to be incapable of coming to be and passing away. For coming to be and passing away happen in the realm of contraries.

But then too everything that increases, increases because of something of the same kind being added to it and dissolving into its matter. But there is none from which this body has come to be.

But if it is not capable of either increase or passing away, the same thinking leads us to suppose that it is not capable of alteration either. For alteration is movement with respect to quality, and qualitative states and dispositions—for example, health and disease—do not come about without change with respect to the affections. But as it regards all natural bodies that change with respect to an affection, we see them to be subject both to increase and decrease—for example, the bodies of animals and plants and their parts, and also those of the elements. So if indeed the body in circular movement does not admit of either increase or decrease, it is reasonable for it to be incapable of alteration as well.

Why, then, the primary body is eternal and not subject to increase or decrease, but rather incapable of aging, incapable of alteration, and unaffectable, is—provided our assumptions are convincing—evident from what has been said. **$270^{b}1$**

It seems too that the argument attests to the things that appear to be so, and the things that appear to be so attest to the argument; for all human beings have a supposition about the gods, and all—both barbarians and Greeks, as many as acknowledge

10. $269^{a}32–34$.
11. *Ph.* 1.7–9.

gods at all—assign the highest place to the gods, on the assumption, clearly, that immortal is closely linked with immortal; for any other way is impossible. If indeed, then, there is something divine, as indeed there is, the things just now said about the substance that is primary among the bodies were correctly said.

But this result also follows sufficiently enough through perception, at any rate for (one might almost say) merely human conviction; for in all of past time, according to the record people have handed down one to another, nothing appears to have changed either in the whole of the outermost heaven[12] or in any of the parts proper to it.

And it seems that the name too has been handed down even to the present time by the ancients, who conceived of it in the very way we ourselves speak of it; for one must acknowledge that the same beliefs return to us not once or twice but an unlimited number of times.[13] That is why, on the supposition that the primary body is something distinct, beyond earth, fire, air, and water, they gave the name *aithêr* ("ether") to the uppermost place, positing a name for it from the fact that, throughout eternal time, it is running always (*thein aei*). Anaxagoras, on the other hand, does not use this name correctly; for he uses *aithêr* in place of [what he should call] "fire."[14]

It is also evident from what has been said why the number of what are called "simple bodies" cannot be greater; for it is necessary for the movement of a simple body to be simple, and we say that the following are the only simple movements: circular and rectilinear, and the two parts of the latter, the one away from the center, the other toward the center.

1.4
Circular Movement Has No Contrary

That there is no other spatial movement contrary to spatial movement in a circle is a conviction one may obtain from many sources.

First, one assumes the straight line to be opposed above all to the circumference; for concave and convex seem to be opposed not only to each other but also, when they are coupled and taken as a composite, to the straight line.[15] So if indeed there is a contrary movement, it is above all necessary for what is contrary to movement in a circle to be rectilinear movement. But rectilinear movements are opposed to each other because of their places; for up-down is at once a difference of place and a contrariety.

12. The outermost (or, looking inward, the first) heaven is the sphere of the fixed stars.
13. *Mete.* 339ᵇ27–30, *Met.* 1074ᵃ38–ᵇ14.
14. B2 DK.
15. Begin with two equal semicircles, S_1 and S_2. Nest S_1 inside S_2. Notice that the "concave" S_1 and the "convex" S_2, which seem to be opposed, have now been joined together. But both clearly stand opposed to their common straight diameter. And that opposition remains when S_1 is flipped 180° along that diameter, so as to form the circumference of a circle with S_2.

Next, if someone supposes that the very same argument that applies to rectilinear applies also to spatial movement along a circumference—for example, that spatial movement from A to B is contrary to that from B to A [Fig.1]—

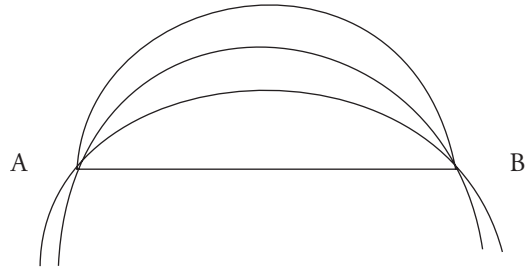

Fig. 1

it is [in fact] the rectilinear he is speaking of; for it is limited, but there would be an unlimited number of circumferential lines through the same points.

It is the same too in the case of one of the two semicircles—for example, from C to D and from D to C [Fig. 2];

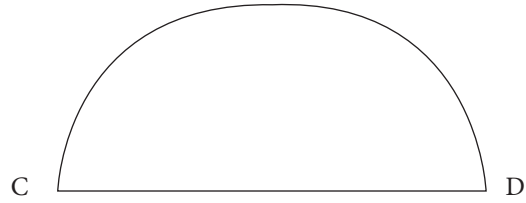

Fig. 2

for it [the spatial movement] is the same as along the diameter, since we always suppose the distance between each pair of points to be a straight line.

And it is the same even if one constructed a circle and posited that the spatial movement along one semicircle was contrary to that along the other—for example, that along the whole circle, the spatial movement along semicircle G from E to F is contrary to that along semicircle H from F to E [Fig. 3].[16]

16. When the semicircles G and H are separate, the spatial movement from E to F is distinct from the one from F to E, because they are to and from distinct places, and so are distinct for the same reason that the corresponding rectilinear ones would be. But when the semicircles are joined (as in Fig. 4), E and F are both starting-point and end-point of the same spatial movement. The Bekker text of the following paragraphs is reorganized as indicated.

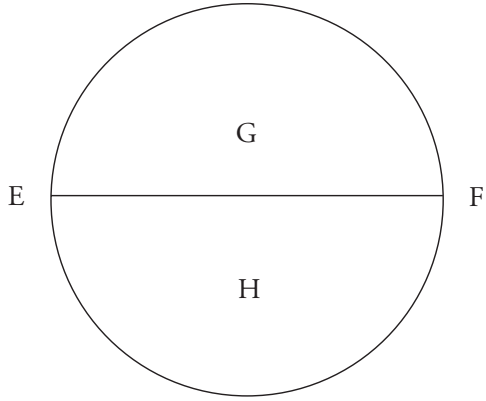

Fig. 3

Even if these were contraries, however, it in no way follows that the spatial move-
23 ments along the whole circle are contraries. For they will be on the same circular path, because it is necessary for what spatially moves in a circle, wherever it starts
25 from, to return to all the contrary places alike (the contrarieties of place are up and down, front and back, right and left), and the contrarieties of spatial movement are
28 in accord with the contrarieties of place.

19 But then neither is spatial movement in a circle from A to B contrary to that from A to C [Fig. 4];

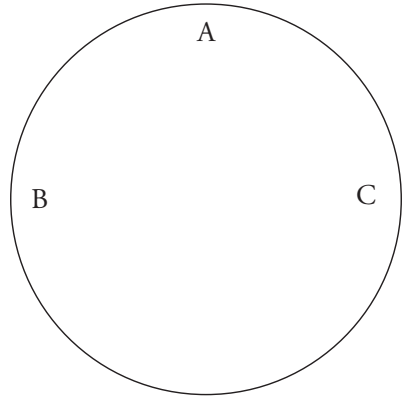

Fig. 4

for the movement is from the same and to the same, but a contrary spatial movement was defined as from a contrary to a contrary.[17]

And even if spatial movement in a circle were contrary to spatial movement in a circle, one or the other would be pointless. For if they were equal, there would be no movement of them, while if one of the movements did the mastering, the other would not exist. So if there were two bodies, one of the two, in not moving with its own movement, would be pointless; for we say that a shoe is pointless if it is not being worn as a shoe. The god and nature, however, make nothing pointlessly.

1.5
Primary Body Is Not Unlimited

But since we are now clear about these matters, we must investigate the remaining ones, and first whether there is an unlimited body, as most of the ancient philosophers thought,[18] or whether this is an impossibility; for its being the former way or the latter way makes no small difference—but rather absolutely all the difference—as regards getting a theoretical grasp on the truth; for this has been and is the starting-point of pretty much every disagreement among those who have made some pronouncement about nature as a whole, if indeed even a small initial deviation from the truth later on multiplies itself ten thousand times. For example, if someone said there is a smallest magnitude, this person, by having introduced the smallest one, would have upset the greatest things in mathematics. The cause of this is that the starting-point is greater in capacity than in magnitude, which is why what is small at the start becomes immensely great at the end. But the unlimited has both the capacity of a starting-point and, in quantity, the greatest one. So there is nothing absurd or unreasonable in the fact that the difference that stems from the assumption that there is an unlimited body is a wondrous one. That is why we must speak about it, taking it up from the start.

It is necessary, then, for every body to be either simple or composite, so that the unlimited one too will be either simple or composite. But it is also clear, surely, that if the simple ones are limited, it is also necessary for the composite one to be limited; for what is composed of things that are limited in both number and magnitude is limited in both number and magnitude; for it is as great as what it is composed of.

It remains, therefore, to see whether any of the simple bodies can be unlimited in magnitude, or whether this is impossible. When we have discussed the primary one among the bodies, then, let us investigate the remaining ones in the same way.

That it is necessary for the body that spatially moves in a circle to be limited in its entirety is clear from the following:

17. Even though B and C have distinct labels, spatial movements in the same circle all have the same starting-points and end-points, and so cannot be contraries.

18. Anaximander A11, B2 DK; Anaximenes A7; Anaxagoras B1, B2; Melissus B3; Democritus A37.

For if the body moving spatially in a circle is unlimited, the radii produced from the center will be unlimited. But the interval between unlimited radii is unlimited—
30 by an "interval between lines" I mean that outside of which no magnitude in contact with the lines can be found. It is necessary, then, for this interval to be unlimited; for the interval between limited lines will always be limited. Further, it is always possible
272ᵃ1 to take [an interval] greater than [any] given one, so that just as we say that number is unlimited, because there is not a greatest, the same argument also applies to the interval. If, then, it is not possible to traverse the unlimited, and if, of an unlimited body, it is necessary for the intervals to be unlimited, it could not possibly be moving
5 in a circle. But we see the heaven revolving in a circle, and we have also determined by argument that movement in a circle belongs to a certain thing.

Further, if you subtract a limited time from a limited time, it is necessary for the remainder to be limited as well and to have a starting-point. But if the travel time has a starting-point, there is also a starting-point of the movement, and so of the
10 magnitude that has been traveled. And the same applies to the other cases too.

Let, then, the line ACE be unlimited in one direction, E, and the line BB be unlimited in both directions [Fig.5].

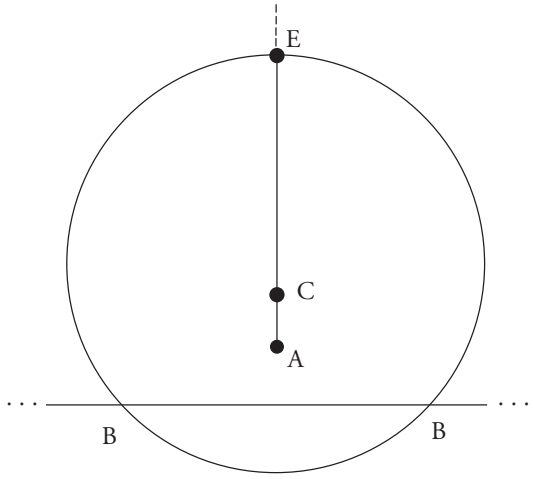

Fig. 5

If, then, the line ACE inscribed a circle with C as its center, ACE will at some time spa-
15 tially move in a circle while cutting BB for a limited time; for the entire time in which the heaven spatially moved in a circle is limited. Therefore, the time subtracted from this, in which it was doing the cutting, is limited as well. Therefore, there will be a starting-point at which ACE first cuts BB. But this is impossible. Therefore, it is not possible for the
20 unlimited to revolve in a circle. So neither could the cosmos,[19] if it were unlimited.

19. I.e., the primary (or outermost) heaven.

Further, it is also evident from the following considerations that it is impossible for the unlimited to move. For let the limited line A be spatially moving past the limited line B. It is necessary, then, for A to get clear of B, at the same time as B gets clear of A; for the extent to which one overlaps the other is the same as that to which the other overlaps the one. If, then, both were moving in contrary directions, they would get clear of each other faster, while if one were spatially moving past one remaining at rest, they would do so more slowly, provided the one spatially moving past the other is moving at the same speed.

But this at least is evident, that it is impossible to traverse an unlimited line in a limited time. Therefore, it must be in an unlimited one. This was proved previously in the discussions concerning movement.[20] And it makes no difference at all whether the limited line is spatially moving past the unlimited one, or the unlimited one past it; for whenever the one passes the other, the other passes the one, whether it is moving or unmoving, except that they will get clear of each other faster if both are moving. And yet sometimes there is nothing to prevent a moving line from passing one at rest faster than one moving in a contrary direction, if one has made both the lines moving spatially in contrary directions move slowly, but the one passing the one at rest moves spatially much faster than them.

272^{b}**1**

It is no impediment to the argument, then, that one line is moving past a line that is at rest, since it is possible for a moving A to pass a moving B more slowly [than if it were immobile]. If, then, the time in which a limited moving line gets clear [of an unlimited one] is unlimited, it is necessary for the time in which an unlimited one moves past a limited one to also be unlimited. It is impossible, therefore, for the unlimited to move as a whole; for if it moves even the smallest distance, it is necessary for it to do so in an unlimited time. But then the heaven as a whole does go around and revolve in a circle in a limited time, so it goes around any line within it—for example, the limited line AB[21] [Fig. 6]:

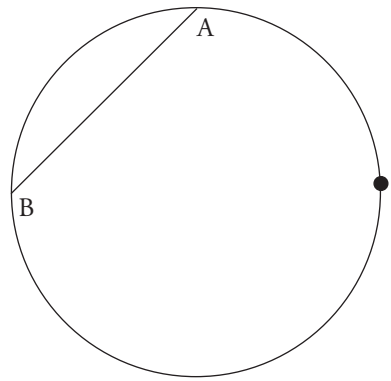

Fig. 6

20. *Ph*. 5, 6, and 8.
21. Either the chord AB or the corresponding arc.

It is impossible, therefore, for the body moving in a circle to be unlimited.

Further, just as a line, insofar as it is a limit, cannot possibly be unlimited (or rather, if indeed it is, it is in length), a plane too, insofar as it is a limit, cannot be unlimited, and, if it is a definite one, it cannot be unlimited in any way—for example, a square, a circle, or a sphere cannot be unlimited, any more than a foot-long line can be. If, then, neither a sphere nor a circle can be unlimited, and if there were no circle, there would be no spatial movement in a circle, and similarly if there were no unlimited circle, there would be no unlimited spatial movement in a circle, then if there were no unlimited circle, there would be no unlimited body moving in a circle either.

Further, if C is the center, the line AB is unlimited, E is an unlimited line at right angles to it, and CD a moving line, CD will never get clear of E, but will always be in a situation like that of CE, since it cuts E at F [Fig. 7].

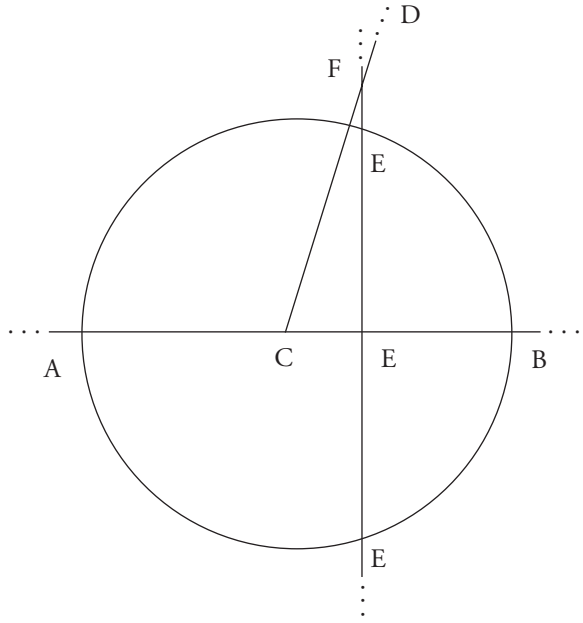

Fig. 7

The unlimited line, therefore, will not go around the circle.

Further, if the heaven is unlimited, and moves in a circle, it will have traversed the unlimited in a limited time. For let the heaven when remaining at rest be unlimited, and another heaven moving within it be of equal magnitude.[22] So if the latter, being unlimited, has indeed gone around in a circle, it has traversed an unlimited equal to itself in a limited time. But this, we saw,[23] is impossible.

22. Assuming that one unlimited body can fit exactly inside another, with the one at rest being what the other is moving relative to.
23. *Ph*. 6.7.

One can also state it conversely, that if the time in which it has revolved is limited, **273a1**
it is necessary for the magnitude traversed to also be limited. But it has traversed a magnitude equal to itself. Therefore, it too is limited.

That, then, the body moving in a circle is neither unending nor unlimited, but 5
has an end, is evident.

1.6
No Element Is Unlimited

Moreover, neither what spatially moves toward the center nor what moves away from the center will be unlimited:

For spatial movements upward and downward are contraries, and contrary ones are to contrary places. And if one of two contraries is definite, the other will be definite too. But the center is definite; for wherever the body that sinks down spa- 10
tially moves from, it cannot go further than the center. Since, then, the center is definite, the upper place must also be definite. But if the places are definite, that is to say, limited, the bodies will also be limited. Further, if up and down are definite, it is necessary for what is intermediate to be definite too. For if it is not definite, 15
movement would be unlimited. But that this is impossible was proved previously.[24] Therefore, the center is definite, so that a body that is in it, or that can come to be in it, is definite as well. Moreover, the bodies spatially moving upward or downward can come to be in it; for the one naturally moves away from the center, the other toward 20
the center. From these considerations, then, it is evident that there cannot possibly be an unlimited body.

Also, in addition to these, if there is no unlimited heaviness, none of these bodies could be unlimited either; for it is necessary for the heaviness of an unlimited body to be unlimited too. (The same argument will also apply in the case of lightness; for if there is an unlimited heaviness, there will be unlimited lightness as well, if what rises 25
above is unlimited.) This is clear from the following:

For let heaviness be limited, and take an unlimited body AB, of weight C. Then, let the limited magnitude BD be subtracted from the unlimited body, and let its weight be E. E will then be smaller than C; for the weight of the smaller magnitude 30
will be smaller. Let the smaller, then, taken as many times as you like, measure out the greater, and, as the smaller weight is to the greater, let BD be to BF; for it **273b1**
is possible to subtract as much as one likes from the unlimited. Therefore, if the magnitudes are proportional to the weights, and the smaller weight is of the smaller magnitude, the greater would also be of the greater one. Therefore, the weight of the limited one and of the unlimited one will be equal. 5

24. 272a21–b17.

Further, if the greater weight is of the greater body, the weight of GB[25] will be greater than that of FB, so that the weight of the limited will be greater than that of the unlimited. Or the weight of unequal magnitudes will be the same; for the unlimited is unequal to the limited.

And it makes no difference whether the weights are commensurable or incommensurable; for the same argument will apply even if they are incommensurable—for example, if E, taken three times in measuring C, exceeds it; for three times the whole weight of the three magnitudes BD[26] will then be greater than that of C. So there will be the same impossibility.

Further, we can however assume them to be commensurable; for it makes no difference whether one starts from the weight or from the magnitude—for example, if weight E is taken to be commensurable with C, and a magnitude, BD, of weight E is subtracted from the unlimited, then as weight is to weight, BD will be to some other magnitude, BF; for if the magnitude is unlimited, it is possible to subtract as much as one likes; for if this is so, both the magnitudes and the weights of the things will be commensurable with each other.

Nor indeed will it make any difference to the demonstration whether the magnitude has its weight uniformly or non-uniformly distributed; for it is always possible to take bodies of equal weight to BD, subtracting from the unlimited or adding whatever one wishes.

So it is clear from what has been said that the weight of an unlimited body will not be limited. Therefore, it is unlimited. If, then, this is impossible, it is also impossible for there to be any unlimited body.

But that it is impossible for there to be any unlimited weight is evident from the following. For if a certain weight moves a certain distance in a certain time, a yet greater one will move the same distance in a shorter time, and the proportion the weights have, the times will have in reverse—for example, if half the weight moves in
274ᵃ1 a certain time, twice the weight will do so in half the time. Further, a limited weight will traverse any limited distance in a certain limited time. Therefore, it is necessary on the basis of this that if there is an unlimited weight, it must on the one hand move (insofar as it is as great as a limited one plus yet more), but on the other hand not move (insofar as it must move in proportion to the excess, though in the reverse way: the greater weight in the shorter time).—But there is no ratio of the unlimited to the limited, while there is one of the shorter time to the greater limited time. But perhaps [as the weight increases, it moves] in an ever shorter time. But there is no shortest time. Nor, if there were, would it be of any benefit; for some other greater limited weight could have been taken in the same ratio in which the unlimited one stood to

25. A limited sub-part of the unlimited body greater than FB (previously, BF), which is unlimited.

26. BD serves as a unit E for measuring weight.

the other. So the unlimited weight would move the same distance in the same time as the limited one. But this is impossible.

Moreover, it is surely necessary, if indeed an unlimited weight can move in any limited time, for there to be another limited weight that will move a certain limited distance in the same time.

It is impossible, therefore, for there to be an unlimited heaviness, and similarly there cannot be unlimited lightness either. Therefore, bodies having unlimited heaviness or lightness are also impossible.

1.7
No Body Is Unlimited

That there can be no unlimited body is clear through getting a theoretical grasp on the particular [simple bodies] in the foregoing way, and by a universal investigation not only in accord with the arguments in our discussions concerning the starting-points[27] (for there we previously determined in universal terms in what way the unlimited exists and in what way it does not exist), but now also in another way. After this we must investigate whether, even if the body of the universe is not unlimited, it may nonetheless be enough for there to be several heavens; for perhaps someone might be puzzled about whether there is anything to prevent there being others, more than one, composed just like the cosmos around us, though of course not an unlimited number. First, though, let us speak in universal terms about the unlimited.

It is necessary, then, for every body to be either unlimited or limited, and if unlimited, either entirely uniform or non-uniform, and if non-uniform, either composed of a limited number of forms or of an unlimited number. That it cannot then be composed of an unlimited number is clear, if one will allow our first assumptions to stand. For since the primary movements are limited, it is necessary for the forms of the simple bodies to also be limited. For the movement of a simple body is simple, and the simple movements are limited in number, and it is necessary for every natural body to have movement.

On the other hand, if indeed the unlimited is to be composed of a limited number [of forms], it is necessary for each of the parts to be unlimited—I mean, for example, water or fire. But this is impossible; for it has been proved[28] that neither heaviness nor lightness is unlimited.

Further, it is necessary for their places to also be unlimited in magnitude, so that the movements of all of them must be unlimited as well. But this is impossible, if we are to posit that our first assumptions are true, and that what spatially moves

27. *Ph*. 3.4–8.
28. 1.6.

downward cannot possibly move without limit, nor, in accord with the same argument, can what spatially moves upward. For it is impossible for what cannot have come to be to be coming to be, alike in quality, quantity, and in place. I mean that if it is impossible for a thing to have come to be white, or a cubit long, or in Egypt, it is also impossible for it to be coming to be any of these things. Therefore, it is impossible even to spatially move toward a place where no spatially moving thing is capable of arriving.

Further, even if they are dispersed, it might nonetheless still be thought possible for what is composed of all its particles[, for example,] fire,[29] to be unlimited. But body, we saw,[30] is what has extension in all ways. So how could there possibly be several dissimilar bodies, each of which is unlimited? For each must be unlimited in all ways.

But then neither can the unlimited body be entirely uniform. For, first, there is no other [rectilinear] movement besides these. It will, then, have one of these. But if this is so, it will follow that there will be either unlimited heaviness or unlimited lightness. But then the body that spatially moves in a circle cannot be unlimited either. For it is impossible for the unlimited to spatially move in a circle; for there is no difference between saying this and saying that the heaven is unlimited, and this has been proved to be impossible.

But then it is in fact not possible for the unlimited to move at all. For it will move either in accord with nature or by force. And if by force, there will also be the movement that is in accord with nature for it, so that there will be another place of equal size toward which it will spatially move. But this is impossible.[31]

That it is impossible in general for the unlimited to be affected in any way by the limited, or to affect the limited, is evident from the following. For let A be unlimited, B limited, C the time in which it moves something or is moved. If, then, A is heated, pushed, or affected in some other way by B, or is moved in any way in the time C, let D be smaller than B, and let the smaller move a smaller in an equal time. Let E be what has been altered by D. Then, as D is to B, E will be to some limited quantity. Let, then, the equal alter an equal in an equal time, the smaller a smaller in an equal one, and the greater a greater one—the later being greater precisely in the same proportion as the greater [mover] to the smaller one. Therefore, the unlimited will not be moved by any limited thing in any time; for a smaller thing will be moved by another smaller one in an equal time, and what is proportional to it will be limited; for the unlimited stands in no ratio to the limited.

But then neither will the unlimited move the limited in any time. For let A be unlimited, B limited, and C the time in which it does so. Then D will move something smaller than B in C; let it be F. What BF as a whole is to F, then, let E stand

29. Retaining πῦρ.
30. 268a7.
31. Since if it were unlimited, it would already have occupied all of place prior to moving.

in this ratio to D. Then E will move BF in time C. Therefore, the limited and the unlimited will cause an [equal] alteration in an equal time. But this is impossible; for it was assumed that the greater does so in a shorter time. Whatever time is taken, the result will be the same, so that there will be no time in which the unlimited will move something. But then it cannot move something or be moved in an unlimited time either; for it has no limit, while affecting and being affected do.

Nor, then, can the unlimited be affected by the unlimited in any way. Let A and B be unlimited, and CD the time in which B was affected by A. Then, since the whole of B was affected, E, which is a part of the unlimited, will not be affected to the same extent in an equal time. For let it be assumed that the smaller is moved in a shorter time. Let E have been moved by A in D. Then what D is to CD, E is to some limited part of B. Therefore, it is necessary for this to be moved by A in time CD. For let it be assumed that the greater and smaller things will be affected in a longer and a shorter time by the same thing, when they are determined in proportion to the time. Therefore, there is no limited time in which the unlimited can be moved by the unlimited. Therefore, it must be in an unlimited one. But an unlimited time does not have an end, while what has been moved does have [an end of its movement].

Therefore, if every perceptible body has the capacity to affect, or be affected, or both, an unlimited body cannot be perceptible. Moreover, whatever bodies are in a place, at any rate, are also perceptible. Therefore, there is no unlimited body outside the heaven; nor yet is there one that is up to a certain limit. Therefore, there is no body at all outside the heaven. For if it is intelligible, it will be in a place; for outside and inside signify place. So it will be perceptible. But nothing perceptible is not in a place.

It is also possible to attack the issue in a more logico-linguistic way as follows. For the unlimited, when uniform, cannot move in a circle; for there is no center of the unlimited, while what moves in a circle moves around the center. But then neither can the unlimited spatially move in a straight line; for there would need to be another just as large (that is, unlimited) place that it will spatially move toward in accord with nature, and a distinct one, just as large, that it will move toward contrary to nature.

Further, whether it has its rectilinear movement by nature or by force, either way there will need to be an unlimited moving strength; for the unlimited strength is that of the unlimited and the strength of the unlimited is unlimited. So the mover will be also unlimited (there is an argument in the discussions concerning movement[32] that nothing limited has unlimited capacity and nothing unlimited has limited capacity). If, then, what can be moved in accord with nature can also be moved contrary to nature, there will be two unlimited things, the one that is a mover in this way and the one that is a moved.

Further, what is the mover of the unlimited? If it moves itself, it will be animate. But how is it possible for there to be an unlimited animal? But if the mover

32. *Ph*. 266^{a}27–^{b}27.

is something else, there will be two unlimited things, the mover and the moved, differing in shape and capacity.

If the universe is not continuous, but rather, as Leucippus and Democritus say, is divided into particles by the void, it is necessary for there to be one [sort of] movement for all things. For the particles are determined by their shapes, but, they say, their nature is a single one, as if each one were a separate piece of gold. Among these, as we say, it is necessary for there to be the same [sort of] movement; for where a single clod of earth spatially moves to, the totality of earth does as well, and both the totality of fire and a single spark spatially move to the same place. So none of these bodies will be unconditionally light if all have heaviness, while if all have lightness, none will be heavy. Further, whether they have heaviness or lightness, there will be some extremity or some center of the universe. But this is impossible if it is unlimited.

In general, where there is neither center nor extremity, and neither up nor down, there will be no place for the spatial movement of bodies. And if there is not this, there will not be movement; for it is necessary for things to move either in accord with nature or contrary to nature, and these are determined by their proper places, and by those of the others.

Further, if there is a place where a thing remains at rest or to which it spatially moves contrary to nature, it is necessary for there to be something else for which this place is in accord with nature (one may be persuaded of this on the basis of induction). It is necessary, then, that not everything have heaviness (or lightness), but rather for some to have it, and others not to have it.

That the body of the universe is not unlimited, therefore, is evident from these considerations.

1.8
There Cannot Be More Than One Heaven (1)

Let us now say why there cannot be several heavens either, for we said[33] that this must be investigated, in case someone thinks that it has not been proved universally about all bodies that it is impossible for any of them at all to exist outside the cosmos, but that the argument applies only to those with no definite position.

For all things both remain at rest and move both in accord with nature and by force, and, where they remain at rest not by force, they also spatially move to in accord with nature, and where they spatially move to [in accord with nature], they also remain at rest in [not by force]; on the other hand, where they remain at rest by force, they also spatially move to by force, and where they spatially move to by force, they also remain at rest in by force. Further, if this spatial movement is by force, its contrary is in accord with nature. If, then, earth will spatially move by force from

33. 274ᵃ24–28.

there to the center here, it will spatially move in accord with nature from here to there; and if earth from there remains at rest here not by force, it will spatially move toward here in accord with nature too. For the spatial movement that is in accord with nature is a single one.

Further, it is necessary for all the cosmoses, being admittedly similar in nature, to be composed of the same bodies. But then it is necessary for each body to have the same capacity—I mean, for example, fire and earth and the ones intermediate between them;[34] for if these are homonyms and are not said of things there in accord with the same form as of those among us, then the universe too would be said to be a cosmos homonymously. It is clear, therefore, that one of them must spatially move naturally away from the center, while another does so toward the center, if indeed all fire is the same in form as [other] fire (and also each of the others), just as the parts of fire in this cosmos are the same in form.

That this is of necessity so is evident from our hypotheses about movements; for the movements are limited, and each of the elements is said to be what it is with reference to one of the movements. So if indeed movements are in fact the same, it is necessary for the elements too to be everywhere the same.

Therefore, the parts of earth in another cosmos will be naturally such as to spatially move toward the center of this one, and fire there toward the extremity of this one. But this is impossible; for if this happens, it is necessary for earth in its own cosmos to spatially move upward, and fire toward the center. Similarly, the earth here will move in accord with nature away from the center in moving toward the center there, because of the way the cosmoses are positioned in relation to each other. For either we must not posit that the simple bodies have the same nature in the several heavens, or in saying that they do, it is necessary to make a unique center and a unique extremity. But if this is so, there cannot be more than one cosmos.

But to think that the nature of the simple bodies is then different the more or less distant they are from their proper places is unreasonable; for what difference will it make to say that they are this distant or that distant? They will differ in proportion to their increase in distance, but their form will remain the same.

Moreover, it is necessary for the simple bodies to have some movement; for that they do move is evident. Are we to say, then, that all their movements are by force, even contrary ones? But what does not naturally move at all cannot be moved by force. If, therefore, some movement in accord with nature belongs to them, it is necessary for the movement of particular ones that are the same in form to be toward a place that is one in number—for example, toward this particular center or this particular extremity. But if they are toward places that are the same in form, but many (because as particulars they are in fact many, but in form each is undifferentiated [from the others]), then there will not be such [a place] for one but not for another of the parts, but for all alike; for all are alike undifferentiated in form, although any one

34. I.e., air and water.

is distinct in number from any other. What I mean is this: if the parts here behave in a similar way both toward each other and toward the ones in another cosmos, then one taken from here will not behave differently toward the ones in another cosmos than toward those in its own, but in a similar way. So either it is necessary for these assumptions to be altered, or it is necessary for there to be a unique center and a unique extremity. But if this is so, then, by the same proofs and the same necessities, there must also be only one heaven and not several.

That there is a certain place that it is natural for earth to spatially move toward, and also one for fire, is clear from other [sorts of change]. For, in general, what moves changes from something to something, and these—the from which and the to which—differ in form. And all change is limited—for example, what becomes healthy changes from sickness to health, and what increases changes from smallness to largeness. So too for what spatially moves; for it too comes to be somewhere from somewhere. Therefore, what it naturally moves from and to must differ in form, just as what becomes healthy [does not change to] some random point, nor to whichever one the mover wishes.

Therefore, fire—and earth too—spatially moves not without limit but toward opposite points. But with respect to place up is opposed to down, so that these will be the limits of spatial movement. (Since even spatial movement in a circle has in a way opposite points, the end-points of its diameter, though to the whole movement nothing is contrary, so even for these the movement is in a certain way toward opposite and limited points.) Therefore, it is necessary for it to have some end and not spatially move without limit.

A proof of there being no spatial movement without limit is that earth, the closer it gets to the center the faster it spatially moves, while fire does so the closer it gets to the upper place. But if the spatial movement were without limit, its speed would be unlimited too, and if the speed were, so too would be the heaviness and the lightness involved; for just as[35] a thing that is lower than another is faster, another is faster because of its heaviness, so if the increase in heaviness were unlimited, the increase in speed would be unlimited as well.

277b1 But then neither could they be moved upward and downward by something else, nor by force or squeezing out, as some people say.[36] For then more fire would move more slowly upward and more earth more slowly downward. As things stand, however, the contrary always happens: more fire and more earth spatially move faster to their own place. Nor would it spatially move faster toward the end if it were by force and squeezing out; for everything spatially moves more slowly the further it gets from what did the forcing, and what it spatially moves from by force, it spatially moves to not by force. So by getting a theoretical grasp on these points it is possible to get adequately persuaded of what is being said.

35. Rejecting the addition of εἰ.
36. *DA* 404a1–16.

Further, [that there is a unique heaven] might also be proved by means of the arguments from primary philosophy, and from movement in a circle, which is necessarily eternal both here and in other cosmoses as well.[37]

It should also be clear to those who investigate in the following way that it is necessary for there to be a unique heaven. For since there are three corporeal elements, the places of the elements will also be three, one around the center for the body that sinks, another for the body that spatially moves in a circle, which is the extremity, and a third intermediate between them for the middle body. For it is necessary for what rises above to be in this one. For if it is not in this one, it will be outside. But it is impossible for it to be outside. For one is without heaviness, the other has heaviness, and the lower place is that of the body that has heaviness (if indeed the place of what is heavy is toward the center). Moreover, it could not be so, contrary to nature; for then it will be in accord with nature for another one; but there is, as we saw, no other one. Therefore, it is necessary for it to be in the intermediate place. What the differences of this place are, we will say later.[38]

Concerning the bodily elements, then, what sort they are and how many, and what the place of each is, and further, in general, how many in number the places are, is clear to us from what has been said.

1.9
There Cannot Be More Than One Heaven (2)

That not only is the heaven[39] unique, but that there cannot come to be more, and further, that it is eternal, being incapable of coming to be and of passing away, we should now state, first of all going through the puzzles about this.

For it might seem to those who investigate in the following way that there cannot be one, unique heaven; for in everything that is constituted and has come to be by nature or by craft, the shape [or form] taken intrinsically and the shape mixed together with the matter are distinct. For example, the form of the sphere and the gold or bronze sphere are distinct; and, again, the shape of the circle and a brazen or wooden circle are distinct; for in stating the essence for sphere or for circle, we do not mention bronze or gold in the account, on the supposition that these are not [parts] of its substance; while if we are speaking of the brazen or golden one, we do mention it, and we do so even when we cannot understand or grasp any other, beyond the particular one. For sometimes nothing prevents this from happening—for example, if only one circle were grasped; for the being for circle will be no less distinct from the being for this circle, and the one is the form, while the other is the form in the matter, that is, one of the particulars.

37. *Met.* 12.6–10, especially 1074ᵃ31–38.
38. 4.4.
39. Reading ἐστὶν οὐρανός.

Since, then, the heaven is perceptible, it will be one of the particulars; for everything perceptible is in matter. But if it is one of the particulars, the being for this heaven and the being for heaven unconditionally will be distinct. Therefore, this heaven and heaven unconditionally will be distinct, and the latter as being form and shape, the former as being mixed with matter. But of what there is a certain shape or form of, there either is or can come to be many particular instances. For if there are Forms, as some say,[40] it is necessary for this to result—and no less so if nothing of this sort is separable; for we see in all cases in which the substance [= essence] is in matter that things of the same form are several, indeed unlimited in number. So either there are or can be several heavens.

On the basis of these considerations, then, one might suppose either that there are or that there can be several heavens. We must go back, however, and investigate which of these is correctly stated and which not correctly.

That the account of the shape [or form] without the matter and of the one in the matter are distinct is correctly stated, and let it be true. But nonetheless there is no necessity, because of this, for there to be several cosmoses, nor even that several can come to be, if indeed this one is composed of the totality of matter, as in fact it is.

What is being said will perhaps be clearer put in the following way. For if aquilinity is curvature in a nose, or in other words, in flesh, and if flesh is matter for aquilinity, then if of the totality of flesh one [parcel of] flesh were to come to be composed, and the aquiline belonged to it, nothing else either would or could be aquiline. Similarly, if fleshes and bones are matter for what is human, if of the totality of flesh and of all the bones a human were to come to be composed in a way incapable of dissolution, it would be impossible for another human being to be. And similarly in other cases; for in general, nothing whose substance is in some underlying matter can come to be without there being some matter.

The heaven is certainly one of the particulars and one of the things composed of matter. But if it is composed not of a part of matter but of the totality of it, the being for the heaven itself and for this heaven are distinct, yet it is not the case either that there is another one or even that several could come to be, because this one includes the totality of the matter. It remains, therefore, to prove this: that the heaven is composed of the totality of natural and perceptible body.

Let us first state what we say it is to be heaven and in how many ways, in order that what we are inquiring about will become clearer to us. In one way, then, we say that the substance belonging to the outermost revolution of the universe is heaven, or the natural body that is on the outermost circumference of the universe; for more than anything else it is the last upper region that we usually call "heaven," the one in which we say that everything divine also has its seat. In another way, it is the body that is continuous with the outermost circumference of the universe, in which we find the moon, the sun, and some of the stars; for we say that these bodies too

40. I.e., Plato and his followers.

are in the heaven. Further, we say that the body that is encompassed by the outermost circumference is heaven; for we are accustomed to say that the whole and the universe is heaven. Something is said to be heaven, then, in three ways. The whole encompassed by the outermost circumference is of necessity composed of the totality of natural and perceptible body, because there neither is nor can be any body outside the heaven.

For if there is a natural body outside the outermost circumference, it is necessary for it to be either one of the simple bodies or one of the composite ones, and for it to be there either in accord with nature or contrary to nature. But it could not be one of the simple ones. For it has been proved[41] that the one that spatially moves in a circle cannot change its own place. But neither can it then be the one that moves from the center nor the one that sinks. For they could not be there in accord with nature (for other places are proper for them), while if indeed they are there contrary to nature, the place outside will be natural for some other body; for what is contrary to nature for it is of necessity in accord with nature for something else. But there is, we saw, no other body beyond these. Therefore, it is not possible for any of the simple bodies to be outside the heaven. But if none of the simple ones can be, neither can any of the mixed ones; for where the mixed one is, it is necessary for the simple ones to be as well.

Moreover, neither can a body come to be there; for it will do so either in accord with nature or contrary to nature, and it will be either simple or mixed, so that, again, the same argument will apply; for it makes no difference to investigate if it is, or if it can come to be.

It is evident, therefore, from what has been said that no corporeal mass either is or is allowed to come to be outside [the heaven]. Therefore, the total cosmos is composed of the totality of its proper matter; for its matter is natural and perceptible body. So neither are there now several heavens, nor have there been, nor can there come to be several ones. On the contrary, this heaven is one, unique, and complete.

At the same time, it is clear that there is neither place, nor void, nor time outside the heaven. For in every place body can exist; and void, they say, is that in which body does not exist, but in which it can; and time is a number of movement, and there is no movement without natural body. But it has been proved that outside the heaven there neither is nor can be body. Therefore, it is evident that there is neither place nor void, nor time outside it.

That is why things that are there are naturally such as not to be in place, nor does time age them, nor is there any change for any of the things that are stationed above the outermost spatial movement; instead, unalterable and unaffectable, having the best and most self-sufficient life, they are attaining their end throughout all eternity (*aiôn*). (For in fact this name, *aiôn*, was given utterance by the ancients in a divinely inspired way. For the end that encompasses the time of a given thing's life, outside

41. 1.2–3.

of which nothing exists in accord with nature, is called the *aiôn* ("lifetime") of it. And by the same argument, the end of the entire heaven too, that is, the end that encompasses all of time and the unlimited, is *aiôn*, immortal and divine, deriving its name from its always being (*aiei einai*).) From it too the being and life for other things derive, for some in a more exact way, for others in a more indistinct one.

And in fact, just as in the philosophical studies in circulation concerning things divine, it is often brought to light in the arguments that whatever is divine, whatever is primary and highest, is necessarily unchangeable. The fact that this is so attests to what has been said. For neither is there anything else greater that will move it (for then that thing would be more divine), nor has it any defect, nor does it lack any of the noble things proper to it. That it is moved with an unceasing movement is also reasonable; for everything ceases moving when it arrives at its proper place, but, in the case of the body that moves in a circle, the place it starts from and at which it ends are the same.

1.10
The Cosmos Is Incapable of Coming to Be or Passing Away (1)

Having determined these matters, let us say next whether [the cosmos] is incapable of coming to be or capable of coming to be, and incapable of passing away or capable of passing away, having first gone through the suppositions of others; for in the case of contrary ones the demonstrations belonging to one lot are puzzles for the contrary lot. At the same time, what we are about to say will also be more convincing to people who have previously heard the pleas of the arguments disputing them. For then we will less seem to be securing a favorable judgment by default; for in fact those who are going to judge the truth adequately must be arbitrators rather than legal opponents.

Everyone says, then, that it has come to be, but some say that having come to be it is eternal, while others say that it is capable of passing away, just like any of the other things that are put together; still others say that it is alternately sometimes in the one state and other times in the other (passing away), and it continues being like this always, as Empedocles of Acragas and Heraclitus of Ephesus say.

To state that it has come to be but is nonetheless eternal is to state impossible things. For it is reasonable that one must posit only those things that we see to hold in many or in all cases, and in this one it is the contrary that happens; for it is evident that everything that comes to be also passes away.

Further, what has no starting-point of its present state, but rather was incapable of being otherwise throughout the entirety of its previous lifetime, is also incapable of changing; for there will be some cause [of its change], and if this had obtained previously, what is incapable of being otherwise would have been capable of being otherwise.

If the cosmos were composed of things that were previously otherwise, if they were always this way and incapable of being otherwise, it would not have come to be, while, if it did come to be, it is clearly also necessary for these things to be capable of being otherwise and not always the same. So what has been composed will be dissolved and, if dissolved, was previously composed. And this either has taken place, or is capable of having taken place, an unlimited number of times. But if this is so, it will not be incapable of passing away, whether it was otherwise at some time or capable of being otherwise.

The aid with which some of those who say that the cosmos came to be but is incapable of passing away attempt to support their case is not a true one; for they say that they speak about coming to be in a similar way to those who draw geometrical diagrams, not as of something coming to be at some time, but rather for the sake of teaching, on the supposition that it makes things easier to come to know, just as the diagram does for those who see it coming to be. But the two cases, as we say, are not **$280^{a}1$** the same; for in the production of geometrical diagrams, if everything is assumed to exist at the same time, what results is the same, while in the demonstrations these people give it is not the same, but rather something impossible; for the earlier and later assumptions are contrary ones; for they say that ordered things came from disordered ones, yet things cannot be ordered and disordered at the same time. Instead, it is necessary for there to be a process of coming to be separating the two, as well as a period of time. In geometrical diagrams, by contrast, nothing is separated by time. That it is, then, impossible for it [the cosmos] to be at once eternal and have come to be is evident.

Having it be alternately composition and dissolution is doing nothing other than establishing it as eternal but changing its shape, just as if one thought that a man coming to be from a boy or a boy from a man is at one time passing away and at another is in being; for it is clear that, whenever the elements are coming together with each other, it is not any random order and composition that comes to be, but rather the same one, especially according to those who state this account, since they assign to each of the two dispositions [of the elements] a contrary cause.[42] So if the whole body, being continuous, is at one time disposed and ordered in this way and at another time in that way, and the composition of the whole is a cosmos, that is, a heaven, then the cosmos would not come to be and pass away, but its dispositions would.

And it is impossible that, having come to be, it passed away as a whole, without making a return, since it is one; for before it came to be, the composition before it always existed, and, not having come to be,[43] cannot (we say) change. If there are

42. As Empedocles makes love the cause of composition and its contrary, strife, the cause of dissolution.

43. I.e., up to the moment of its supposed beginning (279^{b}21–24).

an unlimited number [of cosmoses], however, this is more possible. Nonetheless, whether even this is impossible or possible will be clear from later considerations.[44]

Indeed, there are some people to whom it seems possible both for something that is incapable of coming to be to pass away, and for something that has come to be to remain incapable of passing away, as in the *Timaeus*;[45] for there he says that while the heaven came to be, nonetheless it will always be for the remainder of time.

In relation to these [thinkers] we have spoken about the heaven only in natural scientific terms, but when we have investigated everything in universal ones, things will be clear about this issue too.

1.11
Ways in Which Things Are Incapable of Coming to Be or Passing Away

But first of all we must distinguish the ways in which we say things are incapable of coming to be, capable of coming to be, capable of passing away, and incapable of passing away; for these are said of things in many ways, and even if this makes no difference to the argument, thought will be indefinite if one uses what is divided in many ways as undivided; for it is unclear with reference to which nature what is said applies to it.

Something is said in one way to be incapable of coming to be if it is now but previously was not, without any coming to be or change, as is the case, some people say,[46] with being in contact and being in movement; for there is not, they say, a coming to be when something is in contact [with something else] or in movement. In another way, if something can come to be, or can have come to be, but is not; for this too did not come to be, because it can come to be [but did not do so]. In another way, something is incapable of coming to be if it is wholly incapable of coming to be, so that it is at one time and is not at another. (For something is said to be incapable [of this] in two ways: because of its not being true that it could come to be; or because of its not doing so easily, quickly, or well.)

It is the same way too with capable of coming to be. Something is capable of coming to be in one way if it previously is not but later is: whether having come to be or without coming to be, it is not at one time, but is at another. In another, if it is capable [of coming to be], defining "being capable" either in terms of its being true that it can, or in terms of its doing so easily. In another, if there is a coming to be of it from not being to being, whether—because of coming to be—it already is, or is not yet, but can be.

And capable of passing away and incapable of passing away are [said of things] in like manner; for whether something that previously is, later is not, or admits of not

44. Reference unclear.
45. Perhaps 41a–b.
46. Zeno, the Atomists, and the Platonists have all been suggested as likely candidates.

being, we say it is capable of passing away, whether it is passing away and changing at some time or not. Sometimes too we say that of what (because of passing away) admits of not being that it is capable of passing away, and in yet another way, we say it of what easily passes away—what is prone to passing away, as one might say.

And the same account applies to what is incapable of passing away. For it is either what, without passing away, is at one time but is not at another—for example, contacts, because, without passing away, these are previously but later are not. Or it is what is, but is capable of not being, or what will not be at some time but now is; for you and a contact are now; nonetheless, both are capable of passing away, because there will be a time at which it is not true to say that you are, or that these things are making contact. But most strictly speaking [what is incapable of passing away] is what now is and is incapable of passing away in such a way that it now is but later is not or cannot be. Or else it is what has not yet passed away, but cannot be later on. And something is also said to be incapable of passing away when it does not pass away easily.

If these things are indeed so, in what ways we say things are capable and incapable must be investigated; for we say that something is incapable of passing away most strictly speaking because it is not capable of passing away, that is, cannot at one time be and at another not be. And what is incapable of coming to be is also said to be incapable, that is, not capable of coming to be in such a way that previously it is not and later it is—for example, [as we say] that the diameter is not capable of being commensurable.

But if indeed something is capable of moving, or of lifting a weight, we always say so with reference to the greatest one—for example, of lifting one hundred talents or walking one hundred stades (and yet it is also capable of doing the parts within it, if indeed it is capable of doing the maximum), as the capacity must be defined in relation to the end, that is, the maximum. It is necessary, then, for what is capable of the maximum to be capable of what is within it—for example, if one is capable of lifting one hundred talents, one is also capable of lifting two, and if capable of walking one hundred stades, one is also capable of walking two. Indeed, the capacity is a capacity for the maximum. And if something is incapable of doing so-and-so much, speaking with reference to a maximum, it is also incapable of greater ones—for example, if a person is not capable of walking one thousand stades, it is clear that he is also incapable of walking one thousand and one.

None of this should trouble us; for let what is capable in the strict sense be defined by the end in the sense of the maximum. For perhaps someone might object that what has been said is not necessarily so; for a person who sees a stade will not also see the magnitudes within it; on the contrary, it is rather the case that a person who is capable of seeing a point or of hearing a small sound will also perceive greater ones. But this makes no difference to the argument; for let the maximum be defined either with respect to the capacity or with respect to the thing [it is a capacity for]. For what

is being said is clear; for while the sight of the smallest thing is the maximal sight, the speed [covering] the greater distance is the maximal speed.

1.12
The Cosmos Is Incapable of Coming to Be or Passing Away (2)

Having made these determinations, what comes next must be discussed. If, then, some things are capable of being and of not being, it is necessary that there be some greatest time determined both for their being and for their not being; I mean, during which the thing at issue is capable of being and capable of not being, with respect to any category—for example, [being or not being] human, white, three cubits long, or anything else of this sort. For if there will not be a certain quantity [of time], but always a longer one than any proposed and none than which it is shorter, the thing will be capable of being for an unlimited time, and of not being for another unlimited time—but this is impossible.

Let our starting-point be the following: Impossible and false do not signify the same thing. There is an impossible and possible, a false and a true, that are based on a hypothesis (I mean, for example, it is impossible for a triangle to contain two right angles and it is impossible for the diameter to be commensurable, if these things hold). But there are also things that are possible and impossible, false and true, unconditionally. It is not the same thing, then, for something to be unconditionally false and to be unconditionally impossible. For to say, when you are not standing, that you are standing is false, but not impossible. Similarly, to say that a person playing the lyre, but not singing, is singing is false, but not impossible. But for someone to be standing and sitting at the same time, and for the diagonal to be commensurable, it is not only false, but also impossible. It is not the same thing, then, to assume something false and something impossible. And the impossible results from the impossible.

A person does of course at the same time have the capacity for sitting and for standing, because when he has the one, he also has the other—not so as to be sitting and standing at the same time, though, but rather at distinct times. But if something has a capacity for several things for an unlimited time, "at distinct times" does not apply, but rather "at the same time."

So if for an unlimited time something is capable of passing away, it would have the capacity for not being. If, then, it has it for an unlimited time, let what it is capable of doing be realized. At the same time, therefore, it will actively be and not be at the same time. A falsehood would result, then, because a falsehood was assumed. But if what was assumed was not impossible, the result would not actually be impossible. Therefore, everything that always is, is unconditionally incapable of passing away.

Similarly, it is also incapable of coming to be; for if it is capable of coming to be, it will be capable of not being at some time—for while a thing capable of passing away is one that is previously, but now is not or cannot be at some later time, a one capable of

coming to be is one that can previously not be. But there is no time in which what always is, is capable of not being, whether for an unlimited or for a limited one; for it is also capable of being in a limited time, if indeed it is in fact capable of being in an unlimited one. Therefore, one and the same thing cannot be capable of being always and of not being always. Moreover, the negation is not possible either, I mean, not always being. Therefore, it is also impossible for something to always be and to be capable of passing away. Neither, similarly, is it capable of coming to be; for of two terms, if it is impossible for the posterior one to hold [of something] without the prior one, and if it is impossible for the prior one to hold, it is also impossible for the posterior one to hold. So if what always is cannot at some time not be, it is also incapable of coming to be.

And since the negation of what is always capable of being is what is not always capable of being, while its contrary is what is always capable of not being, the negation of which is what is not always capable of not being, it is necessary for the negations of both to belong to the same thing, and that what is capable of being and of not being be intermediate between what always is and what always is not; for the negation of each will belong to it at some time, if not always. So if what not always is not will be at some time and not be at some time, clearly what is capable of not always being but is at some time will as well, so that it too will not be. Therefore, the same thing will be capable of being and of not being, and it is intermediate between the two.

The universal argument is this: Let A and B be not capable of belonging to the same thing, and let A or C and B or D belong to everything [Fig. 8].

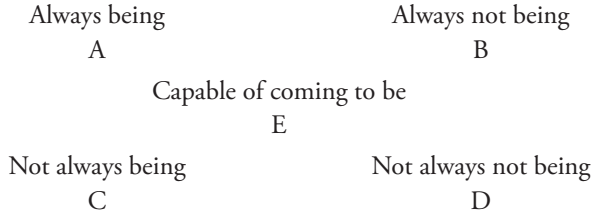

Fig. 8

It is necessary then that C and D belong to everything that is neither A nor B. Then let E be intermediate between A and B (for what is neither of two contraries is intermediate). It is necessary, then, for both C and D to belong to it. For A or C belongs to everything, so that one of them will also belong to E. Since, then, it is impossible that A belong to it, C will belong to it. The same argument also applies to D.

Neither what always is, then, nor what always is not is either capable of coming to be or capable of passing away. But it is clear too that if something is capable of coming to be or capable of passing away, it is not eternal. For it will at the same time be capable of always being and capable of not always being; but that this is impossible was proved previously.[47]

47. 281ᵇ20–25.

If, then, something is incapable of coming to be, but is, is it necessary for it to be eternal, and likewise if something is incapable of passing away, but is? (I mean incapable of coming to be and incapable of passing away strictly speaking: by "incapable of coming to be" I mean what is now and previously it was not true to say that it is not; by "incapable of passing away" I mean what is now and it will not be true to say later that it is not.)

Or, rather, if these things follow along with each other, and what is incapable of coming to be is incapable of passing away and what is incapable of passing away is incapable of coming to be, then it is necessary for eternality to follow along with each of them, and in either case, whether something is incapable of coming to be or incapable of passing away, it is eternal. This is also clear from their definition; for necessarily, in fact, if something is capable of passing away, it is capable of coming to be. For it is either incapable of coming to be or capable of coming to be. But if it is incapable of coming to be, it has been established[48] that it is incapable of passing away. And if it is capable of coming to be, then it is necessarily capable of passing away; for either it is capable of passing away or incapable of passing away. But if it is incapable of passing away, it has been established[49] that it is incapable of coming to be. If, on the other hand, incapable of passing away and incapable of coming to be do not follow along with each other, it is not necessary for either what is incapable of coming to be or what is incapable of passing away to be eternal.

But that it is necessary for them to follow along is evident from the following considerations. For capable of coming to be and capable of passing away follow along with each other. This too is clear from the previous [arguments]; for between what always is and what always is not there is an intermediate that follows along with neither of them, that is, what is capable of coming to be and capable of passing away. For it is capable of both being and of not being for a definite time (I mean of being for a quantity of time and of not being [for a quantity of time]).

If, therefore, something is capable of coming to be or capable of passing away, it is necessary for it to be intermediate. For let A be what always is, B what always is not, C what is capable of coming to be, and D what is capable of passing away [Fig. 9].

Always being A	Capable of coming to be C
Capable of passing away D	Always not being B

Fig. 9

It is necessary, then, for C to be intermediate between A and B. For there is no time in the direction of either limit in which either A was not or B was. But for what is

48. 281b25–33.
49. 281b33–282a1.

capable of coming to be, it is necessary to be either actively or potentially, and for A and B neither of them. Therefore, it [= C] will be, and again not be, for some definite quantity of time. And likewise too in the case of D. Therefore, each of the two is capable of coming to be and capable of passing away. Therefore, capable of coming to be and capable of passing away follow along with each other.

Let E be incapable of coming to be, F be capable of coming to be, G be incapable of passing away, and H be capable of passing away. As for F and H, it has been proved[50] that they follow along with each other. But whenever things are established to be related as these are, such that F and H follow along with each other, and E and F never belong to the same thing, but one or the other belongs to everything, and likewise for G and H, then it is also necessary that E and G follow along with each other. For let E not follow along with G. Therefore, F will follow along with G; for E or F belongs to everything. But then H also belongs to whatever F belongs to. Therefore, H will follow along with G. But it has been established that this is impossible. The same argument proves too that G follows along with E. **283^{a}1**

Moreover, the same relation holds between what is incapable of coming to be, E, and what is capable of coming to be, F, as between the incapable of passing away, G, and what is capable of passing away, H [Fig. 10].

Incapable of coming to be	Capable of coming to be
E	CF
Incapable of passing away	Capable of passing away
G	H

Fig. 10

To say that nothing prevents something that comes to be from being incapable of passing away, and something incapable of coming to be from having passed away, if in the one case coming to be and in the other the passing away occurs only once, is to do away with one of the things that have been granted. For all things are capable either of affecting or of being affected, of being or of not being, for either an unlimited or for some definite quantity of time (and an unlimited one [simply] because of this, because the unlimited is in a way definite, being what nothing is greater than). What is unlimited in some way, then, is neither unlimited nor definite.

Further, why at this point rather [than any other] did what previously always was pass away, or what previously always was not come to be? For if there was no reason [in favor of a certain point], and the points are unlimited [in number], it is clear that for an unlimited time something was capable of coming to be and capable of passing away. Therefore, it was capable of not being for an unlimited time. Therefore,[51] it will at the same time have a capacity for not being and for being—beforehand, if

50. 281^{b}20–25.
51. Reading ἄρ'.

it is capable of passing away, afterward, if it is capable of coming to be. So if we suppose the things it is capable of doing to be realized, contraries will belong to it at the same time.

Further, these things will belong to it alike at every point in time, so that for an unlimited time it will have a capacity for not being and for being; but it has been proved[52] that this is impossible.

Further, if the capacity belongs to it prior to its activation, it will belong to it for the entirety of time, even when it had not come to be and was not but was capable of coming to be. At the same time, then, it was not and had a capacity for being, both for being then and later on—therefore for an unlimited time.

It is also evident in another way that it is impossible for what is capable of passing away not to pass away at some time. For it will always be at the same time both capable of passing away and incapable of passing away in actuality. So at the same time it will be capable of always being and of not always being. Therefore, what is capable of passing away passes away at some time. And if it is capable of coming to be, it has come to be [at some time]; for it was capable of having come to be, and therefore of not always being.

It can also be seen in the following way that it is impossible either for what has come to be at some time to remain incapable of passing away, or for what is incapable of coming to be and previously always was to pass away. For nothing can be by chance either incapable of passing away or incapable of coming to be. For what is by chance or by luck is beyond what always or for the most part either is or comes to be. But what is for an unlimited time, whether unconditionally or from a certain point, exists either always or for the most part.

Therefore, it is necessarily by nature that things of this sort are at some times and not at others. And in things of this sort the same capacity is for what is contradictory, and the matter is the cause of their being and not being. So it is necessary for opposites to belong actively too at the same time.[53]

Moreover, it is not true to say now that something is last year, or last year that something is now. Therefore, it is impossible for what is not at some time to be eternal at a later one; for later it will also have the capacity for not being—except not one for not-being-at-the-time-when-it-is (for then actively being will belong to it), but for not being last year or in time past. Let, then, what it is a capacity for belong to it actively. It will, therefore, be true to say of it now that it is not last year. But this is impossible; for there is no capacity for having come to be, but [only] for being now or being in the future. Likewise, if previously it is eternal and later will not be; for it will have a capacity for what actively is not. So if we suppose what it is capable of to be realized, it will be true to say now that it is last year and, in general, in time past.

52. 281b20–25.
53. Reading καὶ ἅμα.

And if we investigate in a natural scientific way, and not in universal terms, it will be impossible either for something that previously eternally is to pass away later, or for what previously is not to be eternal later on. For things that are capable of coming to be and capable of passing away are all alterable as well. But they are altered by their contraries, and the things from which natural beings are composed are also the very same ones by which they are caused to pass away.

BOOK 2

2.1
Corroboration from Ancient Views

It is possible to obtain the conviction that the entire heaven has neither come to be nor is it possible for it to pass away, as some people say it is, but is one and eternal, having neither starting-point nor end-point of its entire lifetime but encompassing the infinite time within itself, on the basis of what has been said, and by means of the doctrine of those who speak otherwise by having it come to be; for if it is possible for things to be as we say, but not possible for them to be in the way described by those who say it comes to be, this should add great weight to the conviction about its being immortal and eternal. **284^{a}1**

That is why it is well to convince oneself that the ancient accounts, especially those of our forefathers, are true, that there is something immortal and divine among the things that have movement, having movement of such a sort that there is no limit to it, but rather it is the limit of the others; for the limit belongs to what encompasses, and this movement, being complete, encompasses the incomplete ones that have a limit and a cessation, while itself has neither a start nor an end, but rather is unceasing throughout unlimited time, and is the cause of the start of certain among the incomplete ones, and receives the cessation of others.

The ancients assigned the heaven, that is, the upper place, to the gods on the supposition that it alone is immortal. And the present account testifies to its being incapable of passing away and incapable of coming to be, and further, to its being unaffectable by all mortal difficulty, and, in addition to these, it is unlabored, because it needs no additional necessary force which restrains it, preventing it from spatially moving in another way that is natural to it; for everything of that sort is laborious, the more so the more eternal it is, and without a share of the best disposition.

That is why one must not suppose it to be in accord with the myth of the ancients,[54] who say that the heaven has the additional need of some Atlas for its preservation; for it seems that the people who composed this account had the same supposition as the

54. E.g., Hesiod, *Theogony* 517.

later ones; for on the supposition that all bodies have weight and are earthen, they supported the heaven in mythical fashion with an animate necessity.

One must not, then, suppose it to be this way, nor that, because of its whirling's having a spatial movement that is faster than its own balance-weight, the heaven has been preserved [from falling to the earth] for all this time, as Empedocles says.[55]

But neither is it reasonable that the heaven remains eternal because a soul necessitates it; for it is not possible for this sort of life to be painless and blessedly happy for a soul; for it necessarily, with respect to its movement,[56] involves force—if indeed it moves the primary body in another way than with its natural spatial movement, and moves it continuously—and is unleisured and deprived of all thought-involving ease, if indeed it does not possess, as does the soul of mortal animals, any of the rest that is the relaxation of the body that occurs in sleep. Instead, it is necessary that a fate of some Ixion, eternal and indefatigable, restrain it.

If, then, as we said, it is possible for the primary spatial movement to be the way we have stated, not only is it more refined to think this way about its eternity, but also this is the only way to provide harmonious accounts that are in agreement with the prophecy around and about the god. But let this be enough about these sorts of accounts for now.

2.2
Up and Down, Left and Right

Since there are some people who say that there is some right and left in the heaven, such as those called "Pythagoreans" (for this account is theirs), we must investigate whether this is the way they say it is, or rather in a distinct one, if indeed one must ascribe these starting-points to the body of the universe.

For first of all, if right and left do belong [to the heaven], one must suppose that prior starting-points belong to it in a prior way. These things have been determined in our studies on the movement of animals, because they properly belong to the nature of animals;[57] for manifestly in some animals it is evident that all parts of this sort belong (I mean, for example, right and left), in others [only] some, while in plants only up and down belong. If, however, one must ascribe something of this sort to the heaven as well, it is reasonable that the first one, as we said, that belongs in animals belongs in it too; for there are three [pairs], each of which is a starting-point of a sort. The three I mean are up and down, front and its opposite, and right and left; for it is reasonable that all these dimensions belong to complete bodies. Up is a starting-point of length, right of breadth, and front of depth. Further, [they are starting-points] in another way, in accord with movements; for I mean by "starting-points" these things

55. B35 DK.
56. Reading κατὰ τὴν κίνησιν.
57. In particular, *IA* 4–5.

from which the movements first start for the things that have them. Growth starts from the up, movement with respect to place from things right, and perception from the front; for by "front" I mean what perceptions are directed toward.

That is why one must not look for up and down, right and left, and front and back in every body, but only in those that, being animate, have a starting-point of movement within them; for in inanimate ones we do not see the starting-point from which the movement derives; for some things do not move at all, while others, though they do move, do not do so in every direction alike—for example, fire moves upward only and earth toward the center. But in things of this sort we speak of up and down and **285^{a}1** right and left with reference to ourselves; for we speak of them either with reference to our own right, as prophets do, or with reference to what is similar to our right, as with the sides of a statue, or of what has its position in the contrary way, speaking of right with reference to our left, and left with reference to our right, and of back with reference to our front. In these things themselves, on the other hand, we do not see any differences; for if they are turned around, we call their contraries "right," "left," "up," "down," "front," and "back."

That is why one might wonder at the Pythagoreans because they said that only two of these, right and left, are starting-points, but omitted the four [remaining] starting-points, which are no less controlling; for in all animals up has no less a difference in relation to down, and front in relation to back, than things right have in relation to things left. For some of these differ in capacity only, others in their shapes as well; and the up and down is present in all animate things, animals and plants alike, but right and left is not present in plants.

Further, since length is prior to breadth, if up is a starting-point of length, right of breadth, and the starting-point of what is prior is prior, up would be prior to right in coming to be, since things are said to be prior in many ways.

In addition to these, if up is where movement derives from, right what movement starts from, front what it is directed toward, in this way too up will have a certain capacity in relation to the other forms [of dimensionality].

It is just, then, to criticize the Pythagoreans because they omitted the most controlling starting-points, and because they thought that the starting-points belong alike in all things.

Since we have determined previously[58] that capacities of this sort belong in things that have a starting-point of movement, and the heaven is animate,[59] that is, has a starting-point of movement, it is clear that it also has both up and down and right and left.

For there is no need to be puzzled, because the shape of the universe is spherical, as to how there can be a right and a left of it when all its parts are similar and all the time moving. Instead, we should understand that it is as if it were a thing in which there **285^{b}1**

58. *IA* 4–5.
59. 292^{a}18–21.

is a difference between right and left, even in their shapes, around which someone has afterward placed a sphere; for it will then have the capacity corresponding to the difference, but would seem not to because of the uniformity of its shape. It is the same way with the starting-point of movement; for even if it never began moving, nonetheless it is necessary for it to have a starting-point from which it would have begun if it had begun moving, and, if it were to come to a stop, from which it would start moving again.

I mean by the "length" of it the interval between its poles, and of the poles, one is up and the other down; for only in these hemispheres do we see a difference, because of their poles not moving. At the same time, we are also accustomed to saying that the sides in the cosmos[60] are not up and down, but rather what is beside the poles, on the supposition that length is this thing [we said it is]; for what is to the side is what is beside the up or the down.

Among the poles, however, the one that appears above us is down, the one invisible to us is up. For we say that the right of a given thing is where the starting-point of its movement with respect to place derives from. And in the case of the heaven the starting-point of its revolution is where the stars rise from, so that this would be right, and where they set would be left. If, then, it starts from the right and revolves to the right,[61] it is necessary for the non-apparent pole to be up; for if it is the apparent one, the movement will be to the left, which is precisely what we say it is not. Therefore, it is clear that the non-apparent pole is up, and the people who dwell there are in the upper hemisphere and near the right-side things, while we are in the lower one and near the left-side ones, which is contrary to what the Pythagoreans say; for they put us up and in the right [part] and put the people there [in the other hemisphere] down and in the left one. But the opposite turns out to be the case.

But with respect to the second revolution, that is, the revolution of the planets, we are in the upper and in the right [parts], while those others are in the lower and in the left ones; for the starting-point of movement is the reverse for the planets because their spatial movements are contrary, so that as a result we are near the starting-point, while they are near the end-point.

About things relating to the dimensions of the parts [of the cosmos] and to their definitions with respect to place, let these be the things that are said.

2.3
Why There Are Several Spatial Movements in the Heaven

Since movement in a circle is not contrary to movement in a circle, let us investigate why there are several spatial movements—even though we have to try to make our inquiry from far away—far away not in place, but much more in virtue of the fact

60. I.e., the regions of the cosmos lying outside the poles, or at an angle to the north-south axis.

61. I.e., counterclockwise.

that we have perception of altogether few of their [intrinsic] coincidental affections. Nonetheless, let us speak about the issue.

The cause of [there being several spatial movements] must be grasped from the following. Each thing of which there is a work is for the sake of the work.[62] The activity of a god is immortality, and this is eternal living. So it is necessary that eternal movement belongs to the god. And since the heaven is such (for it is a certain divine body), because of this it has a circular body, which by nature always moves in a circle.

Why, then, is the whole body of the cosmos not like this? Because it is necessary for some part of the body spatially moving in a circle to remain at rest, the part at the center. But no part of it can remain at rest either in general or at the center. For then in fact its movement in accord with nature would be toward the center; but by nature it moves in a circle; for [otherwise] its movement would not be eternal; for nothing contrary to nature is eternal.[63] But what is contrary to nature is posterior to what is in accord with nature, and, within coming to be, what is contrary to nature is a sort of departure from what is in accord with nature. It is necessary, therefore, for there to be earth; for it rests at the center. Let this be assumed for now; later this will be proved about it.[64]

But then if there is earth, it is necessary for there to be fire as well; for if one of two contraries is by nature, it is necessary for the other—if indeed it is a contrary and has some nature—to be by nature as well; for the matter of contraries is the same; the positive is prior to the privation (I mean, for example, that hot is prior to cold); and rest and heaviness are said of things in accord with a privation of lightness and movement. But then if indeed there is fire and earth, it is necessary for there also to be the bodies intermediate between them; for each element has a contrariety in relation to each. Let this too be assumed for now; later we must try to prove it.[65]

Since these elements exist, it is evident that it is necessary for there to be coming to be, because none of them can be eternal; for contraries are affected by, and affect, each other, and are destructive of each other. Further, it is not reasonable for something movable to be eternal, whose movement in accord with nature does not admit of being eternal. But of these there is [such] movement. That it is, therefore, necessary for there to be coming to be is clear from these considerations. **$286^{b}1$**

But if there is coming to be, it is also necessary for there to be another spatial movement, either one or many; for with respect to the spatial movement of the whole, the elements of the bodies necessarily relate to each other in the same way. We will speak more perspicuously about this in what follows.[66]

62. *Met.* $1050^{a}21–22$.
63. $269^{b}6–10$.
64. 2.14.
65. 4.4, *GC* 2.3–4.
66. The reference is probably to *GC* 2.10.

For now, though, this much is clear: due to what cause the circular bodies are many, namely, because it is necessary for there to be coming to be; and there is coming to be if indeed there is fire; and there is fire and the other elements if indeed there is earth; and there is earth because it is necessary for there to be something that always remains at rest if indeed it is necessary that there be something that is always in movement.

2.4
Why the Shape of the Heaven Must Be Spherical

It is necessary for the heaven to have a spherical shape; for this most properly belongs to its substance and is by nature primary.

Let us speak in universal terms about shapes, about what sort is primary, both among plane figures and among solids. Every plane figure, of course, is either rectilinear or curvilinear. And the rectilinear is encompassed by several lines, the curvilinear by one line. Since in each kind, the one is prior by nature to the many, and the simple to the compound, the circle would be the primary plane figure.

Further, if indeed the complete is that outside which no part of it can possibly be found, as it was previously defined, and it is always possible to add to the straight line, but never to that of the circle, it is evident that the one encompassing the circle will be complete. So if the complete is prior to the incomplete, because of this too the circle would be primary among the shapes.

Similarly, the sphere is primary among the solids; for it alone is encompassed by one surface, while rectilinear solids are encompassed by several; for as the circle stands among plane figures, so the sphere stands among solids.

Further, even those[67] who divide bodies into plane figures and generate them from plane figures are apparently witnesses to this; for the sphere is the only solid that they do not divide, because of its not having more than one surface; for the division into plane figures is not as someone cutting something into parts would divide the whole, but rather into things that are distinct in form.

That the sphere is primary among the solids, then, is clear. And it is also most reasonable for those[68] who assign [the shapes] a numerical order to do so by assigning [the number] one to the circle, two to the triangle (since it has [interior angles equal to] two right angles). But if one is assigned to the triangle, the circle will no longer be a shape.

Since the primary shape belongs to the primary body, and the primary body is the body in the outermost revolution, the body that spatially revolves in a circle will be spherical. So too, therefore, is the body continuous with it; for what is

67. E.g., Plato, *Timaeus* 53c–56c.
68. Reference unclear.

continuous with something spherical is spherical. And it is the same way with what is at the center of these spheres; for it is necessary for the things circumscribed by things spherical, and in contact with them as wholes, to be spherical. But the things below the sphere of the planets are in contact with the sphere above them. So all of them would be spherical;[69] for everything is in contact and continuous with the spheres.

Further, since the universe appears and is assumed to revolve in a circle, and it has been proved[70] that there is neither void nor place outside the outermost revolution, it is also necessary, because of these things, for it to be spherical. For if it is rectilinear,[71] the result will be that there is space, body, and void outside it. For something rectilinear, turning in a circle, will never occupy the same space, but rather where previously there was body, now there will not be, and where now there is not, there will be one again, because of the changing position of the angles.

Similarly, even if it were to be some other shape not having equal lines from the center—for example, lentil-shaped or ovoid; for in all instances it would result that there is place and void outside its spatial movement, because the whole does not occupy the same space.

Further, if the spatial movement of the heaven is the measure of movements because only it is continuous, regular, and eternal, and what is least in each thing is its measure, and if the fastest movement is the least, it is clear that the movement of the heaven would be the fastest of all movements. Moreover, the line of the circle is the least line from a point to itself,[72] and the fastest movement is that along the shortest line. So if the heaven spatially moves in a circle and moves fastest, it is necessary for it to be spherical.

But it is also possible to obtain this conviction from the bodies situated around the center. For if water surrounds earth, air water, and fire air, the upper bodies will also be in the same ratio (for though they are not continuous with them, they are in contact with them). But the surface of the water is spherical, and what is **$287^{b}1$** continuous with what is spherical, or is situated surrounding what is spherical, is necessarily so itself. So it would also be evident from this that the heaven is spherical.

But then that the surface of the water is like this is evident to those who take it as an assumption that water is naturally such as always to flow into what is more hollow. And what is more hollow is what is closer to the center. Let, then, the lines AB and AC be drawn from the center, and let them be joined by the line BC [Fig. 11]:

69. Reading ὥστε σφαιροειδῆ ἂν εἴη πάντα.
70. $279^{a}11–18$.
71. I.e., a polyhedron.
72. Reading ἀπὸ τοῦ αὐτοῦ ἐπὶ τὸ αὐτὸ.

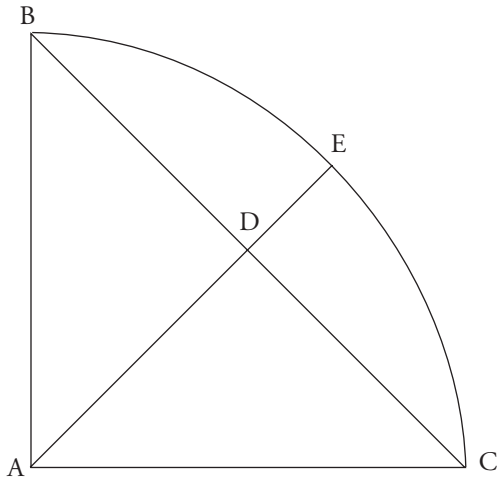

Fig. 11

The line AD drawn from the base is less than the ones from the center [AB and AC]. Therefore, the place is more hollow. So let water flow around until it is equalized. But AE is equal to those from the center [AB and AC]. So it is necessary for the water to reach [the ends of] the lines from the center [B, E, and C]; for then it will rest. But the line in contact with [the ends of] those from the center is the circumference. Therefore, the surface BEC of the water is spherical.

That the cosmos is spherical, then, is clear from these considerations, and that it is rounded so exactly that nothing artificial, nor anything else that appears within sight of our eyes, comes close to it. For none of the things from which it gets its composition is capable of receiving a regularity and exactness in the way that the nature of the all-around body is; for it is clear that they have a proportionality: as water is to earth, so it always is too with the more distant of the co-ordinate ones.

2.5
Why the Primary Heaven Revolves in One Direction Rather Than the Other

There are two ways of moving in a circle—for example, from A to B and from A to C; that these movements are not contraries was said previously.[73] But if nothing that is by luck or by chance can possibly be among the eternal things, and the heaven is

73. 271a19–22 (Fig. 4).

eternal, as its spatial movement in a circle, due to what cause does it spatially move in one direction and not in the other? For it is necessary for this either to be a starting-point or that there be a starting-point of it.

To try to prove all things, omitting nothing, in the same way as one does certain things, would perhaps seem to be a sign of great naivete or of great audaciousness. But it is not just, at any rate, to censure in the same way all [who do try]. Instead, one must look to see what the cause is of their saying what they say, and furthermore in what way they have hold of their conviction, whether in a merely human way or something stronger. Indeed, when someone hits on necessities that are more exact, then one must show gratitude to the discoverers; for now, though, we must state what **288^{a}1** appears to be so.

For if nature always produces the best of the things that are possible, and if, just as in the case of rectilinear spatial movements, that toward the upper place is more estimable (for the upper place is more divine than the lower), and in the same way too forward spatial movement is more estimable than backward, and[74] if indeed [the heaven] has a right and a left, as was said previously[75] (and the puzzle just stated testifies that it does), it has a priority and a posteriority; for this cause resolves the puzzle. For if things are in the best state possible, this would in fact be the cause of what was stated; for it is best to be moved with a simple, unceasing movement, and for this to be in a direction that is more estimable.

2.6
Why the Primary Heaven's Movement Is Regular Rather Than Irregular

As regards the movement of it, that it is regular and not irregular is the next issue that should be discussed. I mean this about the primary heaven and about the primary spatial movement; for in the lower [places] several spatial movements have already come together into one.

For if it moves irregularly, it is clear that there will be an acceleration, top speed, and deceleration of the spatial movement; for every irregular spatial movement has an acceleration, top speed, and deceleration too. And the top speed occurs either at the point from which a thing moves, at the point to which it moves, or at the mid-point—for example, perhaps for things spatially moving in accord with nature it is at the point to which they move, for those that move contrary to nature it is at the one from which they move, and for projectiles at the mid-point. Of spatial movement in a circle, on the other hand, there is no point from which, point to which, or mid-point; for of it there is simply neither starting-point, limit-point, nor mid-point; for

74. Reading ἔχει δέ.
75. 285^{a}31.

in time it is eternal and in length joined in one and unbroken. So if there is no top speed of its spatial movement, there will be no irregularity either; for irregularity comes about because of deceleration and acceleration.

Further, since everything that moves is moved by something, it is necessary for irregularity of movement to come about either because of the mover, because of the thing moved, or because of both; for if the mover did not move it with the same capacity, or if the thing moved alters and does not remain the same, or if both changed, nothing prevents the thing moved from moving irregularly. But none of these can possibly come about in the case of the heaven; for it has been proved[76] that the thing moved is primary, simple, incapable of coming to be, and wholly unchangeable. But it is much more reasonable for the mover to be like this; for the primary one is capable of moving the primary one, the simple one is capable of moving the simple one, and the one incapable of passing away and coming to be is capable of moving the one incapable of passing away and coming to be. Since, then, the thing moved, which is a body, does not change, neither will its mover, which is incorporeal, change. So it is also impossible for its spatial movement to be irregular.

For if it becomes irregular, either it changes as a whole and becomes faster at one time and slower again at another, or its parts do. But that its parts are not irregular is evident; for it would, in the unlimited time, by now have produced a difference in the distances of the stars, if one part were moving faster and another slower. But none of these distances is observed to vary.

But neither is it possible for the whole to change; for the deceleration of a given thing results from incapacity, and incapacity is contrary to nature; for in fact the incapacities in animals are all contrary to nature—for example, old age and wasting away. For presumably the whole composition of animals is made up of the sorts of things that differ in their proper places; for none of their parts occupies its own proper space.

If, then, among the primary things there is nothing contrary to nature (for they are simple, unmixed, and in their proper space, and nothing is contrary to them), there would not be any incapacity either, and so no acceleration or deceleration; for if there is acceleration, there is also deceleration.

Further, it is also unreasonable that the mover is incapable of doing so for an unlimited time, and capable of doing so again for another unlimited one; for nothing appears to be contrary to nature for an unlimited time (and incapacity is contrary to nature), nor contrary to nature and in accord with nature for an equal time, nor, in general, capable and incapable for an equal time. And it is necessary, if the movement decelerates, that it do so for an unlimited time. Moreover, neither is it capable of always accelerating nor again of always decelerating; for then the movement would be unlimited and indefinite, but all movement, we say, is from something to something—that is, definite.

76. 1.2–3.

Further, if someone assumes there is some least time, which it is not possible for the heaven to move in a lesser one than (for just as it is not possible to play the lyre or to walk in any time whatever, but rather for each action there is a definite least time which cannot be surpassed, so too it is not possible for the heaven to move in any time whatever)—if, then, this is true, there would not always be an acceleration of **289a1** movement (and if there is not acceleration, neither is there deceleration; for the same goes for both and each), if indeed it accelerates by identical or increasing increments of speed, and for an unlimited time.

It remains, then, to say that the movement is alternately faster and slower. But this is entirely unreasonable and like a fabrication. Further, if such were the case, it is also more reasonable that it not go unnoticed; for things put next to each other are easier to perceive.

About the fact that there is only one heaven, then, and that it is incapable of coming to be and is eternal, and further, that it moves in a regular way, let this much suffice for us.

2.7
The Stars

We should next speak about what are called "stars," what they are composed of, in what sorts of shapes, and what their movements are.

It is most reasonable, then, and follows from what we have said, to make each of the stars be composed of the body in which it has its spatial movement, since we said[77] that there is something that is of a nature to spatially move in a circle; for just as those who declare that the stars are fiery do so because they say that the upper body is fire, and that it is reasonable for each to be composed of what it is in, so we too are speaking in a similar way.

The heat and light from the stars come about when air is chafed by their spatial movement. For movement is of a nature to ignite even wood, stones, and iron. It is more reasonable, then, for it to do the same to what is closer to fire, and air is closer to fire—as, for example, in the case of spatially moving missiles; for these are themselves ignited to such an extent that lead balls melt, and, since these are ignited, it is necessary for the air around them to be affected in the same way. These missiles themselves, then, are heated up because of their spatial movement in air, which becomes fire because of a blow struck by the movement.[78]

Each of the upper things spatially moves in its sphere, so that, though they themselves cannot ignite, the air beneath the sphere of the rotating body is necessarily

77. 1.2–3.
78. *Mete*. 341^{a}17–31.

heated up, especially there where the sun happens to be fixed. That is why heat comes about when the sun gets closer, rises, and is over us.

About the fact that the stars are neither fiery nor spatially move in fire, then, let us say this much.

2.8
The Stars' Spatial Movement

289b1 Since both the stars and the whole heaven appear to change position, it is necessary for the change to occur either with both being at rest, both moving, or one being at rest and the other moving.

For both to be at rest is impossible, if the earth is at rest; for then the things that appear to be the case would not come about. And so let it be assumed that the earth is at rest. It remains, then, that both move, or that one moves and the other is at rest.

If, then, both move, it is unreasonable for the speeds of the stars and of their circles to be the same; for then each star will be equal in speed to the circle on which it is carried. For they appear to return to the same point at the same time as their circles. The result, then, is that a star has traversed its circle at the same time as its circle has carried out its own spatial movement in traversing its circumference. It is not reasonable, however, for the speeds of the stars and the magnitudes of their circles to stand in the same ratio. For it is not at all absurd—rather, it is necessary—for the circles to have speeds proportional to their magnitudes, but for each of the stars in them it is not reasonable at all. For either the star spatially moving in the greater circle will of necessity move faster, in which case it is clear that even if the stars were transferred to each other's circles, one will be faster and the other slower (in this way they would not have their own movement, but they would be carried by their circles). Or, if it happened by chance, it would still not be reasonable for it to happen in such a way that in every case the circle was greater and at the same time the spatial movement of the star on it was faster; for there is nothing absurd about one or two cases being this way, but for all alike to be so seems like a fabrication. At the same time too, luck is not found in things that are by nature, and what holds by luck is not what holds everywhere and in all cases.

But then again if the circles remain at rest while the stars themselves move, there will be the same unreasonable results, and in the same way; for the result will be that the outer stars move faster, and that their speeds are in accord with the magnitudes of their circles.

Since, therefore, it is not reasonable either that both move or that the star alone does,[79] it remains that the circles move while the stars remain at rest, and, fixed to their circles, are carried around; for in this way alone nothing unreasonable results;

79. Reading τὸ ἄστρον μόνον.

for [first] it is reasonable for the speed of the larger circle to be faster where the circles are fixed around the same center (for just as in the case of other things the greater body carries out its own proper spatial movement faster, so it is too in the case of bodies moving in a circle; for of arcs cut off by lines from the center, that of the greater circle is greater, so that it is reasonable for the greater circle [and the smaller one] to rotate in an equal time), and [second,] the result is, both because of this and because it has been proved that the whole is continuous,[80] that the heaven is not dispersed.

Further, since the stars are spherical, as others too say, and for us it is consistent to say, generating them as we do from that body,[81] and since of what is spherical there are two intrinsic movements, rolling and rotation, if indeed, then, the stars move because of themselves, they should move with one or other of these movements. But they appear to move with neither.

For in rotating they would have remained in the same place and not have changed it, which is precisely what they appear to do and everyone says they do. Further, it is reasonable for all of these to be moved with the same movement, but among the stars only the sun seems to do this in rising and setting, and it seems so not because of itself [rotating], but because of the distance from our sight; for sight, when extended a great distance, wobbles because of its weakness. This is precisely the cause too, perhaps, of the fixed stars appearing to twinkle, and of the planets not appearing to twinkle; for the planets are close by, so that sight reaches them while it is strong, but when it reaches the fixed stars, it shakes because of the distance, that is, because it is stretched out too far. And its trembling makes the movement seem to be the star's; for it makes no difference whether our sight moves or the thing seen does.

Moreover, it is evident that the stars do not roll either; for it is necessary for a thing that rolls to turn about, but the so-called face of the moon is always visible.

So, since it is reasonable that in moving because of themselves they move with their own proper movements, but they are not observed to move in this way, it is clear that they cannot move because of themselves.

In addition to this, it is unreasonable that nature gave them no instrument for movement (for nature does nothing by luck), and that it should care for animals, but overlook such estimable beings. Instead, it seems that nature, as if advisedly, excluded anything by means of which they could move forward by themselves, and that it set them at the greatest distance from things that have instruments for movement.

That is why it would also seem to be reasonable for the whole heaven and each of the stars to be spherical. For the sphere is the shape most useful for movement within itself (for as such it can at once move fastest and most of all occupy the same place), while for forward movement it is the least useful; for it is least similar to those things that move because of themselves; for it has nothing appended or projecting, as the

80. 287^{a}2–11, 287^{a}30–^{b}14.
81. I.e., ether.

rectilinear figure does,[82] but stands farthest apart from the shape of bodies that move by walking).

Since, then, it is necessary for the heaven to move with a movement within itself, but for the stars[83] not to move forward because of themselves, it is reasonable for each to be spherical; for most of all as such, the one will move and the others will be at rest.

2.9
No Harmony of the Spheres

It is evident from these considerations that the view that a harmony is produced when they [the heavenly bodies] spatially move, since their sounds are in concord, though stated in an extraordinarily subtle way by those who express it,[84] does not thereby have any truth to it. For it seems to certain people that it is necessary for a sound to be produced when such large bodies spatially move, since this happens even in the case of the ones around us, which do not have equal mass or spatially move with such a speed. But when the sun and the moon, and further, stars of such number and magnitude, spatially move with such speed, it is impossible for some sound, inconceivable in magnitude, not to be produced. Assuming these things, as well as that the speeds, based on the distances, have the ratios of musical concords, they say that, when the stars spatially move in a circle, the sound is in harmony. But since it seems unreasonable that we do not also hear this sound, they say that the cause of this is that the sound is present straight from our birth, so that it is not distinguishable from the silence contrary to it; for sound and silence are distinguished in relation to each other. So just as to coppersmiths, because of what they are accustomed to, sound and silence do not seem to differ, to human beings too the same thing happens.

These things, then, as was said earlier, are harmoniously and musically stated, but it is impossible for them to be this way. For it is not only absurd that nothing is heard (they do try to resolve[85] [the puzzle] about its cause), it is also absurd that nothing is affected apart from perception. For excessive sounds shatter the masses even of inanimate bodies—for example, that of thunder splits stones and
291ᵃ1 the toughest of bodies. With so many things spatially moving, and the sound passing through being proportional to the spatially moving magnitude, it is necessary for a magnitude that is many times greater to reach here, and for the strength of its force to be inconceivable. But it is reasonable [to conclude] that we do not hear it, and that bodies are manifestly not affected forcibly by it, because no sound is produced.

82. The projections or appendages are presumably the angles or edges of its faces, which are imagined as sticking out from the inscribed sphere.
83. Reading τὰ δ᾽ἄστρα.
84. Identified at 291ᵃ8 as Pythagoreans.
85. Reading λύειν.

At the same time the cause of these things is clear, and is witness to the truth of the accounts we have stated; for what puzzled the Pythagoreans and made them say that there is a concord in the moving things is a proof for us.

For whatever things are themselves in spatial movement produce a sound and a blow, while whatever things are fixed to or present in a spatially moving thing, such as the parts in a ship, cannot produce a sound, nor could the ship itself if it were carried along on the river. And yet it would be possible to come forth with the same arguments, saying that it is absurd if, when spatially moving, the mast and the stern of so large a ship do not make a great sound, or again the ship itself when it is spatially moving. But though when something spatially moves in something not spatially moving, it does produce a sound, when it is in, and continuous with, something spatially moving and does not produce a blow, it cannot produce a sound. So in the present case one must say that if indeed the bodies of the stars are moving either in a quantity of air or of fire spread through the universe, as everyone says, it is necessary for them to produce a sound of enormous magnitude, and if this happens, for it to reach here and shatters things. So, since it is evident that this does not result, none of the stars could be spatially moving with either an animate or a forced spatial movement, as if nature foresaw the future, namely, that if they did not have their movement in this way, nothing in the place around here would be the same.

That, then, the stars are spherical and that they do not move because of themselves, has now been stated.

2.10
The Stars' Order

As to their order—the way in which each moves, some being prior and some posterior, that is, how they are related to each other with respect to their distances—let a theoretical grasp be gotten on it on the basis of astronomical accounts;[86] for they speak adequately about it. And it turns out that the movements of each are in proportion to their distances, one lot being faster and the other slower; for since the outermost revolution of the heaven is assumed to be at once simple and fastest, while those of the others are slower and many (for each is carried on its own circle **$291^{b}1$** in a direction contrary to the heaven), it is reasonable immediately that the one closest to the simple and primary revolution traverses its own circle in the longest time, the furthest away in the shortest, and in the case of the others, always the closer in a longer time, the further away in a shorter one. For the closest is most of all controlled by the primary locomotion, the furthest away least of all, because of the distance, and the intermediate ones in proportion to the distance—as the mathematicians also prove.

86. *Met.* 12.8.

2.11
The Stars' Shape

The shape of each of the stars one would most reasonably assume to be spherical. For since it has been proved[87] that they are not naturally such as to move because of themselves, and nature produces nothing unreasonably or pointlessly, it is clear that it also gave to these unmoving things a shape that is least capable of movement. But the sphere is least capable of movement because it has no instrument for movement. So it is clear that the stars will be spherical in mass.

Further, it is similarly so for one and all. The moon, on the other hand, proves itself to be spherical by the evidence of sight; for otherwise it would not be mostly crescent-shaped or gibbous in the greater part of its waxing and waning, and only at one time semicircular. And, again, [it is proved] through astronomy that the eclipses of the sun would not be crescent-shaped [if the moon were not spherical]. So if indeed one star is like this, it is clear that the others too would be spherical.

2.12
Two Puzzles about the Stars' Movements

There are two puzzles, which it makes perfect sense for anyone to puzzle over, about which we must try to state what appears to be so, thinking such audaciousness to be reverence rather than rashness, if someone, because of his thirst for philosophy, is content to become a little more puzzle-free concerning the things about which we have the greatest puzzlement.

Among the many things of this sort, not the least wondrous is what the cause is due to which it is not those bodies that are more distant from the primary spatial movement that always have more movements, but rather that the intermediate ones have the most. For it would seem reasonable, since the primary body has one spatial movement, for what is closest to it to move with the fewest movements—for example, two, the next three, or that there be some other order of this sort. But as things stand, the contrary is the case; for the sun and the moon move with fewer movements than some of the wandering stars.[88] And yet these are further away from the center and closer to the primary body. And in some cases this has even been made clear by sight; for we have seen the moon, when half-full, move under the star of Ares [Mars], which was occulted by the dark half of the moon, and come out on its light and bright side.[89] The ancient Egyptians and Babylonians, who have kept a close watch

87. 2.8.
88. *Met.* 10.8 explains.
89. Dating the sighting to May 4, 357 BC between 7:49 and 8:00 p.m. ± about 1,000 seconds, Athens mean time.

for the most years, speak similarly about the other stars as well, and from them we have acquired many convictions about each of the stars.

One might justly raise this puzzle and also that of what exactly the cause is due to which the multitude of stars in the primary spatial movement is so great that their whole order seems to be uncountable, while each one of the other stars is separate, and two or more do not appear fixed on the same spatial movement.

As regards these issues, then, it is well to seek to increase our comprehension, even though we have few things to start from and are at such a great distance from what happens concerning them. Nonetheless, for those who get their theoretical grasp on the basis of things of the following sort, what is presently puzzling would not seem to be at all unreasonable. We think about these stars as bodies only, that is, as units having a certain order, altogether inanimate. But we should conceive of them as if they participated in action and life; for in this way what happens will not seem at all contrary to reason. For it seems that the good belongs without action to what is in the best state, to what is closest by means of one small action, and to what is further away by means of several actions. It is just as in the case of the body: one is in a good state without exercising, another by walking around a little, a third needs running, wrestling, and hard training, while to another again this good would not yet belong no matter how much exertion he undergoes, but rather a distinct one.

It is difficult to attain success either in all things or often—for example, to make ten thousand Chian throws at knucklebones is inconceivable, but one or two is comparatively easy.[90] And, again, when it is necessary that one do this for the sake of that, and that for the sake of something else, it is easy to succeed at one stage or two,[91] but when it is through a greater number, it is more difficult.

That is why one should think the action of the stars to be like that of animals and plants. For here the actions of human beings are in fact most numerous; for it is possible to attain many goods, so that it is possible to do many things in action, and for the sake of other ones. (What is in the best state, by contrast, has no need of action; for it is itself the for-the-sake-of-which; but action is always in two [varieties]: when it is the for-the-sake-of-which and when it is what is for the sake of that.) The actions of the other animals, on the other hand, are fewer, and of the plants perhaps one small one; for either there is some one thing which they may attain, as there is for a human being too, or all the many things are a route toward the best one. One thing, then, has and participates in the best, one reaches close[92] to it by means of few [steps], another by means of many, and another does not even try, but it is sufficient for it to come close to the ultimate [end]. For example, if health is the end, one thing, then, is always healthy, another is healthy after slimming down, another after running and slimming down, another after doing some other action for the sake of running, so

90. The equivalent of throwing ten thousand double sixes at dice.
91. Reading ἑνὶ καὶ δυσὶ.
92. Reading ἐγγὺς.

that its movements are more numerous; a distinct one, though, is incapable of getting closer to being healthy, but only to running or slimming down (and one or the other of these is the end for them). For, on the one hand, it is best of all for each to attain the end; but on the other, if this is not [possible], it would always be better to the degree that it got closer to the best one.

And this is why the earth does not move at all, and things close to it have few movements; for they do not reach the ultimate [end], but as far as is possible attain the most divine starting-point. The primary heaven, however, attains this directly by means of a single movement. But the bodies intermediate between the first and the last ones, though they do attain it, do so by means of more movements.

As to the puzzle that in the primary spatial movement, though it is one, a great number of stars is involved, while each of the other stars has separately received its own movement, one might reasonably think that this holds primarily because of one thing; for one should understand that in the case of each one's life and starting-point the primary one has a great superiority over the others, and this superiority would turn out to be proportional; for the primary movement, though one, moves many divine bodies, while the others, though many, each moves only one; for any one of the planets spatially moves with several spatial movements. In this way, then, nature both equalizes things and produces a certain order, having given many bodies to the one spatial movement, and many spatial movements to the one body.

And further, it is because of this that the other spatial movements have one body, namely, that the spatial movements before the final one, which has one star, move several bodies; for the final sphere is carried fixed on many spheres, and each sphere is a body. The work of this final sphere, then, would be common [to all of them]; for while each sphere has a spatial movement that is by nature special to it, the other spatial movement is, as it were, added on; besides, the capacity of every limited body is related to a limited one.

About the stars spatially moving with circular movement, it has been stated what they are like with respect to their substance and with respect to their shape, as well as with regard to their spatial movement and order.

2.13
The Earth (1)

It remains to speak about the earth, where it is situated, whether it is among things at rest or things moving, and about its shape.

About its position, then, not everyone has the same belief, but most people say that it is situated at the center (as do all those who say that the whole heaven is limited). But the Italian thinkers, the ones called "Pythagoreans," say the contrary;[93]

93. In particular, Philolaus of Croton, A16–17 DK.

for they say that at the center there is fire, and that the earth, which is one of the stars, spatially moves in a circle around the center to produce night and day. Further, they establish another earth opposite to this one, which they call by the name "anti-earth," not seeking their accounts and causes with an eye toward the things that appear to be so, but rather dragging the things that appear to be so toward certain of their accounts and beliefs, and trying to cosmeticize them to make them fit.

Many others[94] might believe along with them that one should not assign the region of the center to the earth, but their conviction is based not on looking at the things that appear to be so but rather on arguments. For they think that it is fitting for the most estimable region to belong to the most estimable thing, that fire is more estimable than earth, the limit than the intermediate, and that the extremity and the center are limits. So analogizing on the basis of these considerations, they think that the earth is not situated at the center, but rather fire is.

Further, the Pythagoreans, at any rate, also because it is most fitting that the most controlling [element] of the universe be safeguarded, and the center is like that, name the fire that occupies this region "the guard of Zeus"—as if center were said unconditionally, and the center of its magnitude were also the center of the thing and of its nature! And yet, just as in the case of animals the center of the animal and of its body are not the same,[95] one should rather suppose it to be this way too in the case of the whole heaven. Due to this cause, then, there is no need for them to be disturbed about the universe, nor to introduce a safeguard at the center; instead they should seek that [very] center, what sort of thing and where it naturally is. For that center is a starting-point and is estimable, while the center of the place is more like an ending than a starting-point; for the center is what is determined, the limit what determines. And what encompasses, that is, the limit, is more estimable than what is limited; for the second is matter, but the first is the substance of the composition.

About the place of the earth, then, some hold this belief, and things are similar in the case of its immobility and movement; for not everyone conceives of them in the same way. Rather, those who say that it is not situated at the center say that it moves in a circle around the center, and that not only the earth does so, but also the anti-earth, as we said previously.[96]

Some people[97] even believe that several bodies of this sort may spatially move around the center, invisible to us because of the interposition of the earth. This, they say, is also why eclipses of the moon are more numerous than those of the sun; for each of the spatially moving bodies, and not only the earth, blocks it. For since the earth is not the center, but is distant from it by a whole hemisphere, they think that even if we do not dwell at the center, there is nothing to prevent things from

94. Probably Platonists, whom Aristotle often criticizes for being too fond of argument and too neglectful of perceptual evidence.
95. *PA* 665^{b}18–21.
96. 293^{a}24.
97. Certain Pythagoreans.

appearing in the same way as they would if the earth were at the center; for even as things stand nothing makes it clearly visible that we are at a distance of half a diameter from the center.

Some people also say that the earth, which is situated at the center, winds—that is, moves—around the pole stretching through the universe, as is written in the *Timaeus*.[98]

There is much the same dispute concerning its shape. Some believe that it is spherical, some that it is flat and drum-shaped.[99] The latter produce as proof that, in
294a1 setting and rising, the sun appears to make the part concealed by the earth a straight line rather than a curved one, while if indeed the earth were spherical, the line cutting it would have to be curved. But these people do not take into account the distance of the sun in relation to the earth and the magnitude of its circumference, which, on the apparently small circles [of the sun on the horizon], appears straight from far away. They should not be unpersuaded, then, because of this appearance, that the mass of the earth is circular. But they add something further and say that because of its being at rest it is necessary for it to have the shape it does.

For in fact, of course, about the movement and immobility of the earth people have spoken in many ways. It is necessary, then, for a puzzle to strike everyone; for thought must be pretty anesthetized not to wonder how exactly a small piece of earth, raised up high and released, spatially moves and is unwilling to remain at rest, the larger always doing so faster, while if one were to raise the entire earth up high, it would not spatially move. But as things stand, heavy as it is, it is at rest. Moreover, even if, when its parts are spatially moving, one removed the earth from below them before they had fallen, they will spatially move downward if there is nothing resisting.

So it makes perfect sense that the puzzle became a philosophical issue for everyone. But one might wonder why the resolutions of it do not seem more absurd [to people] than the puzzle. For because of the considerations we mentioned some, such as Xenophanes of Colophon, say that what is below the earth is unlimited, saying that it is rooted in the unlimited, in order not to have the task of seeking the cause.[100] That is also why Empedocles chastises them in the way he does, saying:

> If the depths of the earth and plentiful ether are unlimited,
> Like the words spoken pointlessly by the tongue of many
> Mouths are poured out, of those who have seen little of the universe.[101]

Some say that the earth is situated on water. For this is the most ancient account that has come down to us, stated, they say, by Thales of Miletus, on the supposition that the earth remains at rest because it floats like a piece of wood, or something else

98. 40b–c.
99. E.g., Leucippus (A26 DK).
100. B28 DK.
101. B39 DK.

of this sort (for in fact nothing of this sort is naturally such as to remain at rest on air, but on water)—as if the same argument did not apply to the earth and to the water supporting the earth; for water is not of a nature to rest when raised up high either, but rests on something.

Further, just as air is lighter than water, water is also lighter than earth. So how is **294ᵇ1** it possible for a lighter thing to be situated below one that is heavier in nature?

Further, if indeed the whole earth naturally remains at rest on water, it is clear that each of its parts will too. As things stand, it is evident that this does not happen, but rather any random part spatially moves to the bottom, and the bigger one faster. 5

These people seem to inquire up to a certain point, but not as far as it is possible to take the puzzle. For it is customary for all of us to make our inquiry not with an eye to the thing at issue but with an eye to the person who says the contrary; for a person even inquires within himself up to the point at which he is no longer able to argue against himself. That is why a person who is going to inquire well must be capable of 10 objecting by means of objections proper to the relevant kind, and this comes from having a theoretical grasp on all the differences.[102]

Anaximenes, Anaxagoras, and Democritus say that the cause of the earth's remaining at rest is its flatness. For it does not cut the air below it but sits on it like a lid, which is precisely what bodies that are flat appear to do; for these bodies even have 15 difficulty being moved by the winds because of the resistance. They say that because of its flatness the earth does the same thing in relation to the underlying air (which, not having enough room to change its place, is at rest because of the mass [of air][103] below it), just like the water in clepsydras. And they state many proofs that air, when 20 it is cut off and remains at rest, is capable of bearing great weight.

First, then, if the shape of the earth is not flat, it cannot be because of its flatness that it is at rest. And yet, from what they say, the cause of its immobility is not flatness, but rather magnitude; for because of a lack of space, the air, not having a way 25 out, remains at rest because of its being large in quantity; and it is large in quantity because it is enclosed by the large magnitude of the earth. So, this would be the case even if the earth were spherical, but its magnitude were just as great; for according to their argument it will remain at rest.

In general, our dispute with those who speak in this way about the movement 30 of the earth is not about parts, but about a certain whole and totality. For one must determine at the start whether bodies have a certain movement by nature or none, and whether though by nature there is none, by force there is. But since determinations have been made previously about these matters,[104] as far as was in accord with the capacity that was at our command, we must use them as things **295ª1** taken for granted.

102. *Top*. 105ª21–25.
103. Reading ἀθρόῳ τῷ.
104. 1.2, *Ph*. 5.6.

For if they have no movement by nature, nor will they have one by force; and if there is neither one by nature nor by force, there will be no movement at all; for about these matters it was determined previously[105] that this result is necessary, and in addition that rest is not possible either; for just as movement belongs either by force or by nature, so too does rest.

But then if there is a certain movement in accord with nature, there could not be only forced spatial movement or forced rest. So if the earth now remains at rest by force, it also came together at the center by being carried [toward it] because of the vortex; for everyone says that this is the cause, on the basis of what happens in liquids or in the case of air; for, in these, greater or heavier things are always carried toward the center of the vortex. That is why, then, everyone who says that the heaven came to be says that the earth came together at the center; and they seek the cause of why it remains at rest there. And some, speaking in this way, say that its flatness and magnitude is the cause, while others, like Empedocles,[106] say that it is the spatial movement of the heaven which, rotating in a circle and spatially moving faster than the earth, prevents [the earth from moving], just like the water in ladles; for when in fact a [bronze] ladle spatially moves in a circle the water is often below the [rim of the] bronze [ladle] but nonetheless does not spatially move downward, though it is natural for it to spatially move so, due to the same cause. And yet if neither the vortex nor the flatness is doing the preventing, and instead the air [below] gives way,[107] where will the earth move to? For it moved to the center by force, and remains at rest by force. But it is necessary for it to have, at any rate, some spatial movement in accord with nature. Is this, then, upward, downward, or where? For it is necessary for it to have some sort of movement. But if it is no more downward than upward, and the air above does not prevent it spatially moving upward, nor would the air below prevent the earth from doing so downward; for it is necessary for the same things to be a cause of the same things for the same things.

Further, against Empedocles, one might also say the following. For when the elements had been disaggregated separately by the strife, what cause was there of the earth's immobility? For of course he will not make the vortex the cause also at that time. But it is indeed absurd not to reflect on the following question: previously the parts of the earth spatially moved toward the center because of the vortex; but what is the cause due to which all things that have heaviness now move toward the earth? For the vortex is not near us.

295b1 Further, due to what cause does fire spatially move upward? For it is not because of the vortex. But if it naturally moves somewhere, it is clear that one must suppose that the earth does too.

105. 1.2, but also 276a22–26.
106. B35 DK.
107. Reading ὑπελθόντος.

Moreover, heavy and light are certainly not determined by the vortex either; instead, heavy and light things exist prior [to the vortex], one lot going to the center, the other lot rising to the surface because of the movement. Therefore, the one lot were heavy and the other light before the vortex came to be, but by what are they determined? And what spatial movement is natural for them? And to where? For if the unlimited exists, it is impossible for there to be an up or down, and the heavy and light are determined by these.

Most people, then, spend their time on these causes. But there are some who say that the earth remains at rest because of the similarity, as among the ancient thinkers Anaximander does;[108] for it is no more fitting for what is situated at the center and stands in a similar relation to the extremes to spatially move upward than downward or to the side; and it is impossible for it to make a movement in contrary directions at the same time. So of necessity it remains at rest.

This, though stated in a subtle way, is not stated in a true one; for according to this argument, it is necessary for anything placed at the center to remain at rest, so that fire too will rest there; for what was mentioned is not a special affection of earth. But this is not necessary. For it is not only evident that it remains at rest at the center, but also that it spatially moves toward the center. For where any part of it spatially moves to, there is where it is necessary for the whole of it to spatially move to as well; and where it spatially moves to in accord with nature, there is where it also remains at rest in accord with nature. Therefore, it does not [remain at rest] because of standing in a similar relation to the extremes (for this is common to all), while spatially moving toward the center is a special affection of earth.

It is also absurd to inquire why earth remains at rest at the center, but not to inquire why fire does so at the extremity. For if the extremity is by nature its place, it is clear that it is necessary for there also to be some place for earth by nature. But if this place [at the center] is not its by nature, but instead it remains at rest because of the necessity of the similarity (as in the argument about the hair that, when stretched strongly but similarly in every direction, will not break; or the one about the person who is very hungry and very thirsty, but equally so, and at an equal distance from food and drink; for he too [so the argument goes] is necessarily at rest), they must inquire about fire's immobility at the extremes.

Also a cause of wonder is their inquiring about the immobility but not inquiring about the spatial movement of these things, that is, due to what cause one spatially moves upward and the other toward the center, when nothing hinders them.

Moreover, what they do say is not even true. To be sure it is coincidentally true, in the sense that it is necessary for anything to remain at rest at the center for which it is no more fitting to move here than there. But on this argument at least [the earth] will not remain at rest, not—to be sure—as a whole, but having been dispersed. For the same argument will also apply to fire; for once placed there it must remain at rest

108. A11, A26 DK.

in the same way as earth; for it will stand in a similar relation to any point of the extremities. But nonetheless it will spatially move away from the center (as it appears to do) toward the extremity, if something does not prevent it; except, not as a whole toward one point (for it is only on the basis of the argument from similarity that it is necessary for this to happen), but rather a proportional part to a proportional part of the extremity—I mean, for example, a quarter of it toward a quarter of the encompassing [extremity] (for no body is a point). And just as what is condensed can come together from a larger to a smaller place, so what becomes rarer can do so from a smaller to a larger one. So the earth would also move in this way away from the center, even on the argument from similarity, if this were not by nature the place of earth.

These, then, are pretty much all the suppositions about the shape of the earth, as well as about its place, immobility, and movement.

2.14
The Earth (2)

On our own behalf, let us first say whether the earth has a movement or remains at rest; for, as we said,[109] some people make it one of the stars, while others put it at the center and say that it winds—that is, moves—around the central pole. That this is impossible is clear if one takes as a starting-point that, if indeed it spatially moves, whether it is outside the center or at the center, it is necessary for it to be moved with this movement by force; for the movement does not belong to the earth itself; for then each of its parts would also have this spatial movement. But as things stand they all spatially move in a straight line toward the center. That is why [the proposed winding movement of it], being forced and contrary to nature, cannot be eternal. The order of the cosmos, however, is eternal.

Further, all spatially moving bodies that spatially move in a circle appear to be left behind and to move with more than one spatial movement, in addition to the **296b1** primary one, so that it would be necessary for the earth as well, whether it spatially moves around the center or while situated at the center, to move with two spatial movements. But if this happens, it is necessary for there to be a passing and turning of the fixed stars.[110] It is evident, however, that this does not occur, but that instead the same stars always rise and set at the same places on the earth.

Further, the spatial movement in accord with nature of the parts of earth and of the whole earth is toward the center of the universe; for it is because of this, indeed, that as things stand the earth is situated at the center. But since the center of both [the earth and the universe] is the same, one might raise this puzzle: toward which center do things having heaviness, in particular, the parts of the earth, spatially move

109. 293a17–b32.

110. The planets (including the sun and the moon) undergo a movement along the ecliptic as well as a sidereal movement along with the fixed stars.

in accord with nature—is it because it is the center of the universe, or because it is the center of the earth? It is necessary, surely, that it be toward that of the universe; for light bodies, in particular, fire, in spatially moving in the contrary direction to heavy ones, spatially move toward the extremity of the place that encompasses the center. It happens, however, that the center of the earth is the same as that of the universe; for heavy bodies also spatially move toward the center of the earth, albeit coincidentally, insofar as it has its center at the center of the universe. A sign that they also spatially move toward the center of the earth is that things having heaviness spatially moving toward it move not in parallel but at similar angles, so that they spatially move toward one center, which is also that of the earth.[111]

It is evident, therefore, that it is necessary for the earth to be at the center and immovable, both due to the causes mentioned and because things having heaviness that are thrown straight upward by force spatially move back again perpendicularly to the same point, even if the capacity involved throws them an unlimited distance.

That the earth, then, neither moves nor is situated outside the center is evident from these considerations. In addition, the cause of the earth's immobility is clear from what has been said. For if it is naturally such as to spatially move by nature from anywhere toward the center, as is evident it is, and fire in turn from the center to the extremity, it is impossible for any part of it to spatially move from the center unless it is forced; for one [body] has one spatial movement; a simple one has a simple one, not contrary ones; and one from the center is contrary to one toward the center. If, therefore, it is impossible for any part whatever to spatially move from the center, it is evident that it is yet more impossible for the whole to do so; for where the part is naturally such as to move to, is also where the whole is naturally such as to do so. So, if indeed it is impossible for it to move except because of a greater strength, it is necessary for it to remain at rest at the center.

Also bearing witness to these things is what is said by the mathematicians about astronomy; for the things that appear to be so, the interchange of the configurations by which the order of the stars is determined, presuppose that the earth is situated at the center.

About the place of the earth, then, and the manner of its immobility and movement, let this much be said.

As for its shape, it is necessary that it have a spherical shape; for each of its parts has heaviness up to the point at which [it is] near to the center, and when a smaller part is pushed by a greater one it cannot swell to form a wave, but rather the first is squeezed together by the second and combines with it, until it arrives at the center. One should understand what is being said as if the earth comes to be in the way in which some of the natural scientists say it came to be. Except that they give the force

111. Eratosthenes of Cyrene (297–195 BC) discovered this empirically by observing that the sun shone directly down a well at high noon on the day of the summer solstice in one place and cast a shadow on the side of another at a distant place directly south of the first. So it is at least possible that Aristotle knew it in the same way.

as the cause of the downward spatial movement. It is better, however, to set out what is true and say that this happens because what has heaviness is of a nature to spatially move toward the center. When the mixture, then, was [merely] potential, the things that were disaggregated spatially moved from every direction toward the center in a similar way. Whether, then, the parts were similarly divided at the extremes from which they were brought together toward the center, or were in another state, it will produce the same result. It is evident, then, that when bodies spatially move in a similar way from all directions toward a single center, the mass must become similar in every direction; for when an equal quantity is added in every direction, it is necessary for the extremity to be at an equal distance from the center; and this is the shape of a sphere. And it will make no difference to the argument even if its parts did not travel together in a similar way from all directions toward the center. For it is necessary for a greater part always to push forward a smaller one that is in front of it up to the center, when both have balance-weight, and for a heavier one to push a less heavy one forward up to this.

Indeed, the following puzzle that someone might raise has the same resolution as these [difficulties]: Since the earth is at the center and is spherical, if a heavy thing many times as heavy were added to one hemisphere, the center of the universe and of the earth will not be the same. So either the earth will not remain at rest at the center, or if indeed it does remain at rest, it will rest even without occupying the center, which is where it naturally moves to as things stand.

297b1 This, then, is what is puzzling. But it is not difficult to see [through] once we have tightened things up a little and determined the way in which we think of a body of any magnitude whatever as moving toward the center, when it has heaviness. For it is clear that it does not do so up to the point at which its extremity makes contact with the center. Instead, the greater body must exert mastery until it occupies the center with its center; for it retains its balance-weight up to this point.

There is no difference, therefore, between saying this of a clod, or of any random part, or of the whole of the earth; for the result was stated not because of smallness or magnitude, but with reference to everything that has balance-weight up to the center.

So whether it spatially moved from somewhere as a whole or in parts, it is necessary for it to move up to the point until it occupies the center in a similar way in every direction, the smaller parts being counterbalanced by the larger ones by the forward push of its balance-weight.

If, then, the earth has come to be, it is necessary for it to have come to be in this way, so that it is evident that its coming to be was spherical, and, if it has not come to be but persists forever, remaining at rest, it is necessary for it to be in precisely the same way as the way it would first have come to be in, if it had come to be.

According to this argument, then, it is necessary for the earth's shape to be spherical, and because all things having heaviness spatially move at similar angles and not in parallel, and this is natural for [what spatially moves] toward what is by nature spherical. Either the earth is spherical, then, or it is by nature, at any rate, spherical.

One must, however, speak of each thing as being the sort of thing it tends to be, and the sort it in fact is,[112] by nature, and not the sort it is by force and contrary to nature.

Further, [it is necessary for the earth's shape to be spherical] also because of what seems to be so according to perception; for otherwise lunar eclipses would not have sections of the sort they do; for, as things stand, in its monthly configurations the moon takes on all sorts of divisions (for it becomes straight, gibbous, and crescent), but during eclipses it always has a convex defining line, so that if indeed it is eclipsed because of the interposition of the earth, the circumference of the earth, being spherical, would be the cause of the [line's] shape.

Further, because of the appearance of the stars, not only is it evident that the earth is round, but also that its magnitude is not great; for when we change our position a little to the south or to the north the circle of the horizon clearly becomes visibly other than it was, so that the stars overhead change greatly, and the same ones do not appear to those who move to the north as to the south; for some stars are seen in Egypt and around Cyprus but are not seen in the regions to the north, and those stars always apparent in regions to the north set in the former regions. So not only is it clear from these things that the shape of the earth is round, but also that it is of a sphere that is not great in size; for otherwise it would not make [the changes of the horizon] so quickly visible when we have changed our position by so little.

That is why those who suppose that the place around the Pillars of Heracles is connected to that around India, and in such a way that there is one sea, do not seem to suppose anything too unconvincing: they say, using elephants as their proof, that their kind is found in both extreme places, on the supposition that it is because of the connection between these extreme places that they share this feature with each other.

Also, the mathematicians[113] who try to calculate the size of the earth's circumference say that it is about four hundred thousand stades. On the basis of these proofs, it is necessary not only for the mass of the earth to be spherical, but also for it not to be great in relation to the magnitude of the other stars.

BOOK 3

3.1
Summary of Previous Books and of Previous Views on Coming to Be

We have previously discussed the primary heaven and its parts, further, the stars spatially moving within it, of what they are composed and of what sort their nature is, and in addition [proved] that they are incapable of coming to be and incapable of passing away.

112. Reading ὃ ὑπάρχει.
113. Perhaps Archytas or Eudoxus.

Since of the things we say are by nature, some are substances, others works and affections of these—by "substances" I mean the simple bodies (for example, fire and earth and those co-ordinate with these), and whatever is composed of them (for example, the whole heaven and its parts), and, again, both animals and plants and their parts; by "affections" and "works," I mean the movements of these and of other [substances], that is, of whichever movements these, in accord with the capacity within them, are the cause; further, to their alterations and their transformations into each other)—it is evident that the investigation of nature is mostly concerned with bodies; for all natural substances are either bodies or come to be along with bodies and magnitudes. This is clear from the definition of what sorts of things are by nature and from the theoretical investigation of each of them.

We have now spoken about the first of the elements, about what sort its nature is, and [proved] that it is incapable of passing away and incapable of coming to be.[114] It remains to speak about the other two.[115] But at the same time it will turn out that speaking about them also involves having investigated coming to be and passing away; for either coming to be does not exist at all or exists only in these elements and the things composed of them. But perhaps this is what we must first get a theoretical grasp on: whether it exists or not.

Those prior [to us] who philosophized about the truth, however, have disagreed both with the accounts at present being stated by ourselves and with each other.

For some of them did away with coming to be and passing away altogether (for none of the beings, they say, either comes to be or passes away, but it only seems to us so)—for example, the followers of Melissus and Parmenides.[116] Of them, we must hold that, even if they speak correctly about other things, they do not do so in a way appropriate to natural science at least; for the existence of certain beings that are incapable of coming to be and are wholly immovable is rather a matter for an investigation that is distinct from and prior to the natural scientific one.[117] But because these thinkers assumed that there is no other sort beyond the substance of perceptible beings, and were the first to understand that there had to be certain natures of this [unchangeable] sort if indeed there was going to be any knowledge or wisdom, they transferred to perceptible beings the accounts applicable to those natures.[118]

Others, as if on purpose, had the contrary belief. For some—especially the followers of Hesiod, and next, of the others, the first people who spoke about nature—say that none of the things at issue is incapable of coming to be, but that all come to be, although some, having come to be, remain incapable of passing away, while others pass away again.

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114. I.e., primary body (284a30) or ether (270b22).
115. I.e., earth and fire, between which water and air are intermediate.
116. Aristotle discusses their views in *Ph.* 1.2.
117. I.e., primary philosophy (*Met.* 6.1).
118. This suggests that the followers of Parmenides and Melissus referred to include Platonists (*Met.* 1040b27–34, 1086a37–b6).

Others say that all things come to be and flow, none of them being stable, save one thing only that persists, from whose natural changing of shape all these things come. This is precisely what Heraclitus of Ephesus, among many others, seems to wish to say.

And there are also some who make all bodies capable of coming to be, putting them together from and dissolving them into planes.[119]

About the others there will be an account on another occasion.[120] But as for those who speak in this last way, that is, who compose all bodies from planes, it is a superficial matter to see that the other things they say are in conflict with mathematics.[121] And yet it is just either not to alter mathematics or to alter it [only] by means of arguments that are more convincing than its hypotheses. It is clear, then, that on the same account on which a solid is composed of planes, a plane is composed of lines, and these of points. But if so, it is not necessary for a part of a line to be a line. These are matters we have previously investigated in the discussions concerning movement,[122] [proving] that there are no indivisible lengths.

But as regards natural bodies, we should on this occasion too get a theoretical grasp on the impossible things that those who produce indivisible lines result in saying; for although the resulting impossibilities will follow for natural things as well, not all the ones that apply to the latter will apply to the others, because the others, the mathematical ones, are said of things on the basis of abstraction,[123] while the natural ones are said of things on the basis of an additional posit.[124]

There are many affections that cannot belong to indivisible things but necessarily belong to natural ones. For example, if there is an indivisible one;[125] for in an indivisible thing it is impossible for there to be something divisible, but all affections are divisible in two ways; for they are so either in form or coincidentally: in form, for example, of color, white, and black; coincidentally, if what it belongs to is divisible, so that the simple affections are all divisible in this way. That is why one must investigate the impossibility in the case of this latter sort.

If it is impossible, then, when each of the two parts has no weight at all, for the two together to have weight, while the perceptible bodies, either all or some, have weight (for example, earth and water), as our opponents themselves would admit, and a point has no weight at all, it is clear that neither do lines, and it they do not, then neither do planes, and so none of the bodies do either.

But then that a point cannot have weight is evident. For everything heavy can be heavier than something else, and everything light lighter—though perhaps what is

119. E.g., Plato, *Timaeus* 53a–57d.
120. There is some further discussion in 3.5, as well as in *Ph.* and *Met.*
121. The reference is probably to the Platonic rejection of geometrical points.
122. *Ph.* 5, 6, and 8.
123. *Met.* $1061^{a}28$–35.
124. I.e., perceptible matter (*Met.* 6.1).
125. Reading οἷον εἴ τί ἐστιν ἀδιαίρετον.

299ᵇ1 heavier or lighter is not necessarily heavy or light. Just as the great is greater [than something else], though what is greater is not always great; for there are many things that are unconditionally small, but nonetheless are larger than other things. If, then, something that, because it is heavy, would be heavier than something else, is necessarily greater by weight than it, everything heavy would be divisible. But a point was assumed to be indivisible.

Further, if what is heavy is something dense, and what is light something rare, and dense differs from rare in containing a greater quantity in an equal mass, then, if a point is heavy or light, it is also dense or rare. But what is dense is divisible, while a point is indivisible.

And if it is necessary for everything heavy to be either soft or hard, it is easy to infer an impossibility from this. For a soft thing is what can be pressed into itself, while a hard one is what cannot be pressed in. But what can be pressed in is divisible.

Moreover, no weight can result from things that do not have weight. For in the case of how many[126] will this in fact result and in what way? And how, without wishing to fabricate something, will they determine this? Also, if every weight greater than a weight is greater by a weight, it will follow that each of the parts that has no parts[127] will have weight; for if four points have weight, what is composed of a greater number of points has a weight greater than the weight of that body. And if it is necessary for a weight that is greater than a weight to be so by a weight, just as what is more white than something white is so by [a degree of] white, so that, when the weight equal [to four points] has been subtracted, the greater will be of greater weight by one point, and the result will be that the one point will also have weight.[128]

Further, if the planes can only be put together side-to-side along a line, it is absurd; for just as there are two ways [we might think] to put lines together, along the length [that is, end to end] and along the width [that is, one on top of the other], a plane should be the same way in regard to another plane. But a [Platonic] line is capable of being put together with a line by being put on top of it and not by being added to it [at its ends]. But then if indeed it is also possible [for planes] to be put together by being put one on top of the other, there will be some body that is neither an element nor composed of elements, consisting of planes put together in this way.

Further, if bodies are heavier due to the number of their planes, as is declared in
300ᵃ1 the *Timaeus*,[129] it is clear that the line and the point will also have weight; for they stand in a proportional relation to each other, as we also said previously.[130] If, on the other hand, they do not differ in this way but due to earth's being heavy and fire light,

126. Reading καὶ πῶς.
127. Reading ἕκαστον τῶν ἀμερῶν.
128. Reading ὥστε τὸ μεῖζον μιᾷ στιγμῇ βαρύτερον ἔσται ἀφαιρεθέντος τοῦ ἴσου, ὥστε καὶ ἡ μία στιγμὴ βάρος ἕξει.
129. 56b.
130. 299ᵇ18–23.

some planes will be heavy and others light. And what is more, their lines and points will be the same way; for the plane of earth will be heavier than the one of fire.

In general, the result is that either there is no magnitude at all, or magnitude can be done away with, if indeed as point stands in relation to line, line stands to plane, and it to body; for if all of them can be resolved into each other, they will be resolved into the primary ones, so that it is possible for points alone to exist, but no body.

Besides this, if time stands similarly, it would be done away with at a certain moment or could possibly be done away with; for the indivisible now is like a point on a line.

The same result follows for those who compose the heaven from numbers; for there are some thinkers, such as certain Pythagoreans, who compose nature from numbers;[131] for it is evident that natural bodies have heaviness and lightness, while units can neither produce bodies by being put together nor have weight.

3.2
Every Simple Body Has a Natural Movement; How Non-natural Movement Occurs

That it is necessary for some movement to belong by nature to all simple bodies is clear from the following. For since it is evident that they move, it is necessary that they be moved by force, if they do not have a movement proper to them. But "by force" and "contrary to nature" are the same thing. But then if there is some movement [of them] contrary to nature, it is necessary for there also to be one in accord with nature, to which it is contrary. And if the movements contrary to nature are many, the movement in accord with nature is one; for each of them moves in accord with nature in a simple way, while contrary to nature each has many movements.

Further, this is also clear from rest; for rest too is necessarily either by force or in accord with nature. And a thing remains at rest by force where it spatially moves to by force, and remains at rest in accord with nature where it spatially moves to in accord with nature. Since, then, it is evident that something remains at rest at the center, if it does so in accord with nature, it is clear that its spatial movement thereto is also in accord with nature for it, while if it remains at rest there by force, what prevents it from spatially moving? If it is something at rest, we will recycle the same argument; for it is necessary that either it is in accord with nature that the first resting thing is at rest or it will go on without limit, which is precisely what is impossible. On the other hand, if something moving is what prevents it from spatially moving, as Empedocles says that the earth rests because of the vortex, where could the earth spatially move to, since to go on without limit is impossible?[132] For nothing impossible happens, and **$300^{b}1$**

131. *Met.* $1083^{b}8$–19.
132. $295^{a}7$–$^{b}9$.

to traverse what is without limit is impossible. So it is necessary for what spatially moves to stop somewhere, and there it remains at rest, not by force but in accord with nature. But if there is rest in accord with nature, there is also movement in accord with nature, namely, the spatial movement to this place [of rest in accord with nature].

That is why Leucippus and Democritus, who say that the primary bodies are always moving in the void and unlimited, must say what sort of movement it is and what movement of theirs is in accord with nature. For if the elements are moved by each other by force, still it is necessary for each also to have a movement in accord with nature, to which the forced one is contrary. Also the primary mover must move not by force but in accord with nature; for it will go on without limit, if there is not some primary mover that moves in accord with nature, but always a prior one that moves because it is moved by force.

The same difficulty necessarily results if, as is written in the *Timaeus*,[133] before the cosmos comes to be, the elements moved in a disorderly way. For it is necessary for movement to be either forced or in accord with nature. But if they were moved in accord with nature, it is necessary for there to be a cosmos—if one wishes to get a scientific theoretical grasp on the issue; for it is necessary for the primary mover to move itself, moving in accord with nature, and for the ones that are moving not by force and remain at rest in their proper places to produce the very order they have as things stand, the ones having heaviness [moving] toward the center, and the ones having lightness away from the center. And this is the order that the cosmos has.

Further, one might ask whether it is not possible for some of the things moving in a disorderly way to be so mixed together as to be the ones from which bodies composed in accord with nature are composed (I mean, for example, bones and flesh), as Empedocles says happens under the reign of love; for he says: "Many heads sprouted without necks."[134]

As for those who posit unlimitedly many things moving in unlimited [spatial movements], if their mover is one, it is necessary for them to be spatially moving with one spatial movement, with the result that they will not be moving in a disorderly way. On the other hand, if their movers are unlimitedly many, it is necessary for
301ᵃ1 the spatial movements to be many as well; for if they are limitedly many, there will be some sort of order; for it is not by their spatially moving to the same place that disorder results; for nor is the case, as things stand, that all things spatially move to the same place, but only those of the same kind.

Further, what is disorderly is nothing other than what is contrary to nature; for the proper order of perceptible things is nature. In any case, this very thing is absurd and impossible, that what is unlimited has a disorderly movement; for the nature of things is that which most of them have and for most of the time. The result, then,

133. 30a, 52d–53b.
134. B57 DK.

for these thinkers is the contrary, that disorder is in accord with nature, while order and the cosmos are contrary to nature; and yet nothing in accord with nature comes about by luck. It seems, though, that Anaxagoras grasped at least this correctly; for he starts his cosmogony from unmoving things. Others too try [elements that] are aggregating somehow and again moving and disaggregating. But to produce the coming to be [of the cosmos] from things divided up and moving is not reasonable. That is why Empedocles omits it from what happens under the reign of love; for he could not compose the heaven, establishing it from things separated but made to aggregate because of love; for the cosmos is composed of elements that are disaggregated, so that it is necessary for it to have come to be from a single aggregated thing.

That there is a natural movement for each of the [simple] bodies, with which it is moved neither by force nor contrary to nature, is evident from these considerations.

On the other hand, that it is necessary for there to be some that have a balance-weight of heaviness and lightness is clear from the following. For we say[135] that it is necessary for them to move. But if the moved thing will not have by nature a balance-weight, it is impossible for it to move either toward the center or away from the center.

For let A be without heaviness, and B have heaviness, and let the one without heaviness spatially move a distance CD, and let B in an equal time spatially move a distance CE (for the one that has heaviness will move a greater distance). If, then, the body that has heaviness is divided in the ratio CE to CD (for it is possible that this is the relation it stands in to one of its parts), if the whole spatially moves the whole of CE, the part must spatially move CD in an equal time. So what has no heaviness will spatially move the same distance as what has heaviness—which is precisely what is impossible. The same argument also applies to lightness.

Further, if there is to be some moving body that has neither lightness nor heaviness, it is necessary for it to be moved by force, and, if it is moving by force, it will make an unlimited movement. For since what moves a body is a capacity, and a smaller and lighter body will be moved further by the same capacity, let A, the one without heaviness, be moved a distance CE, and B, the one with heaviness, be moved CD in an equal time. If, then, the body having weight is divided in the ratio CE to CD, the result will be that the part subtracted from the body having heaviness is moved CE in equal time, since the whole was moved CD. For as the greater body is to the smaller, so will the speed of the smaller be to the speed of the greater. Therefore, a body without weight and one having weight will spatially move an equal distance in the same time. But this is impossible. So, since the body without heaviness will be moved a distance greater than any given distance, it would spatially move an unlimited one. It is evident, then, that it is necessary that every definite body have heaviness or lightness.

135. 300^{a}20–21.

Since nature is a starting-point of movement within the thing itself, a capacity is a starting-point of movement within another thing, or within the thing itself insofar as it is other, and all movement is either in accord with nature or by force, the one in accord with nature (for example, that of a stone downward), will be made faster by what is in accord with a capacity, while the one contrary to nature will be wholly due to this capacity. In either case, air is used like an instrument (for air is naturally both light and heavy). Insofar as it is light, it produces spatial movement upward, when it is pushed and gets a starting-point [of movement] from a capacity, and again downward insofar as it is heavy; for, in either case, the capacity transmits it by, as it were, attaching [it to the air]. That is why what is moved by force continues to spatially move without the mover following along with it. For without a body of this sort there would be no movement by force. And it assists the movement in accord with nature of each thing in the same way.

That all [definite bodies] are either light or heavy, then, and how movements contrary to nature take place in them, is evident from these considerations.

That there is neither coming to be of everything nor of simply nothing, is clear from what was said previously;[136] for it is impossible for there to be a coming to be of every body, unless it is also possible for there to be a void that is separated; for the place in which what is now coming to be will be, if it were to come to be, in this place it is necessary for there to be a void previously, since no body existed in it. For it is possible for one body to come to be from another (for example, fire from air), but, in general, for it to do so from no preexisting other magnitude is impossible. What is potentially a certain sort of body may certainly become such actively. But if the potential body is not actively some other body previously, there will be a void that is separated.

3.3
The Nature of an Element

It remains to say of what sorts of bodies there is coming to be and why. Since, then, in all cases knowledge is through the things that are primary, and primary among the constituents are the elements, we must investigate what sorts of the bodies in question are the elements, and why, and next after that what their number is and what their qualities are.

This will be evident once we have set down what the nature of an element is. Let, then, an element of bodies be what the other bodies are divided into, present in them either potentially or actively (for which of the two ways is still a matter for dispute), and is not itself divisible into things distinct in form; for something like this is what everybody in any context wishes to mean by "element."

136. 298ᵇ14–24.

If, then, what was stated is an element, it is necessary for there to be some bodies of this sort. For fire and earth are present potentially in flesh and wood and each thing of this sort; for it is evident that the former are segregated out of the latter. But neither flesh nor wood is present in fire either potentially or actively; for otherwise it would be segregated out. Similarly, even if there were only one thing of this sort, even then it would not be present in it; for if there is going to be flesh, bone, or any of the others whatever, we must not at all say that they are potentially present [in the element], but rather we must get a further theoretical grasp on what their mode of coming to be is.

Anaxagoras says things contrary to Empedocles about the elements. For Empedocles says that fire, earth, and the ones co-ordinate to these are elements of bodies and that everything is composed of these, while Anaxagoras says the contrary; for he says that the uniform things are the elements (I mean flesh, bone, and each of the others of that sort), and that air and fire are mixtures of these and of the other "seeds";[137] for each is composed of a mixum-gatherum of all invisible uniform things. That is why everything comes to be from these; for he calls fire and ether the same thing.

But since every natural body has a proper movement, and some movements are simple, others mixed, and mixed ones are of mixed bodies, and simple ones of simple bodies, it is evident that there will be certain bodies that are simple. For there are also simple movements. So it is clear that there are elements and why.

3.4
The Number of Elements; Atomism Refuted

The next thing to investigate would be whether there are a limited number of them or an unlimited, and if a limited one, how many they are.

First, then, we must theoretically grasp that there are not, as some people think, an unlimited number. And we will begin with those who make all the uniform things elements, as Anaxagoras also does. For none of those who think in this way correctly conceives of an element; for we see many mixed bodies that are divisible into uniform parts—I mean, for example, flesh, bone, wood, and stone. So if indeed what is composite is not an element, not every uniform thing will be an element, but rather one that cannot be divided into things distinct in form, as was said previously.[138]

Further, even if an element is conceived of in this way, it is not necessary to make an unlimited number; for one will achieve the same results if one takes them to be limited in number; for one will produce the same result, even if there are only two or three such things, as Empedocles tries to prove. For since even on their view not everything is produced from uniform things (for they do not produce faces from

137. B2–4 DK.
138. $302^{a}18$.

faces, nor any other of the things that in accord with nature have a certain shape), it is evident that it is much better to make the starting-points limited in number, indeed as few as possible, consistent, at any rate, with all the same things being proved to follow, just as the mathematicians also demand; for they always take starting-points that are limited in form or in number.

Further, if body is said to be distinct from body in accord with their proper differences, and the differences of bodies are limited in number (for they are differentiated by their perceptual qualities, and these are limited in number; but this must be proved), it is evident that it is necessary for the elements to be limited in number as well.

But then what other people—for example, Leucippus and Democritus of Abdera[139]—say does not have reasonable consequences either; for they say that the primary things are unlimited in number but indivisible in magnitude, and that neither do many things come to be from one nor one from many, but rather that it is by the interweaving—that is, the combination—of the primary ones that all things will come to be. For in a certain way these thinkers too make all the beings be numbers and composed of numbers; for even if they do not make it perspicuously clear, nonetheless this is what they wish to say.

Also, in addition to these considerations, since bodies differ in shape, and the shapes are unlimited in number, they say that the simple bodies are unlimited in number as well. But of what sort and what the shape of each of the elements is, they have not further determined at all, except they have assigned the spherical shape to fire.[140] On the other hand, air, water, and the others they determine by greatness and smallness, regarding their nature as a sort of a universal seedbed for all the elements.

First of all, then, Leucippus and Democritus make the same error of not taking a limited number of starting-points, though it is possible to state the same results from them.

Further, if the differences of the shapes are not unlimited in number, it is clear that the elements will not be unlimited in number.

In addition to these considerations, it is necessary to be in conflict with the mathematical sciences in speaking of indivisible bodies and to do away with many acceptable beliefs and things that appear to be so to perception, which have been spoken about previously in the [accounts] concerning time and movement.[141]

At the same time, though, it is even necessary for them to contradict themselves; for it is impossible, if the elements are indivisible, for greatness and smallness to differentiate air, earth, and water; for then they cannot come to be from each other; for the greatest bodies will always come to an end in being segregated out—which is the way they say water, air, and earth come to be from each other.

139. F194.
140. *DA* 403b28–404a16.
141. Especially *Ph.* 6.1–2.

Further, not even according to their supposition should one believe that the elements come to be unlimited in number, if indeed the [simple] bodies are differentiated by their shapes, and all shapes are composed of pyramids, rectilinear ones of rectilinear ones, and the sphere of its eight parts. For it is necessary that there be certain starting-points of the shapes. So whether they are one, two, or many, the simple bodies will be the same in number too.

Further, if for each of the elements there is a proper movement, and that of a simple body is simple, and the simple movements are not unlimited in number (because the simple spatial movements are not more than two and the places are not unlimited in number), the elements would not be unlimited in number either.

3.5
There Is More Than One Element

But since it is necessary for the elements to be limited in number, it remains to investigate whether there is more than one. For certain people suppose that there is only one, and some suppose that it is water, others air, others fire, and others something finer-grained than water and denser than air, which, being unlimited, they say encompasses all the heavens.

Those who make this one element water, air, or something more fine-grained than water but denser than air, and have other things come to be from these by rarefaction and condensation, all fail to notice that they themselves are making [an element] something that is prior to the element in question; for coming to be from their elements is composition, they say, and the one back into the elements, dissolution, so that it is necessary for the finer-grained one to be prior in nature. Since, then, they say that of all the bodies fire is the most fine-grained, fire would be primary in nature. But [whether it is fire or not] makes no difference, for it is necessary that a certain one among the other bodies be primary, and not the intermediate one.

Further, having the other things generated by condensation and rarefaction is no different from having them be so by fine-grainedness and density; for they wish the fine-grained to be rare, and the coarse-grained to be condensed. But, in turn, fine-grainedness and coarse-grainedness is the same as largeness and smallness; for what has small parts is fine-grained and what has large parts is coarse-grained; for what spreads itself out widely is fine-grained, and what is composed of small parts is like that. So for these thinkers the result is that it is by greatness and smallness that they distinguish the substance of the other [bodies]. But for those distinguishing things in this way the result will be to say that all things are relatives, and that fire, water, and air will not unconditionally be, but rather the same thing will be fire relative to one thing, but air relative to another. This is precisely what results too for those who say that there are several elements, saying that they differ [only] in greatness and smallness; for since each is defined by its quantity, their magnitudes will

be in a certain ratio to each other, so that it is necessary for the things that have this ratio to each other to be air, fire, earth, or water, because of the ratio between smaller magnitudes present in greater ones.

Those, on the other hand, who suppose fire to be the element avoid this [difficulty] indeed, but for them other unreasonable consequences necessarily result.

For some of them fasten a shape to fire, like those who make it pyramidal, and of these, the more simple-minded ones say that it is because the shape most capable of piercing is the pyramid, and the body most capable of doing so is fire; but the ones more subtle in argument put forward in addition that all bodies are composed of the most fine-grained one and the solid figures of pyramids, so that, since fire is the most fine-grained of the bodies, and the pyramid has the smallest parts and is primary, and the primary figure belongs to the primary body, fire would be pyramidal.

Others prove nothing by reasoning about the shape, but only make this body the finest-grained one, and say that from it in composition the others come to be, as if they were growing together specks of dust.

For both lots, however, the same difficulties result; for if they make the primary body indivisible, the arguments stated previously will come back again against this hypothesis.

Further, it is not open to those who wish to get a theoretical grasp on things in a way appropriate to natural science to say this. For if every body is comparable to another body with respect to quantity, and the magnitudes of the uniform ones stand in the same proportional relation to each other as their elements do (for example, as the magnitude of the totality of water is to that of the totality of air, so that of the element of the one is to that of the element of the other), and if there is more air than water, and, in general, more of a fine-grained one than of a coarse-grained one, it is evident that the element of water will also be smaller than that of air. If, then, the smaller magnitude is contained in the greater one, the element of air would be
304b1 divisible. And similarly for fire and, in general, for what is more fine-grained.

If, however, the primary body is divisible, then the result for those who assign a shape to fire is that a part of fire is not fire, because a pyramid is not composed of pyramids, and further, that not every body will be either an element or composed of elements (for a part of fire will be neither fire nor any other element). For those who differentiate by magnitude, on the other hand, the result is an element prior to their element, and this goes on without limit, if indeed every body is divisible, and the one with the smallest parts is their element.

Further, for these too the result is one of saying that the same thing is fire in relation to one thing, air in relation to another, and, again, water and earth.

An error common to all who suppose a single element is to produce one natural movement only, the same for everything. For we see that every natural body has a starting-point of movement. If, then, all the bodies are one thing, the movement of all of them would be one. And with this one it is necessary for them, by just as much as they become bigger, to move more, just as fire by as much as it becomes bigger,

spatially moves faster with the upward spatial movement that is its own. But the fact is that many things spatially move downward faster [the bigger they become].

So, because of these considerations, and in addition to them, seeing that it has been determined previously that there are several natural movements, it is clear that it is impossible for the element to be a single one. And since there is neither an unlimited number nor just one, it is necessary for there to be several and limited in number.

3.6
Elements Are Not Eternal but Come to Be from Each Other

First, though, we must investigate whether the elements are eternal or are coming to be and passing away; for when this is proved it will also be evident both how many and of what sort they are.

But for them to be eternal is impossible; for we see fire, water, and each of the simple bodies dissolving. And it is necessary for their dissolution either to be unlimited or for it to come to a stop. If it is unlimited, the time of their dissolution will also be unlimited, and, again, that of their composition; for each part is dissolved and constituted in a distinct time. So the result will be that outside the one unlimited time there is another unlimited one, when that of composition is unlimited and, a further one, that of the dissolution prior to it [was unlimited too]. So outside the unlimited time an unlimited one comes to be—which is precisely what is impossible. **305^{a}1**

On the other hand, if the dissolution will come to a stop somewhere, the body at which it stops will be either indivisible or, as Empedocles seems to wish to say, divisible though in fact never divided.

But indivisible it will not be, because of the arguments stated previously.[142] But then neither is it divisible though in fact never divided. For a smaller body is more easily destroyed than a larger one. If indeed, then, a larger one is destroyed by this process of destruction, so that it is dissolved into smaller ones, it is reasonable that a smaller one will be yet more affected by it. But we see fire being destroyed in two ways; for it is destroyed by being extinguished by its contrary, and also by itself, when it dies away. And the smaller is affected in this way by the larger, and the faster the smaller it is. So it is necessary for the elements of bodies to be capable of passing away and coming to be.

But since they are capable of coming to be, their coming to be will be either from an incorporeal thing or from a body, and, if from a body, either from another body or from each other.

The account saying that the elements are generated from an incorporeal thing produces a separated void. For everything that comes to be does so in something and that something in which the coming to be takes place will be either something

142. 299^{a}2–11, 303^{a}20–24.

incorporeal or something that has a body. And if it is one that has a body, there will be two bodies in the same place, the one that comes to be and also the preexisting one.[143] On the other hand, if it is incorporeal, it is necessary for there to be a definite void. But that this is impossible was proved previously.[144]

But then neither can the elements come to be from some body. For the result will be that there is another body prior to the elements. But if this one has heaviness or lightness, it will be one of the elements; and if it has no balance-weight it will be immovable and mathematical, and, being such, will not be in a place. For the place it is at rest in is the place it is also capable of moving in. And if by force, contrary to nature, and if not by force, in accord with nature. If, then, it is in a place, that is, somewhere, it will be one of the elements; while, if it is not in a place, nothing will be composed of it; for it is necessary for what comes to be and what it comes to be from to be together.

Since the elements cannot come to be either from an incorporeal thing or from another body, it remains for them to come to be from each other.

3.7
How Elements Come to Be from Each Other; the Views of Empedocles and Plato Refuted

Next in turn, then, we must investigate what the way is in which they come to be from each other, whether as Empedocles and Democritus say, as those who dissolve them into planes do, or in some other way beyond these.

305b1 Those who follow Empedocles and Democritus are unaware that they do not produce coming to be of one thing from another, but only apparent coming to be; for they say that each one is present and is segregated out, as if coming to be were from a vessel, and not from certain matter, and did not involve change.

Next, even if things were this way, the results would be no less unreasonable. For the same quantity does not seem to become heavier when compressed. But it is necessary for them to say this, if they claim that water is present in air and is segregated out of it; for water, when it comes to be from air, is heavier [than the air].

Further, in the case of mixed bodies, it is not necessary, when one of the two components is segregated out, for it always to occupy a bigger place. However, when air comes to be from water, it does take up a bigger place; for the finest-grained one comes to be in a bigger place. This is evident too, indeed, in a case of transformation; for when a liquid becomes vaporized or pneumaticized[145] the vessels encompassing the liquid masses break apart due to the lack of space [within them]. So if, in general,

143. *Ph.* 213b20.
144. 301b33–302a9.
145. *Juv.* 479b31–32, *GA* 755a14–21, 762a18–21.

there is not a void and bodies cannot expand, as those who say these things claim, the impossibility [of this phenomenon] is evident. On the other hand, if there is a void and expansion, it is unreasonable that of necessity what is segregated out always takes up a bigger place.

It is also necessary for the coming to be from each other to come to a stop, if indeed in a limited quantity there is not present an unlimited number of limited quantities. For when water comes to be from earth, a quantity is subtracted from the earth, if indeed coming to be is by segregating out. And, in turn, when one is subtracted from the remainder, it is the same way. If, then, this will go on forever, in what is limited what is unlimited will be present. Since this is impossible, the generation of the elements from each other could not go on forever. That their change into each other, then, is not by segregating out, has been recounted.

It remains that they come to be by changing into each other. And this in two ways; for it is either by change of shape, as from the same wax either a sphere or a cube can come to be, or by dissolution into planes, as some people say.

If, then, it comes about by change of shape, saying that the [simple] bodies are indivisible follows by necessity; for if they are divisible, a part of fire will not be fire, nor a part of earth earth, because a part of a pyramid is not in every case a pyramid, nor a part of a cube a cube.

On the other hand, if it comes about by the dissolution into planes, first, it is absurd that not all the elements are generated from each other, which is precisely what it is necessary for these people to say, and what they do say. For it is neither reasonable for one thing alone to be exempt from transformation, nor does it appear to be in accord with perception, but rather all alike appear to transform into each other. The result is that people speaking about the things that appear to be so say things that are not in agreement with the things that appear to be so. And the cause of this is not correctly grasping the primary starting-points, but instead wishing to lead everything back to certain previously determined beliefs. For presumably the starting-points of perceptible things must be perceptible, of eternal ones, eternal, of things capable of passing away, things capable of passing away, and, in general, each must be of the same kind as what falls under it. But out of love for these beliefs of theirs they seem to do the same thing as those defending their theses in [dialectical] arguments; for they submit to every consequence on the supposition that they possess true starting-points, as if starting-points must not sometimes be judged on the basis of what follows from them, and most of all on the basis of the end. And the end in the case of productive science is the work, and in that of natural science what appears to be so to perception has the controlling vote in every case.

The result for these thinkers is that earth is most of all an element, and it alone is incapable of passing away, if indeed the incapable of dissolving is incapable of passing away and is an element; for earth alone is incapable of dissolving into another body.

Moreover, in the case of those that do dissolve, the dangling of the triangles is not reasonable either.[146] But this happens whenever one thing is transformed into another, because of the numerical inequality of the triangles that compose them.

Further, it is necessary for those who state these views to make coming to be not be from a body; for when something comes to be from planes, it will not come to be from a body.

In addition to these things, it is necessary for them to say that not all body is divisible, yet this will conflict with the most exact sciences; for these, the mathematical ones, suppose even an intelligible [body] to be divisible, while these thinkers, because of their wish to save their hypothesis, do not even admit that all perceptible [body] is divisible. For it is necessary for those who produce a shape for each of the elements and define their substance by it to make these elements indivisible; for a pyramid or a sphere divided in a certain way will not leave a remainder that is a sphere or a pyramid. So either a part of fire will not be fire—but rather there will be something prior to that element, because everything is either an element or composed of elements—or else not every body will be divisible.

3.8
Elements Are Not Differentiated by Their Shape

In general, the attempt to assign a shape to the simple bodies is unreasonable, first, because the result will be that the whole will not be filled up; for among plane figures three shapes seem to fill the [whole of] place, triangle, square, and hexagon, and among the solids two only, pyramid and cube. But it is necessary to suppose more of these because they posit more [than two] elements.

Next, it is evident that all the simple bodies take their shape from the encompassing place, especially water and air. It is impossible, then, for the shape of the element to remain constant; for, if it did, the whole [thing] would not be on every side in contact with what encompasses it. But then if its shape will be changed, it will no longer be water, if indeed it was differentiated by [its] shape. So it is evident that there are no definite shapes for these elements.

Indeed, it seems that nature itself indicates to us what is in accord with reason; for just as in other cases the underlying subject must be formless and shapeless (for in this condition it would be most capable of receiving shape, like the all-receptive written about in the *Timaeus*[147]), in the same way too the elements must be considered as matter for the composite bodies. That is why indeed, being separate from their qualitative differences, they are capable of changing into each other.

146. When something composed of n + m triangles is dissolved into something composed of m triangles, n triangles will be left dangling, not composing any body at all. This is unreasonable because non-bodies cannot occupy space or drift around in it.
147. 50b–c.

In addition to these considerations, how is it possible for flesh, bone, or any other of the continuous bodies whatever to come to be? For they cannot do so from the elements themselves, because what is continuous does not come to be from what is composite, nor from the composition of planes; for it is elements that would come to be by composition and not the bodies composed of elements. So if one wishes to argue in an exact way and not accept views of this on the basis of a passing glance at the arguments, one will see that they do away with the coming to be of the beings.

Moreover, the shapes attributed to bodies are discordant with the very affections, capacities, and movements they especially looked toward in assigning the shapes as they do. For example, since fire is most capable of movement, and also is capable of heating and of burning, some people made it a sphere, others a pyramid; for these are the most capable of movement because they have minimal contact and are the least stable, and are also most capable of heating and most capable of burning, because the one is wholly angle, and the other has the sharpest angles, and it is by their angles, they say, that they burn and heat. **307^{a}1**

In the first place, with reference to movement both lots are in error; for even if these shapes are the most capable of movement, yet they are not most capable of the movement of fire; for that of fire is upward and rectilinear, while these shapes are most capable of moving in a circle—so-called rolling. Next, if earth is a cube because it is stable and remains at rest, but it remains at rest not in any random place but in its own place, and spatially moves away from anywhere else unless prevented, and fire and the others are the same way, it is clear that fire too and each of the elements will be a sphere or pyramid in an alien place, but in its proper one will be a cube.

Further, if fire heats and burns because of its angles, all the elements will be capable of heating, though one perhaps more than another; for all have angles—for example, the octahedron and the dodecahedron. (For Democritus indeed even the sphere, since it is a sort of angle, cuts because it is most capable of movement.[148]) So the elements will differ [only] in the more and less.[149] But it is evident that this is false.

At the same time it will result that even mathematical bodies heat and burn; for they too have angles and include indivisible spheres and pyramids (anyhow if, as these thinkers say, there are in fact indivisible magnitudes). For if one lot [of shapes] do and another lot do not [heat and burn], they must state the difference, and not state it simply in the way they do state it.

Further, if what is burned becomes fire, and fire is a sphere or pyramid, it is necessary for what is burned to come to be spheres or pyramids. Grant, as in accord with reason, that cutting and dividing are a result of these shapes. But that a pyramid of necessity produces pyramids or a sphere spheres is entirely non-rational, and is as if someone were to think a knife divides things into knives or a saw into saws.

148. When you bend a straight line it forms a sort of (blunt or curved-tip) angle. Thus a sphere is a solid (curved) angle.
149. *HA* 486^{a}14–^{b}22.

Further, it is ridiculous to assign the shape to fire only with a view to dividing; for fire seems more to aggregate and bring together than to disaggregate. For it disaggregates things of different kinds, but aggregates those of the same kind. And while
307b1 the aggregating is intrinsic to it (for bringing together and uniting are characteristic of fire), the disaggregating is coincidental (for it is in aggregating what is of the same kind that it removes what is alien). So either they should have looked toward both when they assigned [it a shape] or, better, toward the aggregating.

In addition to these considerations, since hot and cold are contraries in capacity, it is impossible to assign any shape to cold; for the shape assigned to it must be contrary to [the one assigned to hot], but no shape is contrary to a shape. That is why all these thinkers omit this.[150] And yet it was fitting to have defined all by shape or none. Some, though, in having tried to say something about this capacity contradicted themselves. For what has large particles, they say, is cold, because it compresses and cannot pass through the ducts.[151] It is clear, therefore, that what is hot would be what does pass through. But something of that sort always has small particles. So the result is that hot and cold are differentiated by their largeness and smallness, and not by their shapes. Further, if the pyramids are unequal in size, the large ones would not be fire and neither would their shape be a cause of burning, but rather the contrary.

It is evident, then, from these considerations that the elements are not differentiated by their shapes. And since the most fundamental differences of bodies are their affections, works, and capacities (for we say that each of the things that are by nature has works, affections, and capacities), we must speak about these first, in such a way that having got a theoretical grasp on them we would get hold of the differences between one another.

BOOK 4

4.1
Heavy and Light

Concerning heavy and light, what each of them is and what their nature is must be investigated, and due to what cause they have these capacities of theirs. For a theoretical investigation concerning these is proper to accounts dealing with movement; for we say that things are heavy or light in virtue of their being capable of being moved naturally in a certain way. (To the activations of these, though, names are not assigned, unless it was thought that "balance-weight" is such.)

150. I.e., assigning a shape to cold.
151. Plato, *Timaeus* 62a–b.

Because the study of natural science concerns movement, and these things have within them some spark, as it were, of movement, all thinkers make use of their capacities, but—except for a few—have not defined them. **308ª1**

Having first looked at what other people have said, then, and gone through the puzzles that it is necessary for this investigation to go through, let us then state the things that appear to us to be so about these matters.

Heavy and light, then, are said of things unconditionally and in relation to something else; for of things having heaviness, we say that one is lighter, the other heavier—for example, bronze is heavier than wood. About the ones said unconditionally nothing has been said by our predecessors, though about those in relation to something else they did speak; for they do not say what heavy is and what light is, but only what heavier or lighter is in things that have heaviness. This will be clearer if we state it as follows. For some things always and naturally move spatially away from the center, while others do so toward the center. Among these, the ones that spatially move away from the center move upward, I say, the ones toward the center downward.

For it is absurd not to think that there is up and down in the heaven, as some people claim; for there is no up and down, they say, if indeed the heaven is similar in every direction, and from whatever point a given person traverses it, he will come to his own antipodes.[152] For our part, we say that the extremity of the universe is up, both up as regards position and as being by nature primary. And since the heaven has an extremity and a center, it is clear that there will be an up and a down, as even ordinary people say, except not on adequate grounds. The cause of this inadequacy is that they think that the heaven is not similar in every direction, but that the hemisphere above us is the only one, since if they supposed in addition that it was like this all around, with the center similarly related to all of it, they would say that the extremity is up, the center down.

We say, then, that the unconditionally light is what spatially moves upward, that is, toward the extremity, and the unconditionally heavy is what spatially moves downward, that is, toward the center. By contrast, we say that one thing is light or lighter in relation to something else, when of two bodies having heaviness and being equal in mass, the other by nature spatially moves downward faster.

4.2
Examination of Previous Views

Among those of our predecessors, then, who set out to investigate these things, pretty much the majority have spoken only about what is heavy and light in this relative way, in which of two things having heaviness, one is lighter than the other. And

152. Plato, *Timaeus* 62b–63e.

having proceeded in this way they think they have also made determinations about
308ᵇ1 what is unconditionally heavy or light. But their argument does not apply to these. This will become clearer as we advance.

For some of them speak of lighter and heavier in the way one finds it written about
5 in the *Timaeus*,[153] where the heavier is what is composed of the greater number of the same sort of parts, the lighter what is composed of fewer, as in the case of lead a greater quantity of lead is heavier, and in the case of bronze a greater quantity of bronze. And likewise for each of the other bodies that are the same in form; for to be heavier lies in the superior number of equally [heavy] parts. And in the same way,
10 they say, lead is heavier than wood; for all bodies are composed of the same things and of one matter, though they do not seem to be.

Having made determinations in this way, then, they have said nothing about what is unconditionally light or heavy; for as things stand fire is always light and spatially moves upward, while earth and all earthen things spatially move downward, that is, toward the center, so that it is not because of the small number of the triangles
15 of which, they say, each [body] is composed, that fire naturally moves upward; for otherwise a greater quantity would have spatially moved less and been heavier, being composed of a greater number of triangles. But as things stand it is evident that the contrary happens; for the greater the quantity of fire, the lighter it is and the faster it spatially moves upward. And from up to down a smaller quantity of fire will spatially
20 move faster, and a larger one more slowly.

In addition to these considerations, since to be lighter is to have fewer of the homogeneous parts and to be heavier is to have more, and air, water, and fire are composed of the same triangles, though differing in being less numerous and more numerous, due to which some of these are lighter and others heavier, there
25 will be some quantity of air that will be heavier than water. But entirely the contrary happens; for the larger the quantity of air the more it always spatially moves upward, and any part of air whatever spatially moves upward out of water.

This, then, is the way some people have made determinations about light and heavy. Others, however, did not believe it sufficient to determine them in this way,
30 but rather, even though they are of an older generation, they had a more novel understanding of the things now being discussed. For it is evident that certain bodies, though their mass is smaller, are heavier than others. It is clear, then, that is not sufficient to say that bodies composed of an equal number of primary things are equal in weight; for then they would be equal in mass. While for those who say that planes are
35 the primary and indivisible things of which bodies having heaviness are composed,
309ª1 it is absurd to say this; for those who say that they are solids it is more open to say that the greater of them is the heavier. As for composites, since it is evident indeed that not each of them has [heaviness] in this way, but we see many heavier ones to be smaller in mass (for example, bronze in comparison to wool), some people think up

153. 63c–e.

and state another cause; for the void enclosed in the bodies lightens them, they say, sometimes making the larger ones lighter; for they have more void. For it is because of this too that the greater mass is often composed of the same number of solid particles [as the lesser] or even of fewer. And in general, in fact, in every case the cause of being lighter is enclosing more void.

They speak, then, in this way. But it is necessary for those who make their determinations in that way to add that the body not only contains more void, but also less of what is solid; for if the proportion of solid will exceed that of void, it will not be lighter. For it is because of this too, they say, that fire is lightest, because it contains more void. The result will be, then, that a large quantity of gold containing more void will be lighter than a small quantity of fire, unless it also contains many times as much solid. So this must be said [in addition].

Among those denying the existence of a void, some have determined nothing about light and heavy—for example, Anaxagoras and Empedocles. Others, however, having made determinations, while denying the existence of a void, said nothing about why there are bodies that are unconditionally light or heavy, that is, why the one lot spatially moves always upward and the other lot downward. And they made no mention either about there being some bodies that are greater in mass but lighter than smaller bodies, nor is it clear, on the basis of what has been said, how what they say will be in agreement with the things that seem to be so.

On the other hand, it is necessary for those who explain the lightness of fire by taking the cause to be its containing a larger quantity of void to be subject to pretty much the same difficulties. For while it will contain less solid and more void than other bodies, nonetheless there will be some quantity of fire in which the solid and full part exceeds the solid ones encompassed in some small quantity of earth. If they were to say that there is also an excess of void, how will they determine what is unconditionally heavy? Surely, either by its containing more solid or by its containing less void. If, then, this is what they will say, there will be some quantity of earth so small that in it there will be less solid than **309**^{b}**1** in a large quantity of fire. Similarly, if they determine this by using the void, there will be a body lighter than what is unconditionally light and always spatially moves upward, while this body is always spatially moving downward. But this is impossible; for the unconditionally light is always lighter than what has heaviness and moves downward, while what is lighter is not always light, because, among the things that have heaviness, one is said to be lighter than another—for example, water than earth.

Moreover, neither will having void stand in a proportional relation to plenum be sufficient to resolve the puzzle now under discussion. For speaking in this way will result in the same impossibility. For in a larger and a smaller quantity of fire the solid will have the same ratio to the void. But the larger quantity of fire spatially moves upward faster than the smaller one, and, conversely, in the same way a larger quantity of gold or of lead spatially moves downward faster than a smaller one. Similarly, for each of the other things that have heaviness. But this should not be the case, if indeed heavy and light are determined by this [sort of proportional relation].

It is also absurd if it is because of the void that some things spatially move upward, but the void itself does not move. But then if void naturally moves spatially upward, and plenum downward, and this is why they are respectively the cause of these spatial movements in other things, there is no need to investigate why some composite bodies are light and others heavy, but rather to say about void and plenum themselves why one is light and the other has heaviness, and further, due to what cause plenum and void do not stand apart from each other.

It is also unreasonable to make a place for the void, as if the void is not itself a sort of place. But it is necessary, if indeed the void is to move, for there to be some place belonging to it, a place from which its change [starts] and a place to which it [is directed].

In addition to these considerations, what is the cause of movement? For it is surely not the void; for it is not void alone that is moved, but solid as well.

The results are the same if one were to determine things in another way, by having smallness and largeness make one thing heavier or lighter than another, or establishing them in some other way, whatever it might be, but only assigning the same matter to all, or if more than one, a pair of contraries only.

For if there is one matter, as there is for those who compose things from triangles, there will not be unconditional heaviness or lightness. On the other hand, if there are contrary ones, as there are for those with void and plenum, there will not be for the things intermediate between the unconditionally heavy and unconditionally light ones a cause due to which one is heavier or lighter than another or than the unconditional ones.

To determine these by largeness and smallness seems more like a fabrication than the previous ones; but because it can produce differences between each of the four elements, it is better safeguarded against the foregoing puzzles. But making things have one nature, though differing in size, necessarily has the same result as for those who make them have one matter, that nothing is unconditionally light or spatially moves upward, except by being passed by other things or being squeezed out, and that many small things are heavier than a few large ones. If this is going to be the case, however, the result will be that a large quantity of air or a large quantity of water will be heavier than a small quantity of water or earth. But this is impossible.

These, then, are the things said by others, and this the way they are stated.

4.3
The Movement of Heavy and Light Bodies

Speaking for ourselves, though, our first task is one of making determinations about something that certain thinkers are most puzzled by, namely, why it is that, in accord with nature, some bodies always spatially move upward, others downward, and others

both upward and downward, and, after this, about heaviness and lightness and the coincidental affections pertaining to them, and due to what cause each comes about.

About the spatial movement of each thing toward its own place, we must make the same supposition as about the other sorts of coming to be and of change. For there are three sorts of movement (with respect to size, with respect to form, and with respect to place), and in each of these we see the change coming about from contraries to contraries or to intermediates, and not a change from what is random to what is random. Similarly, neither is a random thing capable of moving a random thing. Instead, just as what is capable of being altered and capable of being increased are distinct, so too are what is capable of altering and what is capable of increasing. In the same way, then, we must suppose about both what is capable of moving and of being moved with respect to place that a random thing is not capable of moving or being moved by a random thing.

If, then, what is capable of moving upward or downward is what is capable of making heavy or capable of making light, and what is moved is what is potentially heavy or light, the spatial movement of each body toward its own place is spatial movement toward its own form.

(This is more how one should take what the ancients said, that like spatially moves to like. For this does not result in every case; for if one were to displace the earth to where the moon is now, each of its parts would spatially move not toward the earth, but to just where it in fact is now. In general, however, when bodies that are similar and undifferentiated are moved with the same movement, this must result, that the place toward which it is natural for any one part to spatially move toward is also the place it is natural for all of it to move toward. But since place is the limit of what encompasses, and the extremity and the center encompass all the things moving upward and downward, and they become, in a way, the form of what is encompassed, it is to its like that a body moves when it moves to its own place; for the successive ones are like each other—for example, water is like air and air is like fire. And it is possible to reverse the intermediate ones, but not the extremes—for example, air is like water, water is like earth; for the relation of each higher body to the one falling below it is always that of form to matter, and this is how they relate to each other.[154]) **$310^{b}1$**

To investigate, then,[155] why fire spatially moves upward and earth downward, is the same as investigating why what is capable of being made healthy, when moved and changed insofar as it is capable of being made healthy, proceeds toward being healthy and not toward whiteness. Likewise too for all the other things capable of alteration. But also whatever is capable of being increased, when it changes insofar as it is capable of increase, proceeds not toward being healthy but toward an increased

154. When up is associated with form and down with matter ($312^{a}15–16$), earth emerges as least formed (and so closer to matter), water more formed than earth (and so closer to fire and the upward place), air yet more formed, and fire most formed.
155. Reading δὴ.

size. And it is likewise too in the case of each of them, one changes in quality, another in quantity, and, in place, light ones [proceed] upward, heavy ones downward.

The one exception is that these seem to have a starting-point of change within themselves (I mean the heavy and the light), while the others do not, but rather an external one—for example, what is capable of being made healthy and what is capable of being increased. And yet sometimes these too change of themselves, and on a small movement coming about in what is external, the one proceeds toward health, the other toward increase. And since the same thing that is capable of being made healthy is receptive of disease, if it is moved insofar as it is capable of being made healthy, it moves toward health, if it is moved insofar as it is [capable of being made] diseased, toward disease.

But the heavy and light, more than these, appear to have within themselves the starting-point, because their matter is closer to their substance. A sign of this is that spatial movement belongs to independent things, and in coming to be is the last of the movements, so that this movement would be primary with respect to substance. When, then, air comes to be from water and light from heavy, it progresses upward. And at the same time it is light, and is no longer becoming so, but in that place it is so. It is evident, then, that being potentially, going toward actuality, it is progressing to that place, that quantity, and that quality where the actualization of its quantity and quality and place lie.[156] And it is due to the same cause too that what already exists and is earth or fire moves toward its own place if there is nothing impeding it. For nourishment too, when nothing prevents it, and what is capable of being made healthy, insofar as nothing restrains it, proceed immediately. But what causes the movement is what produces it at the start, what removed the hindrance, or from which the thing rebounded, as was said in our first accounts,[157] in which we determined that none of these things moves itself.

The cause due to which each of the spatially moving bodies spatially moves, and what moving to its own place is, has now been stated.

4.4
The Differences of Heavy and Light Bodies

We have now to speak about the differences and the coincidental affections pertaining to these. First, then, let us take as determined, as evident to all, that the unconditionally heavy is what sinks below everything else, and the unconditionally light, what rises above everything else—unconditionally, I mean, looking to the kind, and to those things to which both heavy and light do not belong. For example, it is evident that any random quantity of fire spatially moves upward, if no other random

156. Reading καὶ ὅπου.
157. *Ph.* 255ᵇ13–31.

thing prevents it, and one of earth does so downward. And in the same way too a larger quantity does so faster.

But the things to which both heavy and light do belong are heavy and light in another way; for they both sink below and rise above other ones, as air and water do; for neither of these is unconditionally light or heavy; for both are lighter than earth (for any random part of either rises above it), but heavier than fire (for any part whatever of these sinks below it), while in relation to each other, water is unconditionally heavy, and air unconditionally light; for air in whatever quantity rises above water, while water in whatever quantity sinks below air.

But since of the other bodies, some have heaviness, others lightness, it is clear that in every case the cause lies in the difference of their non-composite parts; for some bodies will be light and others heavy as they happen to have more of one and less of the other of these. So it is about these that we must speak; for the other bodies follow along with the primary ones. Which is precisely, as we said,[158] what those thinkers should have done who say that heaviness is due to the plenum and lightness due to the void.

The result, then, is that the same things do not seem to be heavy or light everywhere, because of the difference of the primary parts. I mean, for example, that in air a talent of wood is heavier than a mina of lead, but in water it is lighter. The cause is that all bodies have heaviness except for fire, and lightness except for earth. Earth, then, and whatever contains the most earth, necessarily have heaviness everywhere, water everywhere except in earth, air everywhere except in water and in earth; for in its own space all have heaviness except fire, even air. A sign of this is that an inflated wineskin weighs more than an empty one. So that if something contains more air than earth or water, it may be lighter than something else in water, but heavier in air; for it does not rise above air, but it does rise above water.

That there is an unconditionally light and unconditionally heavy is evident from the following. By "unconditionally light" I mean what always spatially moves upward naturally, and by "unconditionally heavy" what always does so downward, if nothing prevents it; for there are bodies of both sorts, and it is not the case, as some people think, that all bodies have heaviness; besides other people too think that there is something heavy, that is, that always spatially moves toward the center. But in a similar way there is what is light too. For we see, as was said previously,[159] that earthen bodies sink below everything else and spatially move toward the center. But surely the center is definite. If, therefore, there is something that rises above everything else, as fire is observed to spatially move upward even in air itself, the air remaining at rest, it is clear that it spatially moves toward the extremity. So it itself cannot have any heaviness; for, if it did, it would sink below something. And if that were so, there would be something else that spatially moves toward the extremity and rises above all spatially moving things. But as things stand none appears to do so.

158. 309^{b}17–24.
159. 311^{a}19–21.

Therefore, fire has no heaviness at all, nor does earth have any lightness whatever, if indeed it sinks below all other bodies, and what sinks below spatially moves toward the center.

Moreover, that there is a center that the spatial movement of bodies having heaviness is toward, and the spatial movement of light bodies away from, is clear from many considerations.

First, no body can possibly go on spatially moving without limit. For just as nothing impossible can exist, in the same way neither can it come to be. And spatial movement is a process of coming to be from one place to another place.

Next, fire spatially moving upward, and earth and everything having heaviness spatially moving downward, are observed to do so at similar angles. So it is necessary for them to spatially move toward the center. (Whether the resulting movement is toward the center of the earth or toward that of the universe, since their centers is the same point, is for another account.[160]) But since what sinks below all bodies spatially moves toward the center, it is necessary for what rises above everything else to spatially move toward the extremity of the space in which their movement is produced; for the center is contrary to the extremity, and what is always sinking below is contrary to what is always rising above. That is why it is also reasonable that the light and the heavy are two things; for the places are also two, the center and the extremity.

But there is also a place intermediate between these, which is said to be the one in relation to the other; for the intermediate is in a way extremity and center of both.[161] This is why there is also something else, both heavy and light, such as water and air.

And we say that what encompasses pertains to form, what is encompassed to matter. And this distinction exists in every kind; for in fact in [the category] of quality as in that of quantity, there is what is more so form, and what is more so matter. And in the case of what has to do with place it is the same way: up pertains to what is defined, down pertains to matter. So in the case of the matter itself for what is heavy and light, insofar as it is potentially of the one sort, it is matter for what is heavy, insofar as it is potentially of the other sort, matter for what is light. And it is the same matter, but its being is not the same [in the two cases], as in what is capable of being made diseased and what is capable of being made healthy. For their being is not the same; which is why being diseased is not the same as being healthy either.

4.5
The Way in Which the Matter Is One

What has the relevant sort of matter, then, is light and always [spatially moves] upward, and what has the contrary sort is heavy and always [does so] downward. And what has[162] other sorts of matter than these, but ones having in relation to each other

160. 296[b]9–18.
161. Reading ἀμφοτέρων τὸ μεταξύ.
162. Reading τὰ δ'.

what these themselves have unconditionally, has both upward and downward spatial movements.[163] That is why air and water each have both lightness and heaviness, water sinks below everything except earth, and air rises above everything except fire.

But since there is only one body that rises above everything else and only one that sinks below everything else, it is necessary for there to be two others that both sink below some things and rise above others.

So it is also necessary for there to be just as many sorts of matter as of these bodies (namely, four), but in such a way that there is one matter common to all of them—especially if they come to be from each other—though its being is distinct. For there is nothing to prevent there being one or more intermediates between the contraries, as in the case of colors; for intermediate and center are said of things in many ways. **312^{b}1**

Each of the bodies having both heaviness and lightness, then, has heaviness in its own space (while earth has heaviness everywhere), but does not have lightness, except in those bodies in which it rises.

That is also why if a supporting body is removed, each spatially moves to the body next below it, air to the space of water, water to that of earth. But air will not spatially move upward into the space of fire, if the fire is done away with, except by force, just as water is drawn up when its surface becomes one [with that of air],[164] and something draws it upward faster than the water's own spatial movement downward. Nor will water spatially move into the space of air, except in the way just now stated. Earth, on the other hand, is not thus affected, because its surface is not one [with that of water]. That is why water is drawn up into a vessel heated by fire, while earth is not. And as earth does not spatially move upward, neither does fire move downward when the air supporting it is removed; for fire has no heaviness at all even in its own space, just as earth has no lightness. But the two other bodies spatially move downward when the supporting body is removed, because, while what is unconditionally heavy sinks below everything else, what is relatively heavy sinks as far as its own space or as the space of the bodies above which it rises, because of the similarity of matter.

And that it is necessary to make differences equal in number to these bodies is clear. For if there is one sort of matter for all things (for example, void or plenum, or magnitude, or triangles), either all will spatially move upward or all downward, and the other spatial movement will not exist at all. So either nothing will be unconditionally light, if everything causes a balance to incline more downward due to the greater size or number of its constituent bodies, or because there are plenums (we see this, though, and it has been proved, that in the same way as there is something that spatially moves always and everywhere downward, there is something that does so always and everywhere upward); or, if [their matter is] the void or something of

163. Reading φερόμενα.

164. As in the case of evaporation (*Mete.* 346^{b}32–33).

this sort that does so always upward, there will be nothing that does so always downward. Also, there will of course be certain intermediates that spatially move faster downward than earth does; for in a large quantity of air there will be more triangles, or solids, or small [particles]. But it is evident that not one part of air spatially moves downward. It is likewise in the case of lightness too, if one makes the superiority of lightness depend on the matter in question.

If, on the other hand, there are two sorts of matter, how will the intermediates do the things air and water do? (For example, suppose someone were to say that they are void and plenum. Fire, then, is void, because it moves upward, while earth is a plenum, because it moves downward. And air contains a preponderance of fire, water of earth.) For there will then be a quantity of water containing more fire than a small quantity of air does, and a large quantity of air containing more earth than a small quantity of water does, so that some quantity of air will have to spatially move downward faster than a small quantity of water. But this never appears to happen anywhere.

It is necessary, therefore, that just as fire in fact moves upward, because it contains something (for example, void) while the others do not, and earth moves downward, because it contains a plenum, so air moves to its own [place] and above water, because it contains something else, and water downward, because it contains something else again.

But if air and water both contained one [matter], or two matters that will both belong to each, there will be a certain quantity of each that will make water exceed a small quantity of air in [its speed of] moving upward, and air that of water in moving downward, as we have often said.

4.6
Shapes and Movements of Bodies

Shapes are not a cause of unconditional spatial movement downward or upward, but rather of making it faster or slower. And the causes due to which they do so are not difficult to see; for what makes one puzzle now is why a flat piece of iron or lead floats on water, while other smaller and less heavy ones, if they are round or elongated—a needle, for example—spatially move downward, and why it is that certain bodies float because of their smallness, as metal filings and other earthen and dust-like particles do in air.

As regards all three cases, to consider their cause to be as Democritus alleges is not correct. For he says that hot particles spatially moving upward from water hold up flat bodies that have heaviness, but let narrow ones fall through; for only a small number of these particles offer resistance to them. But this should happen more easily in the air, an objection which he himself raises. But he resolves it in a weak way; for he says

that "the surge" does not impel in [only] one direction, meaning by "the surge" the movement of the bodies spatially moving upward.

But since some continuous bodies are more easily divided and others less, and since things capable of dividing them are the same way, some more capable, others less, it is this fact that we must consider to be the cause. What is easily bounded is easily divided, and more so what is more so; and air is more like this than water, water than earth. Also, within each kind, the smaller the quantity, the more easily it is divided and dispersed. But those having breadth remain in place because of covering so large a surface, and because the large quantity is less easily dispersed. Those, on the other hand, that have contrary shapes, because of covering so small a surface, spatially move downward, because the division is easy. And this happens much more easily in air, insofar as it is more easily divided than water.

But since the heavy has a certain strength in accord with which it spatially moves downward, and continuous bodies have one for not being dispersed, these must be pitted against each other; for if the strength of the heavy one exceeds that in the continuous one for not being dispersed and divided, then it will force itself downward faster, while if it is weaker, it will float [on the surface].

Concerning heaviness and lightness, then, and the coincidental affections pertaining to these, let things be determined in this way.

ON COMING TO BE AND PASSING AWAY*

De Generatione et Corruptione

BOOK 1

1.1
Coming to Be, Passing Away, Growth, Withering, and Alteration

But concerning the coming to be and passing away of the things that by nature come to be and pass away, we must determine—alike with regard to all of them—their causes **314ª1**
and accounts. Further, concerning growth and alteration, we must determine what each is, and also whether we must suppose that the nature of alteration and of coming to be are the same, or separate, just as there is a distinction regarding their names. 5

Among the ancients, some say that what is called "unconditional coming to be" is an alteration, others that alteration and coming to be are distinct. For those who say that the universe is some one thing and make everything come to be from one thing, must of necessity say that coming to be is alteration and that what, in the strict sense, comes to be is altered. On the other hand, for those who posit more than one 10
[sort of] matter, like Empedocles, Anaxagoras, and Leucippus, they are two distinct things. And yet Anaxagoras was ignorant of the proper sense of his utterance; for he says, at any rate, that coming to be and perishing are the same as altering, but says that the elements are many, just as others also do. For Empedocles makes the 15
corporeal elements four, but in all, together with those that move them, [they] are six in number, while for Anaxagoras they are unlimited, as they are for Leucippus and Democritus. For he posits the uniform things as elements—for example, flesh, bone, marrow, and each of the others where a part is synonymous with the whole. 20
Democritus and Leucippus, by contrast, posit indivisible bodies, unlimited in number and shape, from which all the others are composed, differing in relation to each other in the ones from which they are composed and in the position and order of these. For it is evident that the followers of Anaxagoras and those of Empedocles say contrary things. For the latter says that fire, water, air, and earth are the four elements, and that 25
these—rather than flesh, bone, and the uniform things of this sort—are simple; while for the former ones, the uniform things are simple and elemental, while earth, fire, water, and air are composites; for they are a universal seedbed of the uniform things.

* Translated by C. D. C. Reeve. Text: M. Rashed, *Aristote: De la Génération et la Corruption* (Paris, 2005).

314b1 Those, on the other hand, who construct everything from one thing, must of necessity say that coming to be or passing away is an alteration; for the underlying subject always remains one and the same. And this is the sort of thing that we say alters. Those, by contrast, who posit a plurality of kinds must distinguish alteration from coming to be; for, for them, coming to be and passing away occur when things come together and undergo dissolution. That is why Empedocles in fact speaks in this way, saying that:

> Nothing that is has a nature . . .
> But rather there is only mixing and separating of things mixed.[1]

That the statement is properly in keeping with what they posit, then, is (one might almost say) clear; that is why they speak in this way. But it is necessary for them too to say that alteration is something other than coming to be, yet this is impossible according to what they do say.

That we are speaking correctly in saying this is easy to see. For just as, while the substance remains at rest, we see in it a change with respect to magnitude, which is called "growth and withering," in the same way we see alteration occurring. Nonetheless, on the basis of what is said by those who make the starting-points more than one, alteration is impossible. For the affections with respect to which we say that this occurs are the differences of the elements—I mean, for example, hot cold, white black, dry wet, soft hard, and each of the others. Just as Empedocles in fact says:

> Sun, white to see and everywhere hot . . .
> And rain everywhere dark and cold.[2]

And he determines the remaining ones in a similar way. So if it is not possible for water to have come to be from fire or earth from water, neither will it be possible for anything to have come to be black from white or hard from soft. And the same argument will also apply to the others. But it is this, as we said, that alteration consists in.

It is also evident from this that a single matter must always be supposed for contraries, whether the change is with respect to place, with respect to growth and withering, or with respect to alteration. Further, it is equally necessary that this is [the case with matter] and that alteration is; for if there is alteration, the underlying subject is also
315a1 one element and there is one matter for all the things that admit of change into each other, and if the underlying subject is one, there is alteration.

Empedocles, then, seems to contradict both the things that appear to be so and himself. For while he says that none of the elements comes to be from another, but rather that all the other things come to be from them, at the same time, when he has made the whole of nature, except strife, come together into one, he says that from

1. B8 DK.
2. B21 DK.

this one each thing again comes to be. So it is clear that it was by being separated out from some one thing by certain differences and affections that something came to be water and something else fire, just as, he says, the sun is white and hot, earth heavy and hard. If, then, these differences are subtracted (for they can be subtracted; since they came to be, at any rate), it is clearly necessary both for earth to come to be from water and water from earth, and similarly for each of the others, not only *then* but also *now*, since they change, at any rate, with respect to their affections. And, from what he has said, they can be added together as well as separated again, especially since strife and love are still fighting with each other. Which is precisely why even *at that time* they came to be from one thing; for the universe was certainly not fire *and* earth *and* water when it was one thing.

But it is also unclear whether he should posit as a starting-point the one or the many—I mean, fire, earth, and the co-ordinates of these. For insofar as the one is like the underlying matter from whose changing due to movement earth and fire come to be, the one is elemental. On the other hand, insofar as the one comes to be from composition by a coming together of the latter, and they through its dissolution, they are more elemental and prior in nature.

1.2
Unlimited Divisibility of Magnitudes

It is about both unconditional coming to be and passing away in general, then, that we must speak, saying whether it exists or does not exist and in what way, and about the other sorts of movements—for example, growth and alteration. Plato, on the other hand, investigated only coming to be and passing away, in what way they belong to things, and not all coming to be but [only] that of the elements—he said nothing about the way flesh, bones, or anything else of that sort come to be. Further, neither did he investigate alteration or growth, nor what way they belong to things. In general, no one seems to have paid anything besides superficial attention to these matters except for Democritus. By contrast, he seems to have given thought to all of them, in a way that was different from his times. For about growth none of them has determined anything, as we are saying, except what a random person might say, **$315^{b}1$** namely, that things grow by the addition of like to like, although nothing about the way this occurs. Nothing either about mixture, nor about (one might almost say) any of the others—for example, affecting and being affected, or in what way one thing affects and another is affected in natural productions. Democritus and Leucippus, however, having posited that shapes produce alteration and coming to be from these: coming to be and passing away by their aggregation and disaggregation, alteration by their order and position. But since they thought that the truth lies in what appears to be so, and the things that appear to be so are contraries and unlimited [in number], they made the shapes unlimited [in number], so that, due to changes in its

composition, the same thing seems to be contrary ways to two different people and, due to the mixing in of something small, undergoes a transposition, and, one particle being shifted, appears wholly otherwise; for *tragô[i]dia* and *trugô[i]dia* come to be from the same letters.[3]

But since it seems to pretty much everyone that coming to be and alteration are distinct, and that while some things come to be and pass away by being aggregated and disaggregated, they alter by changing their affections, it is having turned one's attention to these that one must get one's theoretical grasp on the issues. For these involve puzzles that are at once many and reasonable. For if coming to be is aggregation, many impossible things follow. Yet there are other opposing arguments on the other side, and ones not easy to resolve in a puzzle-free way, that it cannot possibly be anything else. If, alternatively, coming to be is *not* aggregation, either there is no coming to be at all or it *is* alteration; or else this [puzzle] too, difficult though it is, is necessary to try to resolve.

A starting-point, however, of all these matters is whether the beings come to be, alter, grow, and undergo the contraries of these, the primary magnitudes being indivisible, or whether there is no indivisible magnitude; for this makes the greatest difference. And, again, if there are [indivisible] magnitudes, are they bodies, as Democritus and Leucippus say, or planes, as in the *Timaeus*?[4]

This, as we have also said elsewhere,[5] is unreasonable in its own terms, namely, to resolve things no further than to planes. That is why it is more reasonable for there to be indivisible bodies. Although this too involves many unreasonable things. Nonetheless, with indivisible bodies it is possible to produce alteration and coming to be, causing a transposition in what is the same by "turning" and by "contact" and by the differences of shapes, precisely in the way Democritus does. (It is also why he says that color does not exist, for it is by turning that there is coloration.) But for those who divide things into planes this is no longer possible; for, by putting together, nothing comes to be except solids. In fact, they do not even attempt to generate any affection at all from them.

The cause of our being incapable of taking a comprehensive view of the agreed-upon facts is lack of experience. That is why those who are more at home among natural things are better able to posit the sort of starting-points that can string together a good many of these, while those who on the basis of their many [logico-linguistic] arguments do not get a theoretical grasp on the facts, but look at only a few, make their declarations too recklessly. One can see from this too how much difference there is between investigating in the way appropriate to natural science and in a logico-linguistic way; for concerning the existence of indivisible magnitudes, the latter lot

3. *Trugô[i]dia* is a rare word meaning "comedy." The idea is that the two words come from the same letters and then one particle, namely, "a," gets "shifted" when "u" gets mixed in and replaces it.

4. 52d–57d.

5. E.g., *Cael.* 299ᵃ6–11.

say that the triangle-itself will [otherwise] be many, while Democritus would appear to have been convinced of this by arguments that are proper to and appropriate to natural science. What we are saying will be clear as we go on.

For a puzzle would be involved if one were to posit that some body and magnitude is divisible at every point, and that this is possible. For what precisely will what escapes the division be? For if it is divisible at every point, and this division is possible, it could also be in the state of being divided at every point at the same time, even if it had not been divided up at the same time (and even if this latter did happen, there would be nothing impossible involved). Hence the same applies also at the mid-point and, in general too, if it is naturally divisible at every point; then, if it is [in fact] divided up, nothing impossible will have happened, since not even if it is divided at a hundred million points is there any impossibility—and yet perhaps no one would so divide it.

Since, therefore, the body is like this at every point, let it have been divided [at them]. What, then, will remain? For it cannot be any magnitude; for then there will be something undivided, but it was said to be divided at every point. But then, if there will be no body and no magnitude remaining, but there will be division, either the body will consist of points, and what it is composed of will be without magnitude, or there will be nothing remaining at all, so that it would come to be from, and be composed of, nothing, and the totality, then, would be nothing but an appearance. Similarly, even if it consists of points, there will be no quantity. For when the points were in contact and the magnitude was one and they were together, they did not make the totality any greater. For when it was divided into two or more, the totality was not greater or smaller than before, so that even if they are all put together, they will produce no magnitude. But then even if, during division, something is produced like sawdust from the body, and in this way some body is removed from the magnitude, the argument is the same: it is divisible in some way. But if what is **316^{b}1** removed is not a body but some separable form or some affection, and the magnitude consists of points or contacts affected by this, it is absurd for a magnitude to be composed of components that are not magnitudes.

Further, the points will be somewhere and they will be immovable or in movement; also, a single contact is always between two things, as there is always something beyond the contact, the division, and the point.

If, then, someone posits that any body whatever of any magnitude whatever is divisible at every point, these are the things that follow.

Further, if I had divided and had put back together the piece of wood, or anything else, it would again be equal and one. Hence the same clearly applies if I cut the wood at any point whatever. Therefore, it is at every point that it has been potentially divided. What, then, is there beyond the division? For if there is also some affection, how is it dissolved into these and how does it come to be from these? And how are these separated?

So, if indeed it is impossible for magnitudes to be composed of points or contacts, it is necessary for there to be bodies and magnitudes that are indivisible. Nonetheless, for those who posit these, no less impossible things follow. These have been investigated elsewhere.[6] But an attempt must be made to resolve them. That is why the puzzle must be stated again from the start.

That every perceptible body is divisible at every point and indivisible is no absurdity; for being divisible will belong to it potentially, while being indivisible will do so actually. But that it should be potentially divisible at every point at the same time would seem to be impossible. For if it were possible, it could also come about (not so as to be at the same time both in actuality indivisible and divided, but so as to be divided at every point). Therefore, there will be nothing remaining, and the body will have passed away into something incorporeal, and could come to be again either from points or from something that is nothing at all. And how is this possible? Yet that it *does* get divided into magnitudes that are separable, and into ones that are always smaller and smaller, and into ones that are at a distance from each other and separated, is evident. But division part by part could not go on without limit and neither can a body be divided at every point at the same time (for that is not possible), but only up to some [limit]. Therefore, it is necessary for it to contain indivisible magnitudes that are invisible—especially if coming to be and passing away are going to be by aggregation and disaggregation.

This, then, is the argument that seems to make it necessary for there to be indivisible magnitudes. And that it contains a hidden fallacy, and where it is hidden, we now explain. For since no point is contiguous to another point, there is one way in which being divisible at every point does belong to magnitudes, and another in which it does not. When this divisibility is posited, it seems that there is a point both anywhere and everywhere, so that it is necessary for the magnitude to be divided into nothing; for there is a point everywhere, so that the magnitude is composed of contacts or points. The way, however, in which divisibility does belong at every point is that anywhere at all there is one point in whichever direction, and that all points are like each; but there are not more than one [there]; for points are not successive, so that [it does not belong] at all points; for if a magnitude is divisible at the mid-point, will it also be divisible at a contiguous point? For cut is not contiguous to cut or point to point. And this cut serves as a division or a join.

So there is both disaggregation and aggregation, but neither into indivisibles and from indivisibles (for the impossibilities involved are many) nor in such a way that division has occurred at every point (for [only] if point were contiguous to point would this have been so). Instead, disaggregation is into small parts and then smaller ones, and aggregation is from smaller ones.

But it is not the case that unconditional and complete coming to be and passing away are defined by aggregation and disaggregation, as some say, while change in

6. *Ph.* 231ᵃ21–ᵇ18, *Cael.* 303ᵃ3–ᵇ8.

what is continuous is alteration. On the contrary, this is where all the mistakes are made. For unconditional coming to be and passing away do not occur by means of aggregation and disaggregation, but are when a whole changes from a *this* to a *this*. Others think that all this sort of change is alteration, but there is a difference; for within the underlying subject there is something corresponding to the account and something corresponding to the matter. When, then, the change is in these, there will be coming to be or passing away. But when it is in the affections and is coincidental, there will be alteration.

By being disaggregated and aggregated, things do become more [or less] easily capable of passing away. For the smaller raindrops are divided, the faster they become air, while if they have been aggregated, they do so more slowly. This will become clearer in what follows. For now, however, let us take this much as determined, namely, that it is impossible for coming to be to be aggregation, as some people say it is.

1.3
Unconditional Coming to Be

These things having been determined, we must first get a theoretical grasp on whether there is anything that comes to be and passes away unconditionally, or whether strictly speaking nothing does, but always it is something that comes to be and it comes to be from something [else]—I mean, for example, coming to be healthy from being sick, and sick from being healthy, or small from large and large from small, and all the others in the same way.

For if there is going to be unconditional coming to be, something would come **317^{b}1** to be from not being unconditionally, so that it would be true to say that not being belongs to some things. For non-unconditional coming to be something is from not being something (for example, from not being white or not being beautiful), while unconditional coming to be is from unconditional not being. But "unconditionally" signifies either what is primary in each category of being, or what is universal and encompasses everything. If, then, it signifies the first, substance is going to come to be from not substance. But what neither substance nor thisness belongs to, clearly none of the other categories does either—for example, quality, quantity, or place; for otherwise affections would be separable from substance. If, on the other hand, it signifies wholly not being, it will be the universal denial of everything, so that what comes to be will necessarily come to be from nothing.

The puzzles concerning these issues have been gone through and determined at greater length in other accounts.[7] But let us in a summary way now state again that in one way it is from what is not that a thing comes to be unconditionally, although

7. *Ph.* 1.6–9.

in another way it is always from what is; for what potentially is but actually is not must of necessity preexist, and it is spoken of in both ways. But even when these distinctions have been drawn, a wondrous puzzle remains, which must be gone through again, as to how unconditional coming to be is possible, whether from what is potentially a substance or in some other way. For one might raise a puzzle as to whether there is a coming to be of substance—that is, of the this—which is not [a coming to be] of the thus qualified, the thus quantified, or the where placed. And it is the same way too as regards passing away. For if a [this] something comes to be, clearly there will be potentially, but not actually, some substance from which its coming to be will [proceed] and into which what passes away necessarily changes.[8] Will, then, any of the others actually belong to this? I mean will what is only potentially a this and a being, but unconditionally is neither a this nor a being, have, for example, a quantity, a quality, or a somewhere? For if it has none, but all potentially, it follows that what in this way is not is separable, and further, what the first philosophers feared most of all has come to pass, namely, the coming to be of something from nothing preexisting. On the other hand, if being a this something or a substance is not going to belong to it, while some of the other things are going to, affections, as we said, will be separable from substance.

It is necessary, then, to study these issues as much as possible, and on what the cause is of there always being coming to be, both unconditional and partial.

318ᵃ1 But since there is one cause that we say is the starting-point of movement, and another one that is the matter, it is the latter sort of cause that must be spoken about. For the former has already been spoken about in our accounts concerning movement,[9] where we said that there is, on the one hand, what is immovable for all time and, on the other, what is always in movement. The first of these—the immovable starting-point—is work for the other and prior philosophy to discuss. Concerning the second, the one that moves the other things through being itself continuously moved, it must be determined later[10] which of the things said to be particulars is a cause of this sort. But for now let us speak about the cause posited as being of the material form, due to which passing away and coming to be never fail to occur in nature; for at the same time as this becomes clear, we will perhaps also get clear about what is now puzzling us, as to how precisely one should in fact speak too about unconditional passing away and coming to be.

Enough of a puzzle is in fact involved in what the cause is of the unbroken continuity of coming to be, if indeed what passes away disappears into what is not, and what is not is nothing; for what is not is neither a something, nor a quality, nor a quantity, nor a somewhere. If indeed, then, some one of the beings is always disappearing, why precisely has not the universe been consumed long ago and vanished,

8. Reading ἐξ ἧς ἡ γένεσις ἔσται καὶ εἰς ἣν ἀνάγκη μεταβάλλειν τὸ φθειρόμενον.
9. *Ph.* 5, 6, and 8.
10. 336ᵃ23–ᵇ12.

if, at any rate, each of the things coming to be comes to be from something limited? For of course it is not because what each comes to be from is unlimited that it does not fail to occur; for this is impossible; for nothing is actively unlimited, and is potentially so only in the direction of division, so that the only sort of coming to be that never fails to occur would be due to what comes to be always being smaller. But as things stand this is not what we see.

Is it, then, because the passing away of one thing is the coming to be of another, and the coming to be of one thing is the passing away of another, that change is necessarily unceasing? As regards the existence of the coming to be and likewise of the passing away of each of the beings, this should be thought enough of a cause.

But why precisely some things are said to come to be and pass away unconditionally and others not unconditionally must be investigated again, if indeed the same thing is the coming to be of this and the passing away of that, and the passing away of this is the coming to be of that; for this seeks some account. For we say that passing away occurs now unconditionally, and not only that *this* passes away; also that this is a case of coming to be unconditionally, and this of passing away unconditionally. On the other hand, if this comes to be something, it does not come to be unconditionally; for we say that a person who learns comes to be scientifically knowledgeable, not that he comes to be unconditionally.

We often make a distinction by saying that some things signify a this something while others do not; what is being sought is a consequence of this. For it makes a **$318^{b}1$** difference what the changing thing changes into—for example, perhaps the route that leads to fire is a coming to be unconditionally, but a passing away of something (of earth, for example), while the one to earth is a coming to be of something (but not an unconditional coming to be[11]), but an unconditional passing away (of fire, for example). Parmenides speaks of a pair like this, saying that what is and what is not are fire and earth. Whether this pair or another of the same sort is posited makes no difference; for we are seeking the way it happens, not what is being posited. And the route that leads to unconditional not being is unconditional passing away, while the one that leads to unconditional being is unconditional coming to be. Of the pair in terms of which the distinction is made, whether fire and earth or some other, one will be what is and the other what is not. This, then, is one way in which unconditional coming to be and passing away will differ from the one that is not unconditional.

Another way is by the sort of matter involved; for if the differences in the matter signify more of a this something, the matter is more of a substance, while if they signify a privation, it is more of a non-being. For example, hot is a certain [positive] predicate and a form, and cold is a privation, and earth and fire differ by these very differences.

But it seems to ordinary people that the difference is more one of being perceptible and being imperceptible; for when the change is to perceptible matter, they say that

11. Reading γένεσις δ᾽οὐχ ἁπλῶς.

it is a coming to be, when to matter that is unapparent, a passing away; for they distinguish being from non-being by what they perceive and do not perceive, just as, for example, what is scientifically knowable is [said to be] being, the unknowable [said to be] not being; for perception has the capacity of scientific knowledge. Hence, just as they think themselves to live and be in virtue of their perceiving or being capable of perception, so it is too with things. And in a way they are tracking the truth, though what they say is not itself true. Indeed, unconditional coming to be and passing away turn out one way in accord with belief and another in accord with truth; for, in accord with perception, wind and air are less a this something and a form than earth is (that is why they say that what passes away unconditionally changes into these, while coming to be occurs when there is change into something tangible, that is, into earth), while, in accord with truth, they are more so.

The cause, then, of there being unconditional coming to be that is the passing away of something, and of unconditional passing away that is the coming to be of something, has now been stated; for it is due to the matter differing, either in virtue of its being a substance or not, or of its being more a substance or not, or because of the matter from which or to which [it changes] being more perceptible in the one case and less so in the other.

But what is the cause due to which some things are said to come to be unconditionally, others only to come to be something, and not in virtue of the coming to be of one thing from another, in the way we have just now stated? For up to now we have determined only this much: why precisely, when every coming to be is the passing away of something else and every passing away the coming to be of a distinct thing, we do not in the same way attribute the coming to be and passing away to the changing things. But the puzzle that was mentioned later[12] was not the one gone through, but was precisely why what learns is not said to come to be unconditionally but to come to be scientifically knowledgeable, while what is born is said to come to be unconditionally. This, then, is determined by their categories; for some things signify a this something, some a quality, some a quantity. Those that do not signify a substance are not said to come to be unconditionally, but to come to be something.

Nevertheless, in every case, coming to be is said in accord with one of the two columns [of contraries]—for example, in substance, if it is fire, but not if it is earth, in quality, if it is scientifically knowledgeable, but not if it is lacking in scientific knowledge.

The unconditional coming to be of some things, then, but not of others, both in general and in the case of substances themselves, has now been spoken about; as has why the underlying subject is the cause, as matter, of the continuous occurrence of coming to be, namely, because it is capable of changing from contrary to contrary, and because in the case of substances the coming to be of one thing is always the passing away of another, and the passing away of one thing, the coming to be of another.

12. 318ᵃ27–35.

Moreover, there is no need to be puzzled either as to why there is coming to be when things are always passing away; for just as people speak of something unconditionally passing away when it passes into imperceptibility (that is, into what is not), similarly they say that something comes to be from what is not when it emerges from imperceptibility, whether the underlying subject is something or is not anything. So in the same way as something comes to be from what is not, it also passes away into what is not. It makes perfect sense, then, that it does not fail to occur; for coming to be is the passing away of what is not and passing away the coming to be of what is not.

But this *what unconditionally is not*, is it one of the two contraries—for example, is earth (that is, what is heavy) what is not, and fire (that is, what is light) what is—or not, but rather earth too is what is, while what is not is the matter of earth and fire alike? Also, is the matter of each of these distinct? Or, in that case, is it that they would not come to be from each other, or from contraries (for it is to these that the contraries belong, namely, fire, earth, water, air)? Or is the matter in one way the same, and in another way distinct? For the thing (whatever it is) by being which it underlies is the same, but its being is not the same.

About these issues, then, let this much be said.

1.4
Alteration

Let us now say what the difference is between coming to be and alteration, since we say that these changes are distinct from each other. Since, then, the underlying subject is one thing and the affection that is naturally said of the underlying subject is another, and there is a change of each of them, there is alteration when the underlying subject, which is perceptible, while remaining [the same], changes in its own affections, which are either contraries or intermediates (for example, the body is healthy and again sick, while remaining, at any rate, the same [body], and the bronze is round and at another time angular, while being the same [bronze]). But when a whole changes, while nothing perceptible remains as the same underlying subject, but rather is like when blood comes from the whole of the semen [changing], or air from water, or water from the whole of air, something of this sort is then a coming to be, and a passing away of the other thing, especially if the change is from something imperceptible to something perceptible, either to touch or to all the perceptual modalities—for example, when water comes to be from or passes away into air (for air is fairly imperceptible).

In the latter cases, if some affection of a contrariety remains the same in what came to be and in what passed away (for example, when water comes to be from air, if both are transparent or cold), the other thing to which it changes must not be an affection of this former one. Otherwise, the change will be an alteration. For example, the

musical human passed away, and the unmusical human came to be, but the human remains the same. If, then, musicality and unmusicality were not intrinsically affections of this latter, there would be a coming to be of the one and a passing away of the other. That is why these are affections of the human, though of unmusical human there is a coming to be and of musical human a passing away. But as things stand this is an affection of the underlying subject. That is why cases of this sort are alteration.

When, then, the change of a contrariety is with respect to quantity, there is growth and withering; when it is with respect to place, spatial movement; when with regard to an affection and a quality, alteration; but when nothing remains of which the other [resulting thing] is an affection, or, in general, a coincident, there is coming to be, and, on the other hand, passing away.

Matter in the most strict sense is the underlying subject receptive of coming to be and passing away, but in a certain way that of the other changes too, because all underlying subjects are receptive of certain contrarieties.

Concerning coming to be—whether or not it exists, and in what way it exists—and alteration, let things be determined in this way.

1.5
Growth

It remains to speak about growth, in what respect it differs from coming to be and alteration, and how each of the things that grow grows and how any one of the things that withers withers. It is necessary, then, to investigate first whether their difference from each other lies [only] in what they concern—for example, because the change is from a this to a this, that is to say, from a potential substance to an actual substance, it is coming to be; because it has to do with magnitude, growth; with affection, alteration (the latter two being a change from potential to actual of the things mentioned [namely, magnitude and affection])—or whether the mode of the change differs too; for it is evident that while what alters does not of necessity change with respect to place, and neither does what is coming to be, what grows and what withers does, but in another way than what spatially moves. For what spatially moves changes its place as a whole, while what grows does so like metal that is beaten out; for while it remains where it is, its parts change with respect to place, although not as the parts of a [revolving] sphere do; for these change within a place of the same magnitude, while the whole remains where it is, while the parts of what grows occupy an ever larger place, what withers always an ever smaller one. It is clear, then, that the change in the case of what is coming to be, what is altering, and what is growing differs not only in what it has to do with but also in its mode.

But what the change has to do with in the case of growth and in that of withering (granted that growth and withering seem to have to do with magnitude), how should it be supposed to be? Is it from something potentially a body and a magnitude, but

actually incorporeal and without magnitude, that a body and a magnitude come to be? But since this also admits of being said in two ways, in which of them does growth come to be? Is the matter from which it comes itself an intrinsically separated thing, or does it exist in another body? Or are both of these impossible? For, if it is separated, it will either occupy no space, like a point, or it will be a void or an imperceptible body. Of these, one is impossible, while the other makes it necessary for it to be in something; for what comes to be from this matter is always going to be somewhere, so that the matter too must be somewhere, either intrinsically or coincidentally. But then if it is going to be in something, if it is separated in such a way as not to belong to it either intrinsically or coincidentally, many impossibilities will follow. I mean, it would be as if water comes to be from air, not because the water is what changes, but because the matter of the air is present in the water like in a vessel. For then nothing would prevent there from being an unlimited number of matters [in it], so that they might actually come to be [from it]. Further, it is evident that air does not come to be from water in this way, as if coming out from something that persists. Therefore, it is better in every case to make the matter inseparable, as being the same and one in number, though not one in account. But then, points cannot be posited as the body's matter either, and neither can lines, due to the same cause. The matter is what points and lines are limits of, and it is something that can never exist without affections and without shape.

One thing unconditionally comes to be from another, as has been determined elsewhere, and always as a result of something actually being, either the same in form or the same in kind (for example, fire as a result of fire, or human as a result of human), or else as a result of an actuality; for a hard thing does not come to be as a result of a hard thing. But since there is also matter for corporeal substance, and this is already the matter for *this* sort [of body] (for there is no body that is common), the same one will also be matter for magnitude and affection—separable in account, but not separable in place, unless the affections too are separable.

It is evident, then, from the puzzles gone through that growth is not a change from something that potentially has magnitude, but that actually has no magnitude; for then the void would be separable, and that this is impossible has been stated previously elsewhere.[13] Further, change of *this* sort would not be special to growth but would belong to coming to be generally. For growth is the increase of a preexisting magnitude, and withering its diminution. That is why, indeed, what is growing must have some magnitude. So growth must not be regarded as being from matter without magnitude to actual magnitude; for this would instead be the coming to be of a body, not growth.

We must, then, as if undertaking the investigation from the start, take up in greater detail the question of what sort of thing growth or withering is whose causes we are seeking. It is evident, then, that when a thing grows each and every part of it has

13. *Ph.* 4.6–9.

grown, and similarly when a thing withers each and every part has become smaller, further, that a thing grows by something that is added, and withers by something that is subtracted. But it is necessary that growth be either by something incorporeal or by a body. If, then, it is by something incorporeal, there will be a separable void (but it is impossible for the matter for magnitude to be separable, as was said previously[14]), while if it is by a body, there will be two in the same place, the one that grows and the one that grows it; but this too is impossible.

But then neither is it possible to say that growth or withering comes about just as when air comes from water; for in that case the mass has become greater, but this is not in fact growth but a coming to be of the thing the change will be to, and a passing away of its contrary, though not a growth of either. Instead, either nothing grows or if [anything does] it is something that belongs jointly to both what passes away and what comes to be—for example, if body does. But the water has not grown, neither has the air; rather, the one has passed away and the other has come to be, though the body involved has grown—if indeed anything has. But this too is impossible; for one must preserve in the account the things that belong to what is growing and what is withering. And these are three in number: one, each and every part of what is growing is larger (for example, if it is flesh, of flesh); second, something is added to it; and third, what grows is preserved and remains; for while in the case of something unconditionally coming to be or passing away the thing does not remain, in those of alteration and growth or withering, what grows or alters does remain the same, although in the first the affection and in the second the magnitude does not remain the same. If, then, the change just mentioned is to be growth, it would be possible for something to grow though *nothing* was added to it or remained (and to wither though nothing has been subtracted) and what grows did not remain. But this must be preserved; for growth was posited[15] to be like this.

But someone might also raise a puzzle as to what it is that grows. Is it that to which something is added? For example, if someone's calf grows, it becomes larger, but that by which it grows, the nourishment, does not. Why is it, then, that not both have grown? For the thing that grows and the one by which it grows are both larger, just as when one mixes wine with water; for one has more of each of the two alike. Is it because the substance of the one remains, while that of the other—the nourishment—does not? [No,] since in the other case too it is what masters in the mixture that it is said to be—for example, that it is wine; for the compound mixture **321[b]1** does the work of wine but not that of water. It is the same way too in the case of alteration, if being flesh remains and the what-it-is, but an intrinsic affection that did not belong to it previously [now] belongs to it—it has altered. [Response.] But that by which it is altered, though it is sometimes not affected at all, sometimes has also been altered. [Response.] But what alters it, that is, the starting-point of the movement,

14. 320[a]27–[b]25.
15. 321[a]17–22.

is within what grows and what is altered, because the mover is in these. Since in fact what enters could sometimes become larger together with the body that has enjoyed it—for example, if having entered it became breath. But it passes away, surely, having been thus affected, and the mover is not in it.

Since the puzzles about this have been sufficiently gone through, it is also necessary to try to find a resolution of the puzzle, while preserving the fact that what grows remains and grows by something added (and withers by something subtracted), and further, that each and every perceptible point [in it] has become larger (or smaller); and that the [growing] body is not a void, nor are two magnitudes in the same place, nor does it grow by anything incorporeal. The cause must be grasped by first making two distinctions: one is that non-uniform things grow by the growth of uniform things (for each one is composed of these); the next is that flesh, bone, and each part of this sort is twofold, just as are the other things that have an in-matter form; for both the matter and the form are said to be flesh and bone.

The growth of each and every part [and what is such by] something added is possible with respect to the form, but with respect to the matter it is not possible; for it must be understood as if someone were measuring out water by the same measure; for what comes to be is always one thing and then another. And this is how the matter for flesh grows, and not by each and every part being added to, but rather some flowing out and some added to each and every part of the figure and the form. This is more clear in the case of non-uniform things—for example, a hand, because it grows proportionally; for in their case it is more clear that the form is distinct from the matter than in the case of flesh and uniform things. That is also why a corpse would seem still to have flesh and bone more than a hand and an arm. So there is a way in which each and every part of flesh grows and a way in which it does not. For with respect to the form there has been addition to each and every part, but not with respect to the matter. The whole, however, has become larger by the addition of something called "nourishment," that is, of a contrary [to flesh] changing to the same form—for example, if wet were to be added to dry, and, having been added, were to be changed and become dry; for in one way like grows by like, in another way by unlike.

One might raise a puzzle as to what sort of thing that by which something grows must be. It is evident, then, that it must be potentially that thing—for example, if it is flesh, potentially flesh. Actually, therefore, it is something else. This having passed away, then, has become flesh. Not, though, this thing intrinsically (for that would be coming to be, not growth), but rather what grows by this.[16] But what, then, is the affection of this thing by which the thing grows? Has it been mixed in it, as if one were to pour water into wine that was able to make what is mixed in it into wine, as fire takes hold of the combustible—is it in this way that the growth-producer, which

16. Suppose some nourishment N becomes flesh F_1. N cannot do this intrinsically, since it can only do it by being digested and transformed into F_1 by an animal already possessed of flesh F_2, which thereby grows by the addition of F_1.

is present in what grows (that is, in what is actually flesh), makes what is potentially flesh into actual flesh when added to it? In that case, then, [it is due to the two] being together; for if [it happens when they are] separate, it is coming to be. For one can make fire in this way, namely, by putting logs on a preexisting fire. In this way, then, it is growth, but when the logs themselves are set on fire, it is coming to be.

A quantity, taken universally, however, does not come to be any more than does an animal that is neither a human nor any other of the particular ones (as universal is here, quantity is there). Instead flesh or bone does, or hand (that is, the uniform components of these). And what is added is in fact a certain quantity of something, but not a quantity of flesh. Insofar, then, as it is potentially both together—for example, so-and-so-much flesh—there will be growth by this; for it must have become both a certain quantity and flesh. But insofar as it is potentially flesh alone, it nourishes; for this is how nourishment and growth differ in account.

This, then, is why something is nourished for as long as it is preserved, even if it withers, but is not always growing. It is also why nourishment and that by which something will grow, though they are the same, are distinct in being; for insofar as what is added is potentially so-and-so-much flesh, it is a growth-producer of flesh, but insofar as it is potentially flesh alone, it is nourishment. But this form without matter, like a pipe, is a certain in-matter capacity. And if some matter were added that is potentially a pipe, and that also has the relevant quantity potentially, these[17] [pipes to which it is added] will be bigger pipes. But if it is no longer capable of producing this [that is, the growth of pipes], but is like water continually mixed with wine, which ends up by making it watery, indeed water, then it will produce withering of the quantity. The form, though, remains.[18]

1.6
Contact

322b1 But since it is necessary first to speak about the matter and the so-called elements, saying whether there are any or not, and whether each is eternal or in some way they come to be, and if they do come to be, whether they all come to be from each other in the same way or whether one among them is primary—before this it is necessary to speak about things that are now said in an indefinite way. For all the thinkers, both those for whom the elements come to be and those for whom things come to be from them, make use of both disaggregation and aggregation and affecting and being affected.

Aggregation is mixing. But what we mean by "mixing" has not been determined in a perspicuous way. Moreover, neither alteration nor disaggregation and aggregation is

17. Reading οὗτοι.
18. Reading τὸ δ' εἶδος μένει here.

possible without something affecting and something being affected; for in fact those who posit several elements make them come to be by affecting and being affected, and for those who make them come to be from one it is necessary to mention the affecting. And in this regard Diogenes [of Apollonia] says correctly that if all things did not come from one, they would not be able to affect and be affected by each other, for example, for the hot to be cooled and for it in return to be heated; for heat and coldness do not change into each other, but rather it is clear that the underlying subject does. So things in which there is affecting and being affected necessarily have a single underlying nature. But it is not true to say that everything is of this sort, but only the ones in which there is [affecting and being affected] by each other.

But surely if we are to get a theoretical grasp on affecting and being affected and one on mixing, it is necessary to get one on contact as well; for affecting and being affected in the strict sense is not possible for things that are not in contact, and neither is mixing possible for those that are not first in a certain sort of contact. So we must determine three things; what contact is, what mixing is, and what affecting is.

Let us take the following as a starting-point. For it is necessary for the beings for which there is mixing to be capable of contact with each other, and the same holds also for those things, where, in the strict sense, one affects and the other is affected. That is why we must first speak about contact. Just as pretty much each of the other names is said of things in many ways, some homonymously, others because one or other of the two derives from a distinct prior one, this is how it is with "contact." Nonetheless, "contact" said in the strict way belongs to things that have position, and position belongs to the very ones that also have place; for even to mathematical objects contact and place are assigned equally, whether each of them exists in separation or in some other way. If, then, as was determined previously, making contact is having the extremities together, those things make contact with each other which are definite magnitudes having size and position that have their extremities together. And since whatever has a position also has a place, and the primary difference of place is up and down, and other opposites of this sort, all things that make contact with each other will have heaviness or lightness, either both or one of the two. And things of this sort are affectable and capable of affecting. So it is evident that the sorts of things that naturally make contact with each other are definite magnitudes whose extremities are together that are capable of moving and being moved by each other.

But since the mover does not [always] move the moved in the same way, but one mover moves by being itself moved, and another while being immovable, it is clear that we must speak in the same way about the affecter; for the mover is said to affect something and the affecter to move something.

Nonetheless, there is a difference and a distinction that must be made. For not every mover can affect something, if indeed we contrast the affecter with the affected, and apply this to those things whose movement is an affection—an affection being that with respect to which a thing alters, such as white and hot. In other words, moving is wider in extension than affecting is.

But this point, at all events, is evident, namely, that there is a way in which the movers will make contact with the things they move and a way in which they will not. Still, the universal definition of making contact applies to things having position, one of which is capable of causing movement and the other capable of being moved; while [that of making contact] with each other applies to things capable of being moved and capable of moving, between which there is affecting and being affected. For the most part, to be sure, what makes contact makes contact with something that makes contact with it; for in fact pretty much all the movers we meet move by being moved, and in these cases it is necessary and evident that what makes contact makes contact with something that makes contact with it. But it is possible, as we sometimes say, for the mover alone to make contact with the moved, and for what makes contact not to be made contact with by what it makes contact with (but because things of the same kind move by being moved, it seems necessary for what makes contact to be made contact with). So if something moves while being immovable, it will make contact with the thing moved, but nothing will make contact with it; for we sometimes say that a person who grieves us "touches" us, but we do not touch him.

As regards contact among natural objects, then, let it be determined in this way.

1.7
Affecting and Being Affected (1)

323b1 The next thing that must be spoken about is affecting and being affected; for the accounts we have received from earlier thinkers are contrary to each other. For most are unanimous in saying this, namely, that like is in every case unaffectable by like, since one is no more capable of affecting or of being affected than the other (for all the same [affections] belong equally to like things), while it is unlike things and different ones that naturally affect and are affected by each other; for even when a smaller fire is caused to pass away by a much greater one, it is so affected, they say, because of the contrariety; for much is contrary to little. Democritus, on the other hand, stated a view contrary to the others and special to himself alone; for he says that the affecter and the affected are the same and like; for he does not allow things that are distinct and different to be affected by each other; on the contrary, even if things that are distinct do in some way affect each other, it is not insofar as they are distinct but insofar as they have the same something that this happens to them.

The things said, then, are these. And those who speak in this way seem to appear to be saying contrary things. And the cause of their speaking in contrary ways is that while it is necessary to get a theoretical grasp on the whole, each side succeeds in stating [only] a part of it. For that like—that is, what is entirely and in every respect undifferentiated—is not affected in any way by like is reasonable. (For why will one be more capable of affecting than the other? And if like is affectable by like, it is also affectable by itself; and yet if things are like that, there would be nothing incapable

of passing away or immovable, if indeed like insofar as it is like is capable of affecting things; for everything will move itself.) And [that] what is entirely distinct and in no way the same [is not affected in any way] is likewise reasonable. (For whiteness could not be affected in any way by a line, or a line by whiteness, except coincidentally—for example, if the line were coincidentally white or black; for things that are neither contraries nor composed of contraries could not displace each other[19] from their own nature.)

But since no random thing is naturally disposed to be affected and to affect, but rather things that have a contrariety or are contraries, it is necessary for the affecter and the affected to be like—in fact, the same—in kind, but unlike and contrary in form; for it is natural for a body to be affected by a body, flavor by flavor, color by color, and, in general, what is the same in kind by what is the same in kind. The **324^{a}1** cause of this is that all contraries are in the same kind, and it is contraries that affect and are affected by each other. So it is necessary for the affecter and the affected to be in one way the same, and in another way distinct and unlike each other. And since the affected and the affecter are the same and alike in kind, but unlike in form, and contraries are things of this sort, it is evident that contraries and intermediates are affectable by and capable of affecting each other; for it is, in general, in these that passing away and coming to be reside.

That is why it is reasonable too for fire to heat and for cold to cool, and why, in general, the thing capable of affecting makes the affected one like itself; for the affecter and the affected are contraries and coming to be is to the contrary thing. So it is necessary for the affected to change to the affecter; for this is the way coming to be will be to the contrary thing. And it is also in accord with reason, then, that both sides, though not saying the same things, touched on the nature [of the phenomenon] in a similar way. For sometimes we say that the underlying subject is affected (for example, we say that a human being comes to be cured, heated, and cooled, and other things in the same way), but sometimes we say that what is cold comes to be heated and what is ill cured. And both are true. It is the same way in the case of the affecter; for sometimes we say that a human being heats, and sometimes that what is hot does; for there is a way in which matter is affected, and a way in which the contrary is. Those, then, who looked to the former thought that the affecter and the affected must possess the same something, while the others looked to the latter and thought the contrary.

The same account must be assumed to apply to affecting and being affected, just as to being moved and moving; for something is also said to be a mover in two ways; for that in which the starting-point of movement is present seems to move things (for the starting-point is primary among the causes), and again the last in relation to the moved and the [thing's] coming to be. Likewise with affecter; for we also say both that a doctor cures and that wine does. In the case of movement nothing prevents

19. Reading ἄλληλα.

the first mover from being immovable; in some cases this is even necessary; but the last is always a moved mover. And in the case of affection, while the first [affecter] is unaffectable, the last is also itself affected; for things that do not have the same matter affect while being unaffectable, for example, the craft of medicine; for this produces health but is not at all affected by what is being cured, while the food affects and is itself somehow affected; for it is heated, cooled, or affected in some other way at the same time as it affects. The craft of medicine, indeed, serves as starting-point, while the food serves as the last thing and the one making contact. So things capable of affecting that do not have their shape [or form] in matter are unaffectable, while those that do have it in matter are affectable. For the matter, we say, is alike—(one might almost say) is the same—for either of the two opposites, being, as it were, the kind, and something capable of being hot is necessarily heated if what is capable of heating is present and comes near. That is why, as has just been said, some things capable of affecting are unaffectable while others are affectable. And it is the same way in the case of things capable of affecting as in the case of movement; for there the first mover is unmoved, and in the case of the affecters, the first is unaffectable.

But the affecter is a cause as the starting-point from which the movement comes, while the for-the-sake-of-which is not capable of affecting. That is why health is not capable of affecting, except by metaphorical transference; for when in fact the affecter is present what is affected comes to be something, but when states are present it is not any longer becoming something, but already *is*, and forms and ends are certain states, while matter, insofar as it is matter, is affectable. To be sure, fire has the hot in its matter. But if hot were to exist separated, it would not be affected at all. It is perhaps impossible for this to be separated, but if there were such things, what was said would be true of them.

Let, then, what affecting and being affected is, to what things they belong, and why and how, be determined in this way.

1.8
Affecting and Being Affected (2)

But let us speak again about how it is possible for this to happen. It seems to some people that each thing is affected when the last affecter—the affecter in the strictest way—enters in through some sort of "pores," and they say that it is in this way that we see and hear, and that all the other perceptual modalities perceive things. Further, they say that things are seen through air, water, and transparent bodies because they have ducts, invisible because of their smallness, but densely aligned in columns, and the more transparent the body, the more it has.

Some people, then, determined certain cases in this way, just as Empedocles also did—not only cases of affecting and being affected, but also mixing, which they say occurs between bodies whose ducts match each other. Leucippus and Democritus,

however, made the most methodical determinations about all [these] things, having **325ª1**
made a starting-point that is in accord with nature, precisely as nature is. For some of
the ancient philosophers believed that being is of necessity one and immovable; for
the void is a non-being, and moving would be impossible if there is not a separated
void; nor, again, would there be many things if there is nothing dividing them. And 5
to this point it makes no difference whether someone thinks that the totality is not
continuous, but making contact while being divided, rather than claiming that there
are many things, not one, and a void. For if it is divisible at every contact point,
there is no one, so that there is no many either, but rather the whole is a void. But if
it is divisible at one point but not at another, it has come to seem like some sort of
fabrication; for up to what quantity, and why, is one part of the whole this way—that 10
is, a plenum—and another part divided? Further, it is equally necessary [on this view]
for there not to be movement. On the basis of these arguments, then, overstepping
and disregarding perception, on the supposition that they must follow reason, they
say that the totality is one and immovable, and some that it is unlimited; for the limit
would be a limit next to the void. These people, then, in this way and due to these 15
causes proclaimed their "truth."

But since in view of the arguments these things do seem to follow, but in view of
the facts to believe them without more ado is much the same as mania (for no one suf-
fering a manic attack degenerates to the extent of believing that fire and ice are one;
rather, it is only beautiful things and those that appear so because of intimacy, that
to some, because of their mania, seem not to differ); Leucippus, for his part, thought
he had accounts that, saying things in agreement with perception, did not do away
either with coming to be and passing away or movement or with the plurality of the
beings. Having agreed on these points with the things that appear to be so, and with 25
those that establish the one in supposing that there would be no movement without
a void, that the void is a non-being, and that no part of being is a non-being, he says
that being, in the strictest sense,[20] is being that is a total plenum, but that what is like
this is not one, but unlimited in number, and invisible because of the smallness of the
masses. These things spatially move in the void (for there is void), and their coming 30
together produces coming to be, their dissolution passing away. And they affect and
are affected to the extent that they happen to be in contact (for, in that respect, they
are not one), and when they are put together and interwoven there is coming to be.
From what is truly one, on the other hand, a multiplicity could not have come to
be, nor from what is truly many could one have; on the contrary, this is impossible. 35
However, just as Empedocles and some of the others say that things are affected
through ducts, so Leucippus says that all alteration and all being affected come about **325ᵇ1**
in this way: dissolution and passing away because of the void, and likewise growth,
by other things slipping in.

20. Reading κυρίως ὄν.

For Empedocles too it is pretty much necessary to speak just as Leucippus also does; for he must say that there are certain solids, which, however, are indivisible, unless there are continuous ducts at every point. But this is impossible; for then there will be nothing solid besides the ducts, but all of it will be void. It is necessary, therefore, for things that are making contact to be indivisible, while the intermediates between them are voids, and these he says are *poroi*. This is the way Leucippus too speaks about affecting and being affected.

These, then, are pretty much the ways these [atomists] spoke about some things affecting and others being affected. And where they are concerned, it is clear what they say, and it is evident that it follows pretty much in agreement with the assumptions they employ. With the others, it is less so—for example, in the case of Empedocles it is not clear in what way there will be passing away and alteration. For to the others the primary bodies are indivisible, differing only in figure—from which primary ones [the other things] are composed and into which, as ultimate ones, they are dissolved. In the case of Empedocles, by contrast, it is clear that the other things have coming to be and passing away down to the elements, but about these elements themselves, heaping up a magnitude, it is neither clear how they come to be and pass away nor is it possible for him to tell us, unless he says that there is an element of fire as well, and likewise of all the others, as Plato wrote in the *Timaeus*.

For the latter is to this extent different from the way stated by Leucippus, namely, that while he says that the indivisibles are solids, Plato says that they are planes, and that while for him each of the indivisible solids is determined by [one of] an unlimited number of figures, for Plato they are limited, while both say that they are indivisible and are determined by figures.[21] From these indivisibles, then, we get comings to be and disaggregations. But for Leucippus there would be two ways, because of the void and because of contact (for it is with respect to this that each is divided), while for Plato it is by contact only; for he says that there is no void.[22]

We have also spoken about the indivisible planes in previous accounts.[23] As regards the indivisible solids, although getting a full theoretical grasp on what follows from them is something we must put aside for the moment, by way of a short digression we may say that it is necessary for each of the indivisibles to be unaffectable (for it is not possible to be affected except because of the void) and incapable of producing any affection [in anything else]; for it cannot be either cold or hard. And yet this, at any rate, is impossible, to assign hot only to the spherical figure; for then it is necessary for its contrary, cold, to belong to some other figure. And it would also be absurd to suppose if they possess these—I mean hot and cold—that they will not possess heaviness and lightness and hardness and softness. And yet Democritus says that each of the indivisibles is heavier, at any rate, in accord with the excess [of size], so that it

21. *Ti.* 52d–57d.
22. *Ti.* 58a.
23. *Cael.* 298ᵇ33–300ᵃ19, 306ᵃ1–306ᵇ2.

is clear that it is also hotter [in accord with the excess of size]. But if they are like this, it is impossible for them not to be affected by each other—for example, the slightly cold by the far exceeding hot. Moreover, if hard and soft [belong], well, something is said to be soft because it is affected by something; for what is capable of being pressed in is soft.

Moreover, it is absurd both if nothing belongs to them except shape alone, and, if something does belong, for it to be one thing only—for example, hard in one case, hot in another; for then there would not be some one nature belonging to these things. It is equally impossible too if several belong to one; for since it is indivisible, it has its affections in the same place. So that if it is affected, where it is[, for example,] cooled,[24] there it will affect or be affected in some other way as well. And it is the same way in the case of the other affections; for this consequence will follow in the same way both for those who say that the indivisibles are solids and for those who say that they are planes; for they cannot come to be either rarer or denser, because there is no void within the indivisibles.

Further, it is absurd too for small things to be indivisible, but not large ones; for as things stand it is reasonable for large ones to break up rather than small ones; for the former—namely, the large ones—more easily come apart, since they collide with many things. But why should indivisibility in general belong to small things rather than to large ones?

Further, is there one nature for all these solids, or do some differ from others, as would be so if some were fiery in their mass, others earthen? For if there is one nature for all, what separates them? Or else why, when they make contact, do they not become one, as a raindrop does when it makes contact with a raindrop? For the one behind is no different from the one in front. On the other hand, if they are distinct, of what sorts are they? And it is clear that these must be posited as starting-points and causes of the things resulting from them, rather than the shapes.

Further, if they were different in nature, they would both affect and be affected on **326**^{b}**1** making contact with each other.

Further, what is their mover? For if it is a distinct thing, they will be affectable. On the other hand, if each moves itself, either it will be divisible (with respect to one part a mover, with respect to another a moved) or contraries will belong to it with respect to the same part, and its matter will be not only one in number but also potentially.

As for those who say that affections come about because of movement through ducts, even if the ducts are total plenums, the ducts are superfluous; for if this is how the totality is affected in some way, even if it had no ducts but were itself continuous, it would be affected in the same way.

Further, how is it possible for seeing through a medium to happen in the way they say?[25] For it is not possible to pass through the transparent medium either at the

24. Reading ἢπερ ψύχεται.
25. Empedocles B84 DK (= *Sens.* 437^{b}26–438^{a}2), Plato, *Timaeus* 45b–46c.

points of contact or through the ducts, if each of these ducts is a plenum. How will it differ, then, from what does not have ducts? For all of it will be similarly plenums. But even if these ducts are voids, though it is necessary for them to have [other] bodies in them, the same thing will again result. And if they are of such a magnitude as to receive no body, it is ridiculous to think that what is small is a void, but not what is large, whatever its size—that is, to think that "void" means something other than "space for body," so that it is clear that for every body there will be a void of equal mass.

In general, then, to posit ducts is superfluous; for if nothing can affect anything by making contact with it, neither will it affect it by passing through its ducts. On the other hand, if it can do so by making contact, then—even if there are no ducts—some things will be affected and others will affect them, provided they are naturally adapted in this way to each other.

That speaking in this way about ducts, as some have supposed they must, is either false or pointless, is evident from these considerations; for if bodies are divisible at every point, it is ridiculous to posit ducts; for where they are divisible, they are capable of being separated.

1.9
Affecting and Being Affected (3): Potentially versus Actually

In what way being a cause of coming to be [such-and-such] and affecting and being affected belong to the beings, we state by taking for granted an often-mentioned starting-point; for if, on the one hand, there is what is potentially such-and-such and, on the other hand, what is actually such-and-such, it is natural for [what is affected] to be affected not at one point and not at another, but rather at all points, to the extent that it is such-and-such, though to a lesser or greater extent insofar as it is more or less such-and-such. And one would more properly speak about ducts in this connection as veins of affectability, just like [veins of ores] stretching continuously in mines.

327ᵃ1 Certainly, when grown together and one, each thing is unaffectable. Likewise too when things are making contact neither with each other nor with other things that are naturally affecting and affected. I mean, for example, that fire heats not only when making contact with things but also when at a distance from them; for the fire heats the air, and the air—being naturally affecting and affected—heats the body.

As for thinking that a thing is affected in some part but not in another, having drawn distinctions at the start,[26] this is what must be said. For if a magnitude is not divisible at every point, but there is a body or a plane that is indivisible, it would not be affectable at every point, but neither would any magnitude be continuous. On the

26. 316ᵃ14–317ᵃ17.

other hand, if this is false and all body is divisible, it makes no difference whether it was divided and is making contact or it is divisible; for if it is capable of being disaggregated at the contact points, as some people say, even if it is not yet divided, it will be divided; for it is possible for it to be divided; for nothing impossible results.

In general, it is absurd for it to be only in this way, namely, by bodies being split, that anything comes to be [such-and-such]; for this account does away with alteration, while we see that the same body, while being continuous, is at one time liquid and at another time solidified, and being affected in this way not due to division and composition, or "turning" and "making contact," as Democritus says; for it has become solid from liquid without any change of order or position in its nature, nor does it now have hard and solidified particles, indivisible in mass—on the contrary, in the same way as it was liquid throughout, it is now hard and solidified throughout.

Further, neither is it possible for there to be growth and withering; for not every part whatever will have become larger, if indeed [the change happening] is addition, and the totality will not have changed either by mixing with something or by having changed intrinsically.

One must determine in this way, then, that there is a cause of coming to be [such-and-such] and affecting, coming to be [such-and-such] and being affected by each other, and in what way they are possible, and in what way some say they are, although it is not a possible one.

1.10
Mixing

It remains to get a theoretical grasp on mixing in accord with the same mode of methodical inquiry; for this was the third of the things we proposed at the start.[27] We must investigate what mixing is, what it is to be mixable, and to which sort of beings it belongs, and in what way, and further, whether mixing exists, or whether this is false; for some people say that it is impossible for one thing to be mixed with another; for if the things that have been mixed still exist and have not been altered, they are no more mixed now, they say, than previously, but are in a similar state; but **$327^{b}1$** if one of the two has passed away, they have not been mixed, but one exists and the other does not, while mixing is of two things in a similar state; and it is the same way even if when both of the things have come together, each of the things being mixed passes away; for things that have no being at all are not mixed. This argument, then, seems to be seeking to determine in what respect mixing differs from coming to be and passing away, and in what respect what is mixable differs from what can come to be and pass away; for clearly it must differ, if indeed it exists. So once these things are evident, the puzzles would be resolved.

27. $322^{b}25–26$.

We do not say that wood has been mixed with fire, nor that it is being mixed when it burns, either itself with its very own parts or with the fire. On the contrary, we say that the fire comes to be and that the wood passes away. In the same way, we do not say that nourishment is mixed with the body, or that the shape is mixed with the wax when it shapes its mass. Nor can the body and white—nor, in general, affections and states—be mixed in the things that have them; for they are seen to be preserved. But then neither can white and scientific knowledge be mixed, nor any other of the non-separables. Indeed this is what those who say[28] that everything at one time was together and mixed say incorrectly; for not everything is mixable with everything; on the contrary, each of the things that have been mixed must preexist separately; but no affection is separable.

But since some beings are potentially and others actually, it is possible for things that have been mixed in a certain way to be and not be, with what comes to be from them actually being distinct, and each of the very things that existed before being mixed still potentially being, and not having passed away; for this is the puzzle that the previous argument raised, and it is evident that things that are mixed come together from having been previously separate, and are capable of being separated again. So they neither actually remain, like the body and white, nor do they—either or both—pass away; for their capacity [or potential] is preserved. That is why this [puzzle] may be set aside.

However, a puzzle connected to this must be analyzed, as to whether mixing is something relative to perception. For when the things that are mixed have been divided up so small and have been put next to each other in such a way that each is not clear to perception, have they, then, been mixed, or is it not so, but rather that any part whatever of one is next to some part of the other? It is in the first way that it is said, for example, that grains of barley are mixed with grains of wheat, when any grain whatever of one is put next to some grain of the other. But if all body is divisible, if indeed a body that can be mixed with another is uniform, any part whatever of one must come to be next to some part of the other.

But since it is impossible for a body to be divisible into smallest particles, and since composition is not the same as mixing but distinct from it, it is clear that one must not say *either* that the things are mixed, if they are preserved at the level of small particles—for this will be composition and not blending or mixing, nor will the part have the same account as the whole, while we say that, if indeed they have been mixed, the mixture is uniform, and that just as a part of water is water, so it is too for what has been blended; however, if mixing were just composition at the level of small particles, none of these things will follow, but there will only be things that are mixed relative to perception, and the same thing will be mixed to one person whose sight is not sharp, while to Lynceus nothing will be mixed—*or*, if they are so divided, that

28. E.g., Anaxagoras.

any part whatever [of one] is next to some part [of the other], for it is impossible for them to be divided in this way.

Either mixing does not exist, then, or it is necessary to state once again in what way it can possibly come about. There certainly are, we say, some beings that are capable of affecting and others affectable by them. Moreover, some—namely, those that have the same matter—convert, that is, are capable of affecting each other and of being affected by each other. Other things, by contrast, though they affect, are unaffectable, namely, those that do not have the same matter. Of these, then, there is no mixing. That is why neither the craft of medicine nor health produces health by mixing with bodies.

But among things that are capable of affecting and of being affected and are easy to divide, when many of these are put together with few, or large with small, this does not produce mixing, but rather growth of the mastering one; for the other changes into the mastering one, which is why a drop of wine does not mix with ten thousand *choes* of water; for its form dissolves and changes to the totality of the water. But when the two are more or less equalized in capacity, then each of them changes from its own nature toward the mastering one, although it does not become the other, but something intermediate and common. It is evident, then, that the mixable are the affecters that have a contrariety; for it is these indeed that are affectable by each other.

Also, small particles put next to small ones are more mixable; for these more easily and more quickly change each other, while a large one, even under the influence of a large one, takes much time to accomplish this. That is why, of the things that are divisible and affectable, the easily bounded ones are mixable (for they divide easily into small particles; for this is what it is to be easily bounded). For example, the liquids are the most mixable of the bodies; for of the divisible things, what is liquid is most easily bounded, provided it is not viscous; for viscous ones, it is true, merely make the mass greater in volume and larger.

But when only one of the two [things being mixed] is affectable—or is extremely so, while the other is altogether slightly so—the mixture of both is either not at all, or [only] a little, greater [in volume]—which is precisely what happens with tin and bronze. For some of the beings are hesitant with each other and play a double game; for they appear in a way as both slightly mixed and in a way as one of the two being recipient and the other form. And this is precisely what happens in the case of these; for the tin, like some affection of the bronze that is without matter [of its own], pretty much vanishes after being all mixed, giving its color only. And the same thing happens in other cases.

It is evident, therefore, from what has been said that mixing exists, what it is, and what causes it, and also what sorts of beings are mixable, since indeed they are the sorts of things that are affectable by each other, easily bounded, and easily divided; for it is neither necessary for these to pass away having been mixed, nor for them to be unconditionally still the same, nor for the mixing of them to be composition, nor to be in relation to perception. On the contrary, something is mixable that is easily

bounded, and is capable of being affected and of affecting, and is mixable with a thing that is of this sort (for what is mixable is so in relation to a homonym), and mixing is the unification of mixable things when they have been altered.

BOOK 2

2.1
The Elements of Bodies (Earth, Water, Air, Fire) and Their Matter

We have spoken about what way mixing, contact, affecting, and being affected belong to things that in accord with nature are subject to change, and further, about unconditional coming to be and passing away, in what way they happen, and to what, and due to what cause. Similarly, we have spoken about alteration, what alteration is, and how it differs from these. It remains to get a theoretical grasp on the so-called elements of bodies. For coming to be and passing away in the case of all substances that are by nature composite do not occur without the perceptible bodies.

Of these, the underlying matter is said by some people to be one, supposing it to be air or fire or something intermediate between these that is a body and separable. But **329ᵃ1** others say that it is more than one, some saying fire and earth, others these and air as a third, others these and water as a fourth, as Empedocles did. From the aggregation and disaggregation or alteration of these, the coming to be and passing away in things result.

Let it be agreed that the primary things are correctly said to be starting-points and elements, the ones from whose changing, whether by aggregation and disaggregation or another [sort of] change, coming to be and passing away result. But those, on the one hand, who posit a single matter beyond these, and it corporeal and separable, are making an error; for it is impossible for this perceptible body to exist without a contrariety; for it is necessary for this unlimited, which some say[29] is the starting-point, to be either light or heavy or cold or hot.

And the way things are written in the *Timaeus*[30] has nothing definite about it; for [Plato] does not state perspicuously whether the all-receptive is separated from the elements, nor does he make any use of it when he says that it is a sort of underlying subject that is prior to the so-called elements, as gold is to works in gold (and yet this, said in this way, is not stated correctly: for the things of which there is alteration, it is this way, but for those of which there is coming to be and passing away, it is impossible to call something that from which it has come to be, and yet he says that by far the truest thing to say is that each of them is gold); on the other hand, he takes the

29. In particular, Anaximander.
30. 50b–c, 53c–57d, 49a.

resolution of the elements, which are solids, to extend as far as to planes, though it is impossible for planes to be the "wet nurse" and the primary matter.

For our part, we say that although there is a sort of matter for the perceptible bodies, it is not separable but always goes along with a contrariety, and from this the so-called elements come to be. A more exact determination about these has been made elsewhere.[31] Nonetheless, since this is indeed the way that the primary bodies come from matter, we must make a determination about these also, thinking the matter, though inseparable, to be a primary starting-point, underlying the contraries; for neither is hot matter for cold, nor it for hot, but rather the underlying subject is matter for both. So first there is the starting-point for what is potentially a perceptible body; second, the contrarieties (I mean, for example, hot and cold); and only then, third, fire, water, and things of that sort; for these do change into each other, and it is not the way Empedocles and others say (for then there would be no alteration), while **$329^{b}1$** the contrarieties do not change. But nonetheless, even so we must state what sort and how many of them are the starting-points of body; for the others assume and make use of them, but say nothing about why they are these or this many.

2.2
The Primary Contrarieties: Hot and Cold, Dry and Wet

Since what we are seeking are the starting-points of perceptible body, that is, of tangible body, and a tangible body is that for which touch is the perceptual modality, it is evident that not all contrarieties produce forms and starting points of body, but only those in accord with touch; for it is in accord with a contrariety that they differ, and [specifically] in accord with a tangible contrariety. That is why neither whiteness and blackness, sweetness and bitterness, nor (similarly) any of the other perceptible contrarieties [besides the tangible ones] produces an element. And yet sight is prior to touch, so that its subject matter too is prior; but it is not an affection of tangible body insofar as it is tangible, but rather is in accord with something else, even if it happens to be prior in nature. It is among the tangible affections themselves, then, that one must distinguish which ones are primary differences and contrarieties.

The contrarieties that are in accord with touch are these: hot cold, dry wet, heavy light, hard soft, viscous brittle, rough smooth, coarse-grained fine-grained. Of these, heavy and light are neither capable of affecting nor of being affected; for they are not said of things in virtue of their affecting something else or being affected by something else. The elements, though, must be capable of affecting and being affected by each other; for they mix and change into each other. Hot and cold, by contrast, and wet and dry are said of things, the one lot being capable of affecting, the other capable of being affected; for hot is what aggregates things of the same kind (for the

31. *Ph.* 1.6–9, *Cael.* 3–4.

disaggregating, which is precisely what they say fire does, is the aggregating of things of the same kind; for this results in removing what is alien) and cold is what brings together and aggregates alike things of the same kind and things not of the same kind. Wet is what is not bounded by any defining mark proper to it, though it is easily bounded [by other things]; dry is what is easily bounded by a defining mark proper to it, though difficult [for other things] to bound.

And the fine-grained and coarse-grained, viscous and brittle, hard and soft, and the other differences are derived from these; for since being capable of filling things belongs to the wet, because it does not have boundaries but is easily bounded, and follows along with what it makes contact with, and the fine-grained is capable of filling things (for its particles are fine, and what has small particles is capable of filling things; for whole makes contact with whole; and the fine-grained is most of all like this), it is evident that the fine-grained belongs to the wet, while the coarse-grained belongs to the dry. Again, the viscous belongs to the wet (because the viscous is the wet affected in some way, like olive oil), while the brittle belongs to the dry; for the completely dry is brittle—so that it has been solidified because of lack of liquid. Further, the soft belongs to the wet (for what can be pressed into itself and does not move to another place, which is precisely what the wet does, is soft; that is why it is also the case that the wet is not soft, but the soft does belong to the wet) and the hard to the dry; for what is solidified is hard and what is solidified is dry.

Things are said to be dry and wet in many ways; for both wet and moist are opposed to dry, and, in turn, both dry and solid are opposed to wet; but all these belong to the wet and the dry said in the primary way. For since dry is opposed to moist, and moist is what has alien liquid on its surface, while soaked is what has it to its depths, and dry is what is deprived of it, it is evident that moist will belong to the wet, and the dry that is opposed to it to what is dry in the primary way. Again, wet and solid are opposed in the same way; for wet is what has its own liquid down to its depths (while soaked is what has alien liquid down to its depths), and solid is what is deprived of this, so that these too belong, the one to the dry, the other to the wet.

It is clear, therefore, that all the other differences are led back to the primary four, while these can no longer be led back to fewer ones; for neither is the hot precisely wet or precisely dry, nor is the wet precisely hot or precisely cold, nor do the cold and the dry fall under each other or under the hot and the wet. So necessarily there are these four.

2.3
The Contrarieties and the Elements

Since the elements are four in number, and of the four the pairings are six, and contraries do not naturally pair (for it is impossible for the same thing to be hot and cold, or, again, wet and dry), it is evident that the pairings of the elements will be four in number: hot and dry, hot and wet; and, again, cold and wet and cold and dry.

And these follow along, in accord with reason, with the apparently simple bodies: **330^{b}1**
fire, air, water, and earth; for fire is hot and dry, air hot and wet (for air is like vapor),
water cold and wet, and earth cold and dry, so that the differences are allocated to the 5
primary bodies in a reasonable way, and the number of these is in accord with reason.

For of all those who make the simple bodies elements, some make them one, some two, some three, some four. The result for those who say that there is one only, and then generate the others by condensation and rarefaction, is to make the starting-points 10
two: the rare and the dense, or the hot and the cold; for these are what play the role of handicraftsmen, while the one underlies them as matter. Those who make them two right from the start, as Parmenides does with fire and earth, make the intermediates—for example, air and water—mixtures of these. And it is the same way too for those who 15
speak of three, as Plato does in the divisions;[32] for he makes the middle a mixture. And those who make them two and those who make them three are pretty much saying the same thing, except that the former divide the intermediate in two, while the latter make it one only. But some say there are four right from the start, as Empedocles does—but he in fact leads them back to two; for he opposes all the others to fire. 20

Fire, however, and air and each of the others that have been mentioned are not simple, but mixed. The simple ones are like these, but not the same as them—for example, if something is like fire, it is fire-form, not fire, and if like air, it is air-form, and likewise in the other cases. Fire is excess of hotness, just as ice is of coldness. 25
And solidification and boiling are excesses of a sort, the one of coldness, the other of hotness. If, then, ice is the solidification of wet and cold, fire will be the boiling of dry and hot. That is why nothing comes to be either from ice or from fire.

Since the simple bodies are four in number, two of each [pair] belong to each of 30
the two places[33] (fire and air belong to what spatially moves toward the limit, earth and water to what spatially moves toward the center). And earth and fire are the extremes and the purest, while water and air are intermediates and more mixed. And two of them are contrary to the other two, for to fire water is contrary, and to air **331^{a}1**
earth; for they are composed of the contrary affections. Nonetheless, being four in number, each is unconditionally one: earth is dry more than cold, water cold more than wet, air wet more than hot, and fire hot more than dry. 5

2.4
The Change of the Elements into Each Other

But since it has been determined previously[34] that coming to be for the simple bodies is from each other, and at the same time too it is evident from perception that they come to be (for otherwise there would be no alteration; for alteration is with respect

32. *Timaeus* 35a–37d.
33. Reading τόπων.
34. *Cael.* 3.6.

to the affections of tangible things), we must speak about what way they change into each other, and whether every one can come to be from every one or whether some can but others cannot.

That all do naturally change into each other is evident; for coming to be is to contraries and from contraries, and the elements all have a contrariety in relation to each other due to their differences being contraries; for some both differences are contraries, for example, fire and water (for the one is dry and hot, the other wet and cold), for others only one is, for example, air and water (for the one is wet and hot, the other wet and cold). So universally, then, it is evident that all naturally come to be from all, and it is not difficult to see immediately with respect to each particular one in what way this occurs; for while all will come to be from all, they will differ with respect to faster and slower and with respect to easier and more difficult. For those that have tokens in relation to each other, the change is fast, and for those that do not have them, slow, because it is easier for one thing to change than for many. For example, from fire there will be air when one of the two [differences] changes (for the former was hot and dry, while the latter is hot and wet, so that if the dry is mastered by the wet, it will be air). Again, from air there will be water, if the hot is mastered by the cold (for the former was hot and wet, while the latter is cold and wet, so that if the hot changes, it will be water). And in the same way from water earth and from earth fire; for both have tokens in relation to each other; for water is wet and cold, while earth is cold and dry, so that when the wet is mastered, it will be earth. And again since fire is dry and hot, while earth is cold and dry, if the cold passes away, there will be fire from
331b1 earth. So it is evident that the coming to be of the simple bodies will be in a circle, and this will be the easiest way of change, because there are tokens present in the successive ones.

It is possible, however, for water to come to be from fire, and from air earth, and again from water and earth for air and fire to do so, but it is more difficult, because there is change of more [affections]; for it is necessary, if there is going to be fire from water, that both the cold and the wet have passed away, and again if there is going to be air from earth, that both the cold and the dry have passed away. In the same way too if there is going to be water and earth from fire and air, it is necessary for both to change.

This sort of coming to be, then, takes more time. But if one [affection] of each of the two has changed, the change, though easier, is not into each other. On the contrary, from fire and water there will be earth and air, and from air and earth there will be fire and water. For when the cold of the water and the dry of the fire have passed away there will be air (for there remains the hot of the latter and the wet of the former). But when the hot of the fire and the wet of the water have passed away there will be earth, because of the remaining of the dry of the former and the cold of the latter. In the same way too from air and earth there will be fire or water; for when the hot of the air and the dry of the earth have passed away, there will be water

(for there remains the cold of the latter and the wet of the former). But when the wet of the air and the cold of the earth have passed away there will be fire, because of the remaining of the hot of the former and the dry of the latter, and these, as we saw,[35] are just what belong to fire. And this coming to be of fire is also in agreement with perception; for flame is most of all fire, and flame is burning smoke, and smoke is composed of air and earth.

In the case of successive bodies it is not possible for the passing away of one of the elements in each of them to have brought about a change into any of the bodies, because of the remaining in both either of the same ones or the contrary ones. And from neither of these is it possible for a body to come to be—for example, if the dry of fire passed away, and the wetness of air; for in both cases the hot remains. Or if the hot passed away from both, contraries remain, namely, dry and wet. It is the same way too in the other cases. For in all the successive ones there exists, on the one hand, the same [token] and, on the other, a contrary one. So at the same time it is clear that a change from one [body] to one [body] comes about through the passing away of one [token], while a change from two to one comes about through the passing away of more than one.

That all come about from all, and in what way their change into each other comes about, has now been stated. **332^{a}1**

2.5
Ways in Which the Elements Change into Each Other

Nonetheless let us also get a further theoretical grasp on these matters in the following way. For if the matter of natural bodies is, as it seems to some people to be, water, air, and things of that sort, it is necessary for there to be one, two, or more of these. But they cannot all be one—for example, all air, or water, or fire, or earth—if indeed change is into the contraries. For if it were air, and if it remains, [the change] will be alteration, but it was [supposed to be] coming to be. At the same time, it does not seem to anyone that [it occurs] in such a way that water is at the same time also air (or whichever of the others). There will, then, be some contrariety (that is, a difference) involved, of which something will have one of the two parts—for example, fire hotness. Nonetheless, fire will not be hot air; for something of that sort is alteration, and is not what appears to happen. And at the same time, again, if there is to be air from fire, it will be due to the changing of the hot into its contrary. Therefore, this contrary will belong to the air, and the air will be something cold. So it is impossible for fire to be hot air; for then the same thing will be hot and cold. Therefore, both air and fire will be some same distinct thing, that is, some distinct sort of matter that is common to them.

35. 330^{b}3–4.

The same argument applies to all of them, because it is not possible for there to be one of them from which all derive. But neither is there some other one beyond these—for example, a sort of intermediate between air and water or between air and fire (coarser-grained than air or fire, but finer-grained than the others); for air and fire will be that thing together with a contrariety. But one of the contraries is a privation. So it is not possible for this thing ever to be alone, as certain people say[36] the unlimited is and the encompassing. Therefore, it is indifferently any of these whatever, or none of them. If, then, nothing—at any rate, nothing perceptible—is prior to these, it would be all of these. Therefore, it is necessary either for them to always remain and not change into each other or for all of them to change, or for some to do so but not others, as Plato wrote in the *Timaeus*.[37] That it is necessary for them to change into each other was proved previously;[38] and that they do not do so equally quickly one from another was stated previously, because those that have a token come to be from each other faster, and those that do not have one, slower.

If, therefore, the contrariety with respect to which they change is one, it is necessary for there to be two [elements]; for the matter is the intermediate thing, being imperceptible and inseparable. But since there are seen to be more [elements], two would be the smallest number. And if there are two [contrarieties], there cannot be three [elements], but rather four, as is evident; for this is the number of pairings; for of the six, two cannot have come about because of being contraries to each other.

These matters have been spoken about previously.[39] But, since they change into each other, that it is impossible for there to be a starting-point of them either at the extremity or the middle will be clear from the following. In the case of the extremes, it will not be possible, because all will then be fire or earth, and the account is the same as the one saying that all come from fire or earth. Nor is it possible that it is an intermediate, in the way that it seems to some[40] that, while air changes both into fire and into water, and water both into air and into earth, the extremes do not any longer change into each other; for the process must come to a stop and not go on without limit in a straight line in either direction. For then there will be an unlimited number of contrarieties in the case of one [element].

Let E stand for earth, W for water, A for air, and F for fire. If, then, A changes to F and W, there will be a contrariety belonging to AF. Let these contraries be whiteness and blackness. Again, if A changes to W, there will be another contrariety (for W and F are not the same thing). Let these contraries be dryness and wetness: D for dryness, W for wetness. But if white remains, wet and white will belong to water; if it does not, water will be black; for change is to the contrary. Therefore, it is necessary for water to be either black or white. Let it be the first. On similar grounds, therefore,

36. E.g., Anaximander.
37. 54b–d.
38. 331a12–332a2.
39. 2.2–3.
40. Reference unclear.

D (dryness) will belong to F. Therefore, there will also be a change of F (fire) into water; for contraries belong to them; for fire was first taken to be black, then dry, water wet, then white. It is evident, then, that there will be change from each other in every case, and, in the cases taken, that E (earth) will have the remaining two tokens, black and wet; for these have not yet been paired.

And that it is not possible to proceed without limit—which is precisely what we were going to prove, but we dealt with this issue before it—is clear from the following. For if in turn fire (which F stands for) changes into something else, into X for example, and does not turn back, there will be some contrariety belonging to F (fire) and X other than the ones just mentioned; for it has been assumed that X is the same as none of E, W, A, or F. Let K, then, belong to F, and Y to X. Then K will belong to all of E, W, A, and F, since they change into each other. But though in fact this has not yet been proved, at least it is clear that if in turn X changes into something else, another contrariety will belong to both X and F (fire). And similarly, it is always the case that along with each additional [element] some [new] contrariety will belong to the previous ones, so that if it goes on without limit, the contrarieties that belong to a single [element] will also be unlimited.

But if this is so, there will neither be a definition nor a coming to be of any [element]; for if one is to have come to be from another, it will have to go through so-and-so many contrarieties, and still more. So there will be some things into which there will never be change—namely, if the intermediates are unlimited in number (which is necessary if indeed the elements are unlimited in number). Further, there will not even be a change from water to fire, if the contrarieties are unlimited in number. Further, all will come to be one; for it is necessary for all the contrarieties of those [elements] above F to belong to those below, and of those below F to those above, so that all will be one.

2.6
Against Empedocles

One might well wonder at those who say that the elements of bodies are more than one—so that they do not change into each other, as Empedocles says—as to how it is open to them to say that the elements are comparable. And yet Empedocles does speak in this way: "For all these are equal."[41] But if it is with respect to quantity, it is necessary for there to be some same thing belonging to all the comparable elements by which they are measured—for example, from one *cotyle* of water, ten *cotyles* of air might come. Therefore, there was some one thing that both are, if they are measured by the same thing. But if they are not in this way comparable in quantity, as quantity coming from quantity, but in capacity (for example, if a *cotyle* of water had the

41. B17.27 DK.

same capacity to cool as ten of air), in this way they are comparable in quantity, not insofar as it is quantity, but insofar as it has a certain capacity. And it would indeed be possible for these capacities to be compared not by a measure of quantity, but by analogy—for example, as this is white, that is hot. However, in quality the "as this" signifies likeness, but in quantity[42] it signifies equality. It appears absurd, then, if bodies that are not capable of changing into each other are comparable not by analogy, but by a measure of their capacities, that is, that so-and-so much fire and many times that quantity of air be equal or similar in hotness; for the same thing in greater quantity, by being of the same kind, will have a ratio of this sort.

But then there would not be growth either, according to Empedocles, except by addition; for fire will grow by fire, "earth makes its own kind grow; *aithêr* makes *aithêr* grow."[43] These are additions. But it seems that growing things do not grow in this way.

It is much more difficult [for him] to give an account of the coming to be that is in accord with nature. For all the things that come to be by nature come to be either always or for the most part, while those that do so in a different way from always or for the most part come to be by chance or by luck. What then is the cause of a human always or for the most part coming to be from a human, or wheat—and not an olive tree—from wheat? Or, again, if something is put together *this* way, [why] is it bone? For when things come together by luck nothing comes to be, according to what he himself says, but only when they do so in a certain ratio. What, then, is the cause of this? For it certainly is not fire or earth. But then it is not love and strife either; for the former is the cause of aggregation only, the latter of disaggregation. In fact, it is the substance of each, not just "mixing and separation of what is mixed," as Empedocles says.[44] And "luck" is "the name bestowed on them"[45] and not "ratio"; for things can be mixed by luck. The cause, then, of things that are by nature is their being in a certain condition, and this is the nature of each, about which he says nothing. Therefore, he says nothing about nature. Moreover, this cause is the well-being and good, while he gives the praise to mixing alone. Yet the elements, at any rate, are disaggregated not by strife but by love, and are by nature prior to the god—although they too are gods.

Further, he speaks about movement in too simple a way; for it is not enough to say that love and strife move things, unless this was the being for love, namely, to move things in *this* way, while for strife it was to move them in *that* way. He should, then, either have defined, assumed, or demonstrated, either in an exact way, in a looser one, or in some other way. Further, since it is evident that the bodies move both by force—that is, contrary to nature—and in accord with nature (for example, while fire moves upward not by force, it moves downward by force), and what is by force is contrary to what is in accord with nature, and there is movement by force, there is also movement in accord with nature. Is this, then, the movement that love moves

42. Reading ἐν μὲν ποιῷ.
43. B37 DK.
44. B8.3 DK (= *Met.* 1015a2).
45. Empedocles DK B8.4 (= Aristotle, *Met.* 1015a2a).

things with? Or not? For on the contrary the movement moving the earth downward is like disaggregation, and it is strife that is the cause of this movement in accord with nature rather than love. So, in general too, love would seem to be rather contrary to nature. But unless either love or strife moves them, there is simply no movement of the bodies themselves, nor is there rest. But that is absurd.

Further, it is evident that bodies do move. [Let it be,] then, that strife disaggregated them; *aithêr*, however, was spatially moved upward, not by strife but, so he **334^{a}1** sometimes says, as if by luck: "it happened to run in this way then, but often in another way,"[46] while at other times he says that it is in the nature of fire to spatially move upward, while *aithêr*, he says, "sank under the earth with long roots."[47]

At the same time, he also says that the cosmos is in the same state now under strife as it was previously under love. What, then, was the primary mover and cause of movement? For it cannot then be love and strife. But of which of these movements are these the causes, if the primary mover is the starting-point?

It is also absurd if the soul is composed of the elements, or is one of them; for how will the alterations characteristic of the soul—such as being musical and then again unmusical, or memory or forgetting—take place? For it is clear that if the soul is fire, the affections it will have will be those of fire insofar as it is fire, and if it is a mixture, the corporeal ones. But none of these alterations of the soul is corporeal. But discussing these issues is work for another theoretical investigation.

2.7
How the Simple Bodies Mix to Form Compound Ones

As for the elements of which the bodies are composed: for those people who think that these elements have something in common or change into each other, if one of these views holds, the other necessarily follows. For those, on the other hand, who do not make the elements come to be from each other, nor in such a way as to come from each (except as bricks come to be from a wall), it will be absurd how fleshes and bones, or anything else of this sort, will come from them. And what was said also involves a puzzle for those who make the elements come to be from each other, as to what way something else beyond them comes to be from them. I mean, for example, that water comes to be from fire and fire from it, for they have something in common, namely, the underlying subject. But, of course, flesh and marrow also come to be from them. In what way, then, do these come to be?

And for those who speak as Empedocles does, what will the way be? Necessarily, in fact, it is composition, just the way a wall comes to be from bricks and stones. And this mixture will come from the elements that are preserved but put together next to each

46. B53 DK (= *Ph.* $196^{a}22$–23).
47. B54 DK.

other in the form of small particles. This, then, will be the way it is with flesh and each of the others. It follows, then, that it is not from any particle of flesh whatever that fire and water will come to be—in the way that from *this* bit of wax a sphere might come to be, and from some other bit a pyramid, but it would also be possible the other way around. This, then, is the way coming to be occurs when from any particle of flesh whatever both fire and water come to be. But for those who speak in the way under discussion it is not possible; on the contrary, it occurs in the way that from a wall a **334b1** stone and a brick come to be, one from one place and part, and another from another.

Similarly, a certain puzzle is also involved for those who posit a single matter [for the elements], as to how something is to come from two of them—for example, from hot and cold or fire and earth. For if flesh comes from both and is neither, nor again is it a composite in which they are preserved, what remains except for the matter to be what comes to be from both? For the passing away of one produces either the other or the matter. Or, since more and less applies to hot and cold, is it that when one of the two is fully actual, the other will be potential, but when it is not fully so, but in the way it is hot, it is [somewhat] cold, or [in the way it is] cold [it is somewhat] hot, because when mixed they destroy each other's excesses, at that time neither the matter nor either of the contraries will be fully actual, but rather something intermediate, which, insofar as it is more potentially hot than cold, or the contrary, is in accord with the relevant ratio potentially twice as hot as cold, or three times, or related in some other such way? The other things, then, will result from the contraries having been mixed, or rather from the elements, and the elements from the contraries, which in a certain way potentially are, not in the way the matter is, but in the way just mentioned. And in this way what comes to be is a mixture, while in the other way it is matter.

But since the contraries are also affected in the way determined in our first investigations[48] (for the actually hot is potentially cold and the actually cold is potentially hot, so that unless they are equal, they change into each other, and similarly in the case of the other contraries), in fact it is in this way that first the elements change [into each other]. And from these come flesh, bones, and things of this sort, the hot becoming cold, and the cold hot, when they approach the mean (for there they are neither), and the mean is of considerable extent and not indivisible. In the same way dry, wet, and things of this sort, in the region of the mean, produce flesh, bone, and the others.

2.8
Each Element Is Present in Every Compound

All the mixed bodies, the ones around the place at the center, are composed of all the simple bodies. For earth is present in all of them, because each simple body is most of all and in greatest quantity in its proper place. And water is, because the composite

48. 1.7.

must be bounded, and water alone of the simple bodies is easily bounded, and further, because earth is incapable of holding together without the wet, this being what keeps it together; for if the wet were completely removed from it, it would fall apart. It is due to these causes, then, that earth and water are present in them, but also fire and air, because they are the contraries of earth and water; for earth is contrary to air, and water to fire, to the extent that substance admits of being contrary to substance. Since, then, comings to be are from contraries, and one of the two [pairs of] extreme contraries is present, it is necessary for the other one to be present too, so that all the simple bodies are present in every composite one.

The nourishment of each thing seems to attest to this; for everything is nourished by the very same things it is composed of, and everything is nourished by several things. For even precisely the things that might seem to be nourished by only one thing, like plants by water, are in fact nourished by several; for earth is mixed with the water; that is why farmers try to mix in something when watering.

But since nourishment belongs with the matter, while what is nourished is the shape (that is, the form) taken together with the matter, it is immediately reasonable that fire alone of the simple bodies is nourished (though all of them come to be from each other), as previous thinkers also say;[49] for fire alone and most of all belongs with form because its nature is to spatially move toward the defining mark. And each thing naturally spatially moves toward its own place. And the shape and form of all things lie in their defining marks.

It has been stated, then, that all the [mixed] bodies are composed of all the simple bodies.

2.9
Material, Formal, and Final Causes of Coming to Be and Passing Away

But since there are some things that come to be and pass away, and coming to be does occur in the place around the center, we must state about all coming to be alike how many starting-points there are of it and what they are; for this way we will more easily get a theoretical grasp on the particular ones, namely, when we first get hold of the universal ones.

The starting-points are equal in number and [the same] in kind to those in the province of the eternal and the primary things; for one is so as matter, the other as form. But in addition, the third starting-point must also exist; for the two are not sufficient for coming to be, any more than in the case of the primary things.

49. E.g., Heraclitus and Hippasus.

The cause as matter for things that come to be is what is capable of being and of not being; for some things of necessity are (for example, the eternal ones), while others of necessity are not—of these, it is impossible for the first lot not to be, and impossible for the second lot to be, because it is not open to them, contrary to necessity, to be otherwise. Some things, however, are capable of being and of not being—which is precisely what the capable of coming to be and of passing away is; for it at one time is and at another is not. So it is necessary for coming to be and passing away to have to do with what is capable of being and of not being. That is also why this is the cause as matter for the things that come to be. The cause as the for-the-sake-of-which is the shape—that is, the form—and this is the account of the substance of each thing.

But one must also add a third, which all [philosophers] dream about, but none has stated. On the contrary, some thought that the nature of the Forms was sufficient cause for coming to be, as Socrates says in the *Phaedo*;[50] for he, in fact, after blaming others for having said nothing, supposes that some of the beings are Forms, others things that participate in the Forms, and that everything is said to be in accord with the Form, and to come to be in accord with partaking of it and to pass away in accord with losing it, so that if these things are true, the Forms, he thinks, are of necessity the causes of both coming to be and passing away. Others,[51] however, thought it was the matter itself; for[, in their view,] it is from this that the movement comes. But neither lot speaks correctly. For if the Forms are causes, why do they not always cause coming to be continuously rather than sometimes doing so and sometimes not, since there are always both Forms and things that participate in them? Further, in some cases we see something else being the cause; for it is the doctor who produces health in things and the scientific knower who produces scientific knowledge, despite there being health-itself, scientific knowledge-itself, and the things that participate in them. And it is the same way in the case of other things accomplished in accord with a capacity.

On the other hand, if someone were to say that it was the matter that caused coming to be due to its movement, he would speak in a way more appropriate to natural science than those who speak in the way just mentioned; for what alters and changes [something's] shape is more a cause of coming to be, and in all cases we are accustomed to say that the producer, both in the case of what is by nature and what is from craft, is whatever it is that is capable of causing movement. Nonetheless, these people too do not speak correctly; for it is characteristic of matter to be affected and to be moved, while causing movement and producing are characteristic of another capacity. This is clear both in the case of things that come to be by craft and of those that come to be by nature; for the water itself does not produce an animal from itself, nor does the wood produce a bed, but rather craft does. So these people too, because

50. E.g., 100d, 101c.
51. Reference unclear.

of this, speak incorrectly, and because they omit the more controlling cause; for they take away the essence and the shape [or form].

Further, the capacities they assign to the bodies, due to which they cause coming to be, are too instrumental, since they do away with the cause that is in accord with the form. For since, as they say, it is natural for the hot to disaggregate and for the cold to cause coming together, and for each of the others, either to affect or be affected, they say that from these, and because of these, all the others come to be and pass away. It is evident, however, that even fire itself is moved and affected. Further, what they do is much the same as if someone were to assign a saw and each of the instruments as the cause of things' coming to be; for it is necessary for the wood to be divided when someone saws it, and to be smoothed when someone planes it, and similarly in the other cases. So however much fire affects and moves something, in what way it moves it these thinkers do not go on to consider, [nor] that [it is] worse than the instruments. **336^{a}1**

We have spoken[52] in universal terms about the causes previously, and have now made determinations about matter and shape [or form].

2.10
Efficient Cause of Coming to Be and Passing Away: The Sun's Movements

Further, since it has been proved[53] that spatial movement is eternal, it is necessary, these things being so, for coming to be to occur continuously as well; for the spatial movement will produce coming to be perpetually through bringing to and bringing away what is capable of causing coming to be. At the same time, it is clear that what was said previously[54] was correct, namely, saying that spatial movement, and not coming to be, was the primary [sort of] movement; for it is much more reasonable for what is to be the cause of the coming to be for what is not than for what is not to be the cause of being for what is. But what is spatially moving is, while what is coming to be is not. That is why indeed spatial movement is prior to coming to be.

But since we have posited and proved that things are subject to continuous coming to be and passing away, and since we say that spatial movement is the cause of coming to be, it is evident that if the spatial movement is one, it will not be possible for both processes to occur, because they are contraries (for what is the same, and remains in the same state, by its nature always produces the same thing, so that either coming to be will always occur or passing away will), so the spatial movements must

52. *Ph.* 2.3, 7.
53. *Ph.* 8.7–9.
54. *Ph.* 8.7.

be more than one and must be contraries, either because of the direction [of their
30 movement] or because of its irregularity; for contraries have contraries as their causes.

That is why it is not the primary spatial movement that is the cause of coming to be and passing away, but the one in the inclined circle; for in this there is both continuity and being moved with two movements; for it is necessary, if coming to be and passing away are always to be continuous, for there to be, on the one hand, some-
336ᵇ1 thing that is always moved, so that these changes do not fail, and, on the other hand, for there to be two movements, in order that not only one of the two processes will occur. The spatial movement of the whole, then, is the cause of the continuity, while the inclination is the cause of the approach and retreat; for this results in its becoming
5 further away at one time and closer at another, and, since the distance is unequal, the movement will be irregular. So, if it causes coming to be by approaching and being close, this same thing causes passing away by retreating and becoming further away; and if it causes coming to be by repeatedly approaching, it also causes passing away by repeatedly retreating; for contraries have contraries as their causes, and passing away and coming to be in accord with nature occur in equal periods of time.

10 That is why the times—that is, the lives—of each [sort of] thing have a number that determines them; for there is an order of all things, and every time—that is, every life—is measured by a period, except that it is not the same for all, but shorter for some and longer for others; for, for some things, this period, which is their measure,
15 is one year, while for some it is longer, for others shorter. And it is evident that things we perceive are also in agreement with our arguments; for we see that when the sun is approaching there is coming to be, but when it is retreating there is withering, and each of these in equal time; for the time of withering and of coming to be in accord with nature are equal. But it often happens that things pass away in a shorter time because of
20 the co-blending with each other; for because the matter is irregular, and not everywhere the same, it is necessary for the comings to be of things to be irregular too, some faster, some slower, with the result that, because of the comings to be of these things, others come to pass away. But, as we said, coming to be and passing away will always be
25 continuous, and will never fail to occur, due to the cause we have mentioned.[55]

And it is reasonable that this happens; for we say that in all cases nature always desires what is better, and that being is better than not being (in how many ways things are said to *be* has been stated elsewhere), but this cannot belong to all things,
30 because of their being too far removed from the starting-point, although in the remaining way, the god has completed the whole, and made coming to be perpetual; for in this way being would most of all be connected together, because the closest things to being in the fullest sense are perpetual coming to be and coming to be.

The cause of this, as has often been said,[56] is circular spatial movement; for it alone
337ᵃ1 is continuous. That is also why the other things that change into each other in virtue

55. 336ᵃ32–ᵇ3.
56. E.g., 336ᵃ32–ᵇ3.

of their affections and their capacities—for example, the simple bodies—imitate the circular spatial movement; for when from water air comes to be, from air fire, and from fire water again, we say that coming to be has gone around in a circle, because it turns back again. So even the rectilinear spatial movement is continuous by imitating the circular one.

At the same time, something certain people are puzzled about—as to why it is that, when each of the bodies is spatially moving to its own proper space, the bodies have not become separated out in the unlimited time that has elapsed—is clear from these. For the cause of it is their transition into each other; for if each remained in its own place and was not changed by its neighbor, they would already have been separated out. They change, then, because of the spatial movement's being double; and because of changing it is not possible for any of them to remain in any of the places assigned in the order.

That there is coming to be and passing away, then, and due to what cause, and what the capable of coming to be is and the capable of passing away, is evident from what has been said.

But since it is necessary for there to *be* something if there is to be movement (as was said previously elsewhere); and if movement is always to be, for there always to be something; and if continuous, for it to be one, the same, immovable, incapable of coming to be, and unalterable; and if the movements in a circle are several, for there to be several, but for all of them to be somehow under a single starting-point; and because for time to be continuous, it is necessary for the movement to be continuous, if indeed it is impossible for there to be time without movement (therefore time is the number of a certain continuous movement, therefore of the one in a circle—as was determined in our starting accounts); but is the movement continuous because of the continuity of what is moved or because of the continuity of that in which it is moved (I mean, for example, the place or the affection)?—it is clear surely that it is because of what is moved (for how could an affection be continuous except because of the continuity of the thing to which it belongs—but if it is also continuous because of that in which it is moved, this holds only of the place, since it has a certain magnitude); but of it only the movement in a circle is continuous, in such a way that it is always continuous with itself; therefore that is what produces continuous movement, namely, the body spatially moving in a circle, and its movement produces time.

2.11
Necessity in the Sphere of Coming to Be and Passing Away

But since in the case of things that are in continuous movement in virtue of coming to be, or alteration, or change in general, we see that what is successive (that is, *this* coming to be after *that* in such a way as not to leave intervals), it must be investigated whether there is something, or nothing, which of necessity will be, but everything **$337^{b}1$**

admits of not having come to be. For that some do is clear, and the fact that *will be* and *is going to be* are distinct is directly due to this; for of a thing of which it is true to say that it will be, it must at some time be true to say that it is. On the other hand, of that of which it is now true to say that it is going to be, there is nothing to prevent its not having come to be; for someone who is going to take a walk may not take a walk. And, in general, since some beings admit also of not being, it is clear that the same will hold also of things coming to be—that is, their coming to be will not occur of necessity. Are, then, all of them of this sort? Or not so, but rather it is unconditionally necessary for some of them to come to be, and just as in the case of being some are incapable of not being while others are capable, is it that way too with coming to be? For example, is it necessary for solstices to have come to be—that is, is it impossible for them not to admit of not doing so?

If it is necessary for what is earlier to have come to be, if what is later is to do so (for example, if a house, a foundation, and if a foundation, clay), does it also follow, then, that if a foundation has come to be, it is necessary for a house to have come to be? Or is this no longer so, unless it is unconditionally necessary for the latter to have come to be? In this case, if a foundation has come to be, it is also necessary for a house to have come to be; for the relation that the earlier has to the later was [assumed to be] such that if the latter is to be, it is necessary for the former to be earlier. If, therefore, it is necessary for the later one to have come to be, it is also necessary for the earlier one, and if for the earlier one, it is therefore necessary for the later one—not, though, because of the earlier one, but because it was assumed that of necessity it will be. Therefore, in those cases where it is necessary for the later to be, it converts—that is, always, if the earlier has come to be, it is necessary for the later to have come to be.

If, then, it goes on without limit downward,[57] it will not be unconditionally necessary for *this* one of the later ones to have come to be, but hypothetically so; for always it will be necessary for there to be another before it, because of which it is necessary for it to have come to be. So if there is no starting-point of what is unlimited, there will be no first thing because of which it will be necessary for it to have come to be. But then even in the case of the ones that have a limit it will not be true to say that it is unconditionally necessary for it to have come to be (for example, a house when a foundation has come to be; for when a foundation has come to be, it is not always necessary for the house to have come to be), the result will be that something always is, although it admits of not always being. But if something's coming to be is of necessity, it must always be by coming to be; for "necessary" and "always" go together (for what it is necessary for there to be cannot not be), so that if it is of necessity, it is eternal, and if it is eternal, it is of necessity. And if coming to be is therefore of necessity, the coming to be of this is eternal, and if eternal, of necessity.

If, therefore, the coming to be of something is of unconditional necessity, it is necessary for it to close the circle and turn back again. For it is necessary for coming

57. I.e., toward the future.

to be to have a limit or not, and if not, for it to be rectilinear or in a circle. But of these, if indeed it is to be eternal, it cannot be rectilinear, because of there being no starting-point of any sort, whether taken going downward (going toward the future) or upward (going toward the past). But it is necessary for coming to be to have a starting-point, and—not being limited—to be eternal. That is why it is necessary for it to be in a circle.

It is necessary, therefore, for it to convert—that is, if of necessity *this*, therefore also the earlier; moreover, if the earlier, it is also necessary for the later to have come to be. And this goes on always continuously; for it makes no difference whether we say it is because of two things or of more. It is in movement and coming to be in a circle, therefore, that there is unconditional necessity. And if it is in a circle, it is necessary for each thing to come to be and to have come to be, and if this is necessary, the coming to be of these things is in a circle.

This is certainly reasonable, since it was also evident on other grounds[58] that movement in a circle—that is, that of the heaven—is eternal, because those things of necessity come to be and will be that are movements belonging to it and movements due to it; for if what is moved in a circle moves something always, it is necessary for **$338^{b}1$** the movements of these things to be in a circle as well—for example, since the highest spatial movement is produced in a circle, the sun moves in this circular way, and since it moves in this way, the seasons come to be in a circle because of it and turn back again, and since these come to be in this way, so in turn do the things due to them.

Why, then, is it that some things manifestly come to be in this way (for example, rain and air come to be in a circle, and if there is to be cloud, it must rain, and if rain, there must also be cloud), while human beings and animals do not turn back on themselves, so that the same one comes to be again? For it is not necessary, if your father has come to be, that you have come to be; but if you did, he did. And it seems that this coming to be is rectilinear. The starting-point of the investigation, for its part, is to ask again whether all [such processes] turn back on themselves or not, but rather some do so in number, others only in form. It is evident, then, that the things whose substance (the thing moved) is incapable of passing away will be the same in number (for the movement follows along with the thing moved), while those whose substance is not so, but rather is capable of passing away, necessarily turn back again in form, but not in number. That is why the water that comes from air and the air that comes from water are the same in form, not in number. But if these too are the same in number, still it is not by being things whose substance comes to be—that is, being [substance] of the sort that admits of not being.

58. *Ph.* 8.7–9.

METEOROLOGY*

BOOK 1

1.1
Scope of the Inquiry

The primary causes of nature, all natural movement, the stars arranged in the upper spatial movement, and the elements of bodies, how many they are and of what sorts, the change into each other, and coming to be and passing away in general, have been spoken about previously. It remains, then, to get a theoretical grasp on a part of this methodical inquiry, which all our predecessors have called "meteorology." It is concerned with whatever things happen in accord with nature, but a nature more disorderly, certainly, than the primary element of the bodies, and which occur in the place nearest to the spatial movement of the stars—for example, the Milky Way, comets, and moving and burning phenomena. It is also concerned with whatever affections may be regarded as common to air and water, and further the parts and forms of earth and the affections of the parts, on the basis of which we may get a theoretical grasp on the causes of winds, earthquakes, and whatever occurs in accord with their movements. Some of these we puzzle over, while others in a certain way we grasp. Further, it is **339ª1** concerned with the fall of lightning bolts, tornadoes and fire-tornadoes, and whatever other recurrent affections of these same bodies as are due to solidification.

After we have discussed these things, let us then get a theoretical grasp on whether we can give some account, in the way we have laid down, of animals and plants, both universally and separately. For when we have stated it, all of what we deliberately chose for ourselves at the start would pretty much have reached its end.

Having made a start in this way, let us speak about the following things first.

1.2
Introduction to the Material and Efficient Causes

We previously determined that there is one starting-point of bodies, from which the nature of the bodies in circular spatial movement is composed, but four other bodies

* Books 1.1–3 and 4 translated by C. D. C. Reeve. Books 1.4–14, and 2–3 translated by Malcolm Wilson. Text: F. Fobes, *Aristotelis Meteorologicorum Libri Quattuor* (Cambridge, MA, 1919).

that are due to four starting-points, the movement of which, we say, is twofold, either away from or toward the center.[1] These four are fire and air, water and earth, and fire is what always rises to the top of them, while earth is what sinks down, while the other two stand to each other in a proportional relation (for air is nearest of all to fire, water to earth).[2] Since the whole cosmos around the earth, then, is composed of these bodies, the coincidental affections belonging to which, we say, must be grasped. It is of necessity continuous with the upper spatial movements, so that all its capacity [for movement] is governed from there. (For where the starting-point of all movement is from, that must be considered the primary cause. In addition to this, it is eternal and it has no end as regards the place of its movement, but is always at its end, while these other bodies all have limited places that are separate from each other.) So, as it concerns what takes place in the cosmos, fire, earth, and what is of the same kind as these must be regarded as the kinds of in-matter cause of the things that come to be (for the underlying affected subject is what we refer to in this way), while in the sense of the cause from which, that is, the starting-point of movement, one must assign causality to the capacity of the things that are always moving.

1.3
An Inquiry into the More Appropriate Causes

Let us take up again our initial posits and the distinctions stated previously and then discuss the appearance of the Milky Way and comets, and whatever other things are of the same kind as these.

We say, then, that fire, air, water, and earth come to be from each other, and that each is potentially present in the other, just as in the case of other things in which one and the same something underlies, into which they are at last resolved.[3]

339b1 First, someone might raise a puzzle about the so-called air, as to what we must take its nature to be in the cosmos encompassing the earth, and what its position in the order is in relation to the other so-called elements of bodies. (For how great the mass of the earth is in relation to the encompassing magnitudes is certainly not unclear. For astronomical observations have already shown to us that the earth is far smaller even than some of the stars; while we never see the nature of water collectively and marked off by boundaries, nor does it admit of being separated from the body settled around the earth—for example, the evident cases of the sea and rivers, and any that there may be below [the earth] and unclear to us.) But intermediate between the earth and the outermost stars must we consider there to be a body of a single nature or several? And if several, how many, and as far as where do their places extend?

1. *Cael.* 1.2–4.
2. *GC* 330b30–331a3.
3. *GC* 331a7–8, 334b2–30, *Cael.* 3.6.

We have spoken previously about the primary element, of what sort it is in virtue of its capacity, and why all of the cosmos around the upper spatial movements is filled with that body.[4] And we do not happen to be the only ones to hold this belief. For it appears to be an ancient supposition and one held previously by human beings, since so-called *aithêr* [ether] was given this name in antiquity. Anaxagoras seems to me to think that it signifies the same thing as "fire."[5] For he thought that the upper regions are full of fire, and that the ancients[6] called the capacity there *aithêr*. And on this latter point he believed correctly. For people seem to have supposed that the body that is always running (*aei theon*) is at the same time in a way divine (*theion*) in nature, and decided to name something of this sort *aithêr*, as not being the same as any of the things around us.

For we say that the same beliefs come about in cycles among human beings, not once or twice or a few times, but an unlimited number of times.

On the other hand, those who say that not only the bodies in spatial movement but also what encompasses them are pure fire, and that what is intermediate between the earth and the stars is air, would perhaps have ceased to hold this childish belief if they had got a theoretical grasp on what mathematics has now adequately shown. For it is too simple to consider each of the spatially moving things to be small in magnitude, because it appears so to us when we look at it from here. We have also spoken about these matters previously in our speculations about the upper place.[7] But let us state the same account again now.

If the intervals were full of fire and the bodies were composed of fire, each of the other elements would long ago have vanished. But then neither are they full of air alone. For then air would far exceed the equality of its common proportion in relation to the co-ordinate bodies, even if two elements filled the place intermediate between earth and heaven. For the mass of the earth, in which the whole quantity of water is also comprised, is (one might almost say) nothing in comparison to the encompassing magnitude. However, we see the excess between their masses not to be of such a magnitude when air becomes disaggregated from water or fire from air. But it is necessary for the same ratio (*logos*) to hold between however small a quantity of water and the air coming to be from it as holds between the totality of air and the totality of water. And it makes no difference if someone will deny that these come to be from each other, yet allows that they are equal in capacity.[8] For on this way of proceeding it is necessary for the equality in capacity to belong to their quantities, just as it would have belonged if these came to be from each other. It is evident, then, that neither fire nor air alone fills the intermediate place.

4. *Cael.* 1.2–3.
5. B2 DK.
6. Reading κἀκείνους.
7. *Cael.* 289^{a}13–33, 297^{b}30–298^{a}9.
8. E.g., Empedocles B17.27 DK.

It remains, after having gone through the puzzles, to say in what way the two—I mean air and fire—are ordered in relation to the position of the primary body, and due to what cause the heat from the stars above reaches the places around the earth. Let us speak about air first, then, as we proposed, and in turn speak in this way also about these [other things].[9]

If water comes to be from air and air from water, why are no clouds composed in the upper place? For it would be more fitting for them to be composed the farther the place is from the earth and the colder it is, due to its not being that close to the heat of the stars nor to the rays reflected from the earth, which prevent clouds from being composed near the earth, by disaggregating their composition because of the heat. For cloud gatherings occur where the rays already abate because of their dispersal into the vastness.

Either, then, water does not naturally come to be from all air, or, if it comes from all of it alike, the air surrounding the earth is not air alone but rather a sort of vapor, which is why it gets composed into water again. But then if however much air there is, is all vapor, the nature of air and the nature of water would seem to be too excessive [in quantity], if indeed the intervals between the things above must be filled with some body, and if this cannot be fire because all the others would have been dried up if it were. And it remains for it to be air and all the water surrounding the earth, since vapor is disaggregated water.

About these things then let the puzzles be gone through in this way. For our part, let us speak at once with a view to the determinations that have already been stated and with a view to the ones we are now to state. For we say that what is upper and as far as the moon is a body distinct from fire or air, but varying in itself in purity and freedom from admixture, and admitting of differences, especially insofar as it stops before the air and the cosmos surrounding the earth. The circular spatial movement of the primary element and the bodies set in it disaggregate and ignite by their movement the part of the lower cosmos and body that is each time nearest to it, and so produce heat. And we must also understand it in this way even if we start as follows. For the body below the upper circular movement is like a sort of matter, and is potentially hot, cold, dry, wet, and whatever other affections follow along with these. But it becomes these and [actually] is them due to movement and immobility, the cause and starting-point of which we spoke previously.[10] At the center and around the center what is heaviest and coldest is set apart, namely, earth and water. Around these, and continuous with them, are air and what due to custom we call "fire," but it is not fire. For fire is excess of hotness and a sort of boiling. But we must understand that, of what we call "air," the part surrounding the earth is, as it were, wet and hot because it is vaporous and contains exhalations from the earth, while the part above this is already

9. 339b3.
10. *GC* 336b27–34.

hot and dry. For vapor's nature is wet and cold,[11] that of exhalation hot and dry. And vapor is potentially like water, exhalation potentially like fire. We must suppose, then, that the cause of clouds not being composed in the upper place is that air alone is not present in it but rather a sort of fire. But there is nothing to prevent its being also due to the circular spatial movement that clouds are prevented from being composed in the upper place. For the totality of air encircling the earth is necessarily flowing, except that part of it caught within the circumference that evens it out, so that the earth is entirely spherical. (For it is evident as things stand that the winds occur in marshy places of the earth, and do not seem to blow above the highest peaks.) This air flows in a circle because it is drawn along by the circular spatial movement of the whole. For the fire is continuous with the upper element and the air is continuous with the fire. So it is their movement too that prevents them from being composed into water. Instead, always, whatever part becomes heavy, the heat in it is squeezed out into the upper place and it travels downward, but other particles in turn travel upward together with the fiery exhalation, and in this way it is continually the case that while one layer is always full of air and the other of fire, each of them is always in constant flux.

About why clouds do not occur, why the air [there] is not aggregated into water, how one must conceive of the place intermediate between the stars and the earth, and what sort of body it is filled with, let this much be said.

As for the generation of heat that is provided by the sun, it is more fitting to speak about it intrinsically and exactly in the studies concerning perception[12] (for heat is a sort of affection of perception), but due to what sort of cause it comes to be, though the nature of the things there [where the sun is] is not of this sort, must be stated now.

We see, then, that movement is capable of disaggregating and igniting air, so that even things in spatial movement often manifestly melt. The sun's spatial movement alone, then, is sufficient by itself to make it happen that warmth and heat are produced. For to do so it must be fast and not too far away. The spatial movement of the [fixed] stars, though fast, is far off, while that of the moon, though close by, is slow. But that of the sun has enough of both characteristics. That more heat should be generated when the sun itself is there is reasonable, if we take the similarity from what comes about where we are. For here too it is the air that is closest to what is spatially moving by force that becomes most hot. And this happens quite reasonably. For the movement of a solid object disaggregates the air most. This, then, is one cause due to which heat reaches this place here. Another is that the fire encompassing the air is often dispersed by the [sun's] movement and by force carried downward.

An adequate sign that the upper place is not hot or fiery is also provided by the course of the [shooting] stars. For they do not come about there but below. And yet

11. Reading ψυχρόν.

12. No discussion of the felt heat of the sun, as such, is found in *DA* or *Sens.*, but there is an account of how we perceive hot and cold, and the heat of the sun is presumably a special case of this.

the more and the faster things move, the faster they ignite. In addition to this, the sun, which is the very thing that seems to be the most hot of all, is manifestly white but not fiery.

1.4
Fiery Celestial Phenomena

341ᵇ1 Now that we have laid down these distinctions, let us discuss the cause due to which the burning flames appear in the heaven, as well as shooting stars, and the "torches" and "goats" as they are called by some.[13] For all of these things are the same and exist due to the same cause, though they differ by the more and less.

The starting-point of these things and many others is the following: when the earth is heated by the sun, there necessarily occurs not one simple exhalation, as some[14] think, but two; the one more vaporous, the other more like wind; the first, a vapor from the liquid in and on the earth; the latter, smoky, since the earth itself is dry. And of these two, the wind-like one rises to the top because of its heat, and the wetter one sinks because of its weight. Because of this, the surrounding space is ordered in this way: first under the circular movement is the hot and dry, which we call "fire" (for what is common to all the smoky disaggregation has no name, but because it is the nature of this sort of thing to be ignited more than all other bodies, it is necessary to apply the names in this way); and under this nature, is the air. So, we must think of what we just now called "fire" as a fuel, which is extended throughout the remotest part of the sphere surrounding the earth, so that if it encounters a slight movement, it often ignites like smoke does. For flame is the boiling of a dry wind. So, wherever this composition is just right, it ignites, whenever it is moved in some way by the periphery.

There are differences, though, in accord with the position or amount of the fuel. If the fuel has breadth and length, a flame is often seen burning as in a field of burning stubble; but if it [burns] in length alone, they are the so-called torches and goats and [shooting] stars. And if the fuel is greater along the length than the breadth, whenever it emits sparks, as it were, as it burns (and this occurs because of side-ignitions which, albeit little, are at the starting-point) it is called a "goat," but whenever it occurs without this affection, it is called a "torch." And if the lengths of the exhalation are scattered in little bits and in many places and equally in breadth and depth, there come to be stars that seem to dart.

Sometimes the exhalation gives rise to them, when it is ignited by the movement; but sometimes the hot material is squeezed out and expelled by air when it gets **342ª1** composed due to the cold; that is why their spatial movement seems to be more like

13. Identity unknown.
14. E.g., perhaps Anaximenes B2, Xenophanes B30 DK.

an ejection and not an ignition. For one might be puzzled as to whether it is like the exhalation placed under lamps, which ignites the lower lamp from the flame above (for the speed of this effect too is wondrous, and similar to an ejection, and not like a fire that is in a constant process of change) or whether the shooting stars are ejections of the same sort of body. Indeed, they seem to come about due to both things: they occur just as they do from the lamp, and some are ejected due to being squeezed out like pips from between the fingers, so that they are seen to fall to the earth and to the sea, at night and during the day and when it is clear. They are ejected downward, because the condensation pushes them out and inclines them downward. Because of this too, lightning bolts are thrown downward.[15] For the coming to be of all these things is not ignition, but expulsion by squeezing out, since by nature, at any rate, all hot things have a tendency to travel upward.

The group of things that get composed more in the uppermost place occur when the exhalation is ignited; but the things further down do so when the exhalation is expelled, because the wetter exhalation comes together and is cooled. For this exhalation, as it comes together and condenses, inclines downward, pushes out the heat and ejects it downward. And it travels up or down or to the side due to the position of the exhalation, and however its breadth and depth happen to be oriented. Most often, it moves to the side, because there are two spatial movements involved, the one by force downward and the other by nature upward; for all such things move spatially along the diagonal. Because of this, the spatial movement of the shooting stars is most often aslant.

So, the cause, as matter, of all these things is the exhalation, but, as mover, it is sometimes the upper spatial movement, sometimes the solidification of the air as it aggregates. And all these things happen below the moon. A sign of this is that their apparent speed is similar to things we throw, which, because they are near to us, seem much to surpass in speed the stars and the sun and the moon.

1.5
The Aurora

On a clear night there sometimes appear many phenomena being composed in the heaven, such as chasms and trenches and bloody colors. The cause in these cases is the same: since the upper air is manifestly being composed in such a way as to catch fire, and the ignition occurs in such a way that sometimes a flame seems to burn, and **342b1** sometimes torches, as it were, and stars seem to travel, there is nothing extraordinary if this same air takes on a variety of colors when it is being composed. For the light that appears less intense when passing through a denser medium and the air that undergoes reflection will produce various colors and especially crimson or purple,

15. Omitting τοῦ πυρὸς . . . φύσιν.

because these especially appear, when fiery-yellow and white are mixed by being placed one in front of the other, just as stars appear crimson through the smoke, if it is very hot as they rise and set. They will also produce them by reflection, whenever the mirror is such as to receive not the form but [just] the color. The cause of these things not remaining for a long time is that their composition is swift.

When the light is breaking out from blue and black, it makes the chasms seem to have a sort of depth. And from such formations, torches too are often ejected, whenever there is more aggregation [of the air]. When it is still coming together, a chasm appears. And in general, the white produces a great variety of colors against the black, as with a flame in smoke. The sun prevents their appearance during the day, but during the night no other colors appear except crimson due to their similarity of color.

So, concerning the shooting stars, what catches fire, and again concerning other such phenomena that make swift appearances, one must suppose these to be the causes.

1.6
Comets (1)

Let us discuss the comets and the so-called Milky Way, by first going through the puzzles that arise from what has been said by others.

Anaxagoras and Democritus claim that comets are a conjunction of planets, when, because of their coming close, they seem to touch one another.

Among the Italians, some of the Pythagoreans, as they are called, say that it is one of the planets and that it makes its appearance at lengthy intervals of time and its rise above the horizon is short, which is precisely what happens with Mercury too. For because of its short rise above the horizon, it misses many appearances, so that it appears after a great interval of time.

Hippocrates of Chios, his student Aeschylus, and their associates make much the same claims as these, except they say that [the comet] does not have a comet in its
343a1 own right, but that, as it wanders, it sometimes acquires one due to its place, because our ray of sight is reflected to the sun from the liquid which is being dragged by the comet. And because the comet lags behind [the sun] most slowly in terms of time, it makes its appearance after a longer interval than the other planets (*astrôn*), since whenever it appears again in the same place, it has lagged behind the whole of its own circle. And it lags behind both toward the north and toward the south. In the place between the tropics it does not draw water to itself, because the water has been burned up by the spatial movement of the sun. And whenever it travels toward the south, it has an abundance of this sort of liquid, but because the section of the circle above the earth is small, and that below is many times the size, the human ray of sight is not able to be reflected and carried to the sun, neither when the sun is near the

tropical place nor when it is at the summer tropics. Because of this, it does not take on a comet in these places; but whenever it happens to lag behind toward the north, it acquires a comet, because the circumference above the horizon is great, while the part of the circle below the horizon is small. For the human ray of sight then reaches the sun with ease.

All these theories make impossible claims, some common, others particular.

First, then, [let us deal with] those who say that the comet is one of the planets; for all the planets lag behind in the circle of the zodiac, while many comets have been seen outside of the circle. Next, more than one have occurred together on many occasions. In addition, if they get their comet because of reflection, as Aeschylus and Hippocrates say, it would be necessary for this planet to appear at some time without a comet as well, since it lags behind in other places too, but it does not everywhere have the comet. But as it is, no other planet has been seen except the five. And these often appear well above the horizon all at the same time. And both when all these planets are visible, and when some are not visible because of being close to the sun, the fact remains that we often see comets occur. But again, it is not even true that a comet occurs only in the region toward the north, at the same time as the sun is around the summer tropics. For the great comet, which came to be at the time of the **343b1** earthquake in Achaia and the onslaught of the wave, rose from the equinoctial sunset; and many have occurred in the north. And in the archonship at Athens of Euclees, son of Molon, a cometic star came to be toward the Bear in the month of Gamelion,[16] when the sun was at the winter tropics. And yet even they claim that reflection to such a distance is something impossible.

The first objection common to these people and to those who say the comet is a conjunction is that even some of the fixed stars acquire a comet. One need not trust the Egyptians alone on this point, and yet they too affirm it: we ourselves have beheld it. For one of the stars in the groin of the Dog had a comet, though it was dim; for if you looked directly at it, its light was dim; but if you looked aside and less intensely, it was brighter. And in addition, all the comets that have been seen among us have vanished in the place above the horizon without setting, fading gradually in such a way that no body of a single or several planets lag behind. For the big star, that we mentioned previously,[17] also appeared during the winter in frosty and clear weather off the west, when Asteios was archon,[18] and on the first day it was not seen, since it had set before the sun did, but on the next day it was seen. For it lagged behind by the smallest possible extent and set straightaway. Its light extended over a third of the heaven like a cord,[19] which is why it was called a "path." It made its way up to the belt of Orion and there it dissolved.

16. January–February 426 BC.
17. 343b1.
18. 373–372 BC.
19. Reading ἅμμα.

And yet Democritus, at any rate, clung to his own opinion. For he says that some heavenly bodies (*asteras*) have been seen upon the dissolution of comets. But this ought not to happen just sometimes and not at other times, but always. And in addition, the Egyptians also claim that conjunctions of the planets with each other and with the fixed stars occur—and we ourselves have seen Jupiter[20] coming together with one of the stars in the Twins at one point and then disappearing—but no comet came to be.

Further, the matter is also evident from argument. Whether the heavenly bodies appear larger or smaller, they nonetheless appear to be intrinsically indivisible. So, just as they would produce no greater magnitude when they touch, if they were indivisible, so also, since they are not, but only appear to be indivisible, when they come into conjunction, they will not appear greater in magnitude. So, it is sufficiently clear through these arguments, at any rate, if not through others, that the stated causes about them happen to be false.

1.7
Comets (2)

Since we think that we have given a sufficiently rational demonstration about things inaccessible to perception, if we lead them back to what is possible, one might suppose from what is now apparent that these things occur pretty much in the following way.

We have laid down that the first part of the cosmos that surrounds the earth and is under the circular spatial movement is dry and hot exhalation. This exhalation, both itself and the greater part of the air that is continuous with and underneath it, is carried around the earth by the circular spatial movement. And when it is carried and moved in this way, it often catches fire, where it happens to be well mixed. That is why we claim that the sporadic shooting stars occur.

Whenever, then, as a result of the movement from above, a fiery starting-point falls into such a condensation, and it is not so great that it burns [the material] quickly and extensively, nor so feeble that it is extinguished quickly, but is larger and more extensive than that, and at the same time there happens to arise from below a well-mixed exhalation, then this star becomes cometic, and in whatever shape the exhalation happens to have been formed. If it is formed similarly in all directions, it is a comet; but if its length is greater, it is called a "bearded star." And just as the spatial movement involved seems to be the movement of a star, so also the immobility seems to be the immobility of a star. For what occurs is much the same as if one were to thrust a torch into a heap and mass of chaff or throw a small starting-point of fire upon it. The shooting stars seems to be like this; for they spread quickly along their

20. Perhaps in December 337 BC.

length because of the good condition of the fuel. So, if this [starting-point] should remain in place where the fuel is densest and does not fade away due to passing through, the end of its course would be the beginning of its spatial movement. A cometic star is just like a star's shooting, but having in itself the end and the starting-point.[21]

Whenever the starting-point of the composition is in the lower place itself, it appears as a comet by itself. But whenever it is under a heavenly body, either a fixed star or a planet, and the exhalation gets composed because of the movement [of the star], then one of these may become a comet. For the comet does not form on the stars themselves, but it forms like the haloes that appear around the sun and the moon to accompany them, even though they are changing place, whenever the air takes on the right density for this affection to occur under the path of the sun; it is in this way that a comet is like a halo for the stars, except that a halo comes to have its color by reflection, while in this case their color is the one that appears upon them.

Whenever such an aggregation occurs in association with a star, the comet must be seen to move with the same spatial movement the heavenly body has. But whenever it is composed by itself, it is seen to lag behind. For such is the spatial movement of the cosmos surrounding the earth. For the fact that a comet often arises just by itself, and indeed does so more often than around certain determinate stars, makes patently clear that the comet is not a sort of reflection, as if it were a halo associated in pure fuel with the star itself rather than, as the Hippocratics say, associated with the sun. The cause of the halo we shall discuss later.[22]

When comets are numerous, they are a sign of wind and drought, and we must suppose that this is a proof that their composition is fiery. For it is clear that comets occur because this sort of emanation is great. The result is that the air must be drier, and the liquid which is being vaporized must be disaggregated and dissolved by the mass of the hot exhalation, so that it cannot be composed easily into water. We shall speak more plainly about this affection too, when it is time to talk about winds.[23]

Whenever comets appear dense and numerous, as we said,[24] the years are conspicuously dry and windy; but when the comets are less frequent and dimmer in terms of magnitude, this sort of thing does not occur in the same way; but all the same, there is for the most part some wind that exceeds in terms of time or magnitude, since when the stone fell in Aegospotami from the air,[25] it was raised up by the wind and fell in broad daylight. At that time a cometic star happened to arise from the west. And around the time of the great cometic star the winter was dry and with winds out of the north, and the tsunami arose from an opposition of winds. For in the gulf a north wind held sway, but outside it the south blew strongly. Again, in the

21. I.e., it burns in a single place and does not shoot.
22. 3.2–3.
23. 2.4–6.
24. 344b20.
25. The famous meteorite of 467 BC.

345a1 archonship of Nicomachus,[26] a comet occurred for a few days around the equinoctial circle, not rising from the west, and under these conditions the wind around Corinth happened to arise.

As for the fact that comets are not numerous or frequent, and more outside the tropics than inside, the cause is the movement of the sun and the heavenly bodies, which not only expels the hot [material], but also disaggregates the composition [of the dry exhalation]. But the most important cause is that most [of the exhalation] gathers into the space of the Milky Way.

1.8
The Milky Way

Let us discuss at this point how and through what cause the Milky Way comes about and what it is. But first let us go through the things said by others about it. Some of the so-called Pythagoreans claim that it is a path—some claiming that it is the path of one of the fallen stars according to the storied destruction of Phaethon; others claim that the sun once traveled on this circle and that as a result this place was thoroughly burnt, as it were, or suffered some other such affection as a result of its[27] spatial movement.

But it is strange not to realize that if this were in fact the cause, the circle of the zodiac would also have to be so affected—indeed, more so than the circle of the Milky Way, since all the planets travel along it and not just the sun alone. And the whole circle of the zodiac is apparent to us; for its semicircle is always apparent during the night. But it has obviously suffered no such effect, except where some part of it touches the circle of the Milky Way.

The associates of Anaxagoras and Democritus[28] say that the Milky Way is the light of certain stars; for the sun, when it travels below the earth, does not see some of the stars. The light of those stars that are visible from the sun does not appear (for it is blocked by the rays of the sun). But, they claim, the Milky Way is the light proper to the stars, which the earth blocks off from being visible from the sun. But this too is clearly impossible; for the Milky Way is always the same and is associated with the same stars (for it is clearly a greatest circle), but the stars that are not visible from the sun are constantly changing, because it does not stay in the same place. So, the Milky Way would necessarily change place, as the sun changes place. But as things stand, it is evident that this does not occur.

345b1 In addition, if, as is now proved in astronomical speculations, the size of the sun is greater than the size of the earth, and the distance from the stars to the earth is many times greater than the distance of the sun [to the earth] (just as the distance of the

26. 341–340 BC.
27. Reading αὐτοῦ.
28. Anaxagoras A1, Democritus A91 DK.

sun to the earth is greater than that of the moon [to the earth]), the cone from the sun would cause its rays to converge not far from the earth, nor would the shadow of the earth, what we call "night," be near to the stars. Rather, the stars are necessarily all visible to the sun, and the earth cannot block off any of them.

Further, there is a third supposition about it. For some say that the Milky Way is a reflection of our ray of sight to the sun, just as with a cometic star.

But this too is impossible. For if the observer, the mirror, and what is seen in its entirety are at rest, the same part of the reflection would appear at the same point of the mirror. But if the mirror and what is seen move in the same interval [of space] relative to the observer, who is at rest, but neither with equal speed nor with the same constant distance relative to each other, it is impossible for the same reflection to be in the same part of the mirror. But the stars that travel in the circle of the Milky Way, as well as the sun, toward which the reflection occurs, move, while we stay at rest; and while they keep a similar and equal distance in relation to us, they do not maintain an equal distance in relation to each other. For sometimes the Dolphin rises in the middle of the night, but sometimes at dawn, but the parts of the Milky Way remain the same at each time. And yet this should not be the case, if the Milky Way were a reflection, and not some [real] affection in the very places [it appears].

Further, at night the Milky Way appears when we look at it in water and similar mirrors, but how can the ray of sight be reflected to the sun?

From this it is clear that it is neither the path of any of the planets, nor is it the light of the stars that are not visible [to the sun], nor is it a reflection. These are pretty much the only theories that have been handed down by others up to the present time.

But let us speak by making reference to the starting-point that has been laid down by us. For we said previously[29] that the remotest part of what we call "air" has the capacity of fire, so that when the air is disaggregated by the [upper] movement, there is separated off a sort of composition, and this we claim to be the cometic stars. So, we must suppose that what is happening here came to be in the case of the cometic stars, when this sort of segregation came to be not alone by itself, but due to one of **346^{a}1** the heavenly bodies, either the fixed or the wandering ones. For these appear under these circumstances as comets, because they follow [the stars'] spatial movement, whenever the air happens to be mixed appropriately, just as the sort of aggregation, from which we claim the halo appears by reflection, [follows] the sun. We must suppose that what happens with one of the stars occurs with the whole of the heaven and the entire upper spatial movement. For it is reasonable that, if the movement of a single star produces some such effect, the movement of all the stars should do so too, and fan {the air and disaggregate it because of the magnitude of the circle.}[30] {It is necessary that among the same greatest circles the spatial movement that is especially going to produce this. . . . For this is necessary, in order to produce a movement that

29. 340^{b}29.

30. Omitted in the better mss.

is great because of its magnitude and to make the ignition greater.}[31] And in addition, they do so in the place where there happen to be the densest, most numerous, and largest stars.

The circle of the zodiac dissolves this sort of composition because of the spatial movement of the sun and the planets. This is why, indeed, most of the comets occur outside of the tropics. Further, a comet does not appear either around the sun or around the moon; for they disaggregate [them] too quickly for a composition of this sort to form. But the circle in which the Milky Way appears when we look at it happens to be the largest and to lie in such a position that it extends far beyond the tropics.

In addition, the place is full of the biggest and brightest stars, indeed full of what we call the "sporadics" (and this is clear to see with our eyes); and so because of this, all this aggregation is continually and constantly gathered together. And this is a sign of the fact: on the circle [of the Milky Way] itself the light is greater in the semicircle which has the doubling. For in this half the stars are more numerous and denser than in the other half, indicating that the light came to be due to no other cause than the spatial movement of the stars. For if it came to be in the circle in which the greatest number of the stars lay and in the part of that very circle in which it appears to be denser in both the magnitude and the quantity of stars, it is reasonable to assume that this is the most proper cause of the affection.

The circle and the stars in it may be seen from the diagram. As for the so-called sporadics, it will not be possible to arrange them in this way on the sphere because none of them has an evident permanent position, but they are clear when you look at the heaven. For in this one alone of the circles the areas in between are full of such stars, but in the others they are manifestly intermittent. So, if we accept that the cause of the appearance of comets has been stated in a reasonable way, we must assume that it is the same with the Milky Way too. For the affection that, in this case, the comet manifests concerning one star happens to be the same concerning a certain sort of circle; and the Milky Way, to speak in the manner of a definition, is the comet of the biggest circle and is due to segregation. That is why, just as we said previously, comets are not numerous, nor do they occur often, because this sort of composition has been and is continually being separated off in each cycle into this place.

We have discussed the things that occur in the cosmos that surrounds the earth and is continuous with the [heavenly] spatial movements, and concerning the shooting stars and the burning flames and again, the comets and the so-called Milky Way. For these are pretty much the affections that make their appearance in this place.

31. Olympiodorus provides this text, which is absent in the mss.

1.9
The Effects of the Wet Exhalation: Precipitation

Let us discuss the place that has the second position after this but the first one around the earth. This is the common place of water and air and of the coincidental affections that attend upon the coming to be [of water] in the upper area. One must suppose that the starting-points and causes of all these things are similar.

The controlling and first starting-point as mover is the circle, in which the spatial movement of the sun manifestly disaggregates and aggregates by getting close or further away and is the cause of coming to be and passing away. While the earth remains at rest, the liquid surrounding it is vaporized and carried up by the rays [of the sun] and the other heat from above. And when the heat, which raises it up, departs, some of it is scattered to the upper place, while the rest of it is extinguished, because it has been elevated too high into the air above the earth. The vapor then cools and is composed again, both because of the departure of heat and because of the place, and water comes to be from air. And after its coming to be, it travels back to the earth. The exhalation from water is vapor, while the one from air to water is cloud. Mist is a residue of a cloud from its aggregation into water. That is why it is a sign of good weather rather than of rain; for the mist is, as it were, a sterile cloud.

And this circle occurs in imitation of the circle of the sun. For as the sun's circle changes direction on the slant, the water cycle goes up and down. We must suppose that it is like a river flowing in a circle up and down, common to air and water; for when the sun is close, the river of vapor flows upward, and when it recedes, the river of water flows downward. And this is naturally disposed to occur continually according to some order. So, if indeed our predecessors[32] were speaking of the Ocean [river] allegorically, perhaps they meant that this is the river that is flowing in a circle around the earth.

And since the liquid is always being raised up because of the capacity of the hot and brought back down to the earth because of the cooling, their names are appropriately applied to their affections and some of their differences. For whenever they move in little portions, they are called "droplets," but whenever they move in greater portions, "rain."

1.10
Dew and Frost

[The liquid] that vaporizes on a daily basis but is not elevated high [in the air], because the fire that draws it up is small in comparison to the water that it raises, falls back down when it is cooled at night, and is called "dew" and "frost." It is called

32. Homer *Iliad* 18.607–608, 21.195–197, *Odyssey* 11.13, 21.

"frost" when the vapor solidifies before it aggregates back into water (and this occurs during the winter and more so in wintry places); and it is called "dew" when the vapor aggregates into water, and the warmth is not so great that the liquid that is raised gets dried out, nor is the cold so great that the vapor itself is solidified, either because the place or the season is warmer. Dew occurs more in good weather and in more clement places, while frost, as has been said, in the opposite conditions. For it is clear that vapor is hotter than water (for it still contains the fire that carries it up), so that greater coldness is required to solidify it. And both occur during clear and windless weather. For [the vapor] will not be raised up, unless there is clear weather; nor could it get composed, if the wind is blowing.

And here is a sign that these occur because the vapor does not rise high: frost does not occur in the mountains. And one of the causes is that [the vapor] is raised up from low-lying and watery places, so that the heat that is lifting it, like a burden too great for itself, is unable to raise it to a place of great height, but drops it back from close by. Another cause is that the flowing air, which dissolves this sort of composition, flows especially in the heights.

Dew occurs everywhere in south winds, but not in north winds, except in Pontus. There the opposite situation holds: dew occurs in the north winds, but not in south winds. The cause is similar to what occurs during good weather, and not during wintry weather. For the south wind produces good weather, while the north wind produces wintry weather. For the north wind is cold, so that as a result of the wintry weather it extinguishes the heat of the exhalation. But in Pontus the south wind does not produce good weather in such a way that vapor occurs, while the north wind undergoes reciprocal replacement because of the cold, and gathers up the heat so that much more vapor is generated. And often it is possible to see this occur in the other places too. For wells produce more vapor in north winds than in south ones. But north winds extinguish it before any quantity is composed, while in south winds the exhalation is allowed to gather. The water itself does not solidify, just as in the place around clouds.

1.11
Correspondences between Rain/Snow and Dew/Frost

For from that place three bodies are frequently composed by cooling: rain, snow, and hail. Among these, two are analogs and occur due to the same causes as the lower ones, differing by the more and less, and by the larger and smaller quantity. For snow and frost are the same, and so are rain and dew, but the first members of the pairs are of large quantity and the second members of small quantity. For the rain occurs when a large quantity of vapor cools, and the cause of this is that both the place and the time, in which and from which [the vapor] is collected, are large. But dew is of a small quantity; for the composition of it occurs daily and the place [from which the

liquid is gathered] is small, as the rapidity of its coming to be and the smallness of its quantity make clear. Likewise, also with frost and snow: for when the cloud solidifies, it is snow, and when vapor solidifies, it is frost. That is why they are the sign of a cold season or region; for when there is still a lot of internal heat, it could not be solidified, unless the cold were in control. For in the cloud there is a lot of heat still present left over from the fire that vaporized the liquid from the earth.

Hail occurs in that [upper] place, but the [analog] is missing in what vaporizes close to the earth. For just as we said, as snow is [up] there, so frost is here; and as rain is [up] there, so dew is here. But as hail is there, here there is no similar corresponding thing. And the cause will be clear when we have spoken about hail.

1.12
Hail

As regards the circumstances of its coming to be, it is necessary to grasp at the same time both those that do not lead to errors and those that seem to be paradoxical.

Hail is ice, and water solidifies in the winter. But hail occurs especially during the spring and fall, and secondarily during the late summer too, but during the winter rarely and whenever there is less cold. And, in general, hail occurs in more clement **348ᵃ1** places, while snow in colder ones.

It is also strange that water should solidify in the upper place. For [vapor] cannot solidify before it becomes water, nor can water remain aloft for any period of time. Nor again does rain rest upon the air, like the droplets do that are carried up because of their small size and spend time in the air—just like earth and gold, too, often float upon water due to the smallness of their parts—and then many small parts come together, and large droplets fall. This cannot occur in the case of hail; for solidified objects do not grow together like wet things do. So, it is clear that a lot of water remained high; for otherwise so great a quantity could not have solidified.

Some people[33] think that the cause of this affection and coming to be is this: when the cloud is pushed up into the upper place, which is rather cold because the reflections from the rays of the sun from the earth peter out there, when the water arrives there, it solidifies. That is why[, they think,] hail occurs more during the summer and in warm regions, because the heat pushes the clouds up from the earth to a greater extent. But it happens that hail occurs least of all in extremely high places. And yet it should, just as we also see snow coming to be especially in high places. And again, often clouds are seen traveling with a great deal of noise so close to the earth itself that they frighten those who hear and see them, since they suppose that something of larger scale is on its way. And sometimes, even when such clouds are seen without the noise, a great hail occurs, unbelievable in its magnitude and not round in shape,

33. E.g., Anaxagoras. See 348ᵇ12.

because the solidification has occurred close to the earth and therefore their spatial movement was brief, and not as those people claim it is.

Surely, big hail must occur by that which is most a cause of solidification; for hail is ice, and this is clear to anyone. And the hailstones that are not round in shape are big. This is a sign that they have solidified close to the earth. For those that have moved from afar become broken off all around, because they have moved a long distance, and become round in shape and smaller in size.

It is clear that the solidification occurs not by being pushed up into the cold upper place. But, since we see that reciprocal replacement occurs between hot and cold (for this reason the things under the earth are cold in warm seasons and warm in cold seasons), we must think that this occurs in the upper place too, so that in the warmer seasons the cold undergoes reciprocal replacement inside because of the heat around it, and sometimes quickly produces water from the cloud. That is also why the droplets become much bigger on warm days than in the winter, and the rain is more violent. For it is said to be more violent when it is more concentrated, and it is more concentrated because of the speed of the condensation. (This is the very opposite to what Anaxagoras claims; for he says that this affection happens [to the cloud] when it goes up into cold air, but we say that it happens when it descends into the hot, and most of all, when it makes the greatest descent.)

But when the cold inside undergoes even further reciprocal replacement by the hot outside, it produces water, solidifies, and becomes hail. And this happens when the solidification is faster than the spatial movement of the rain downward. For if it spatially moves in a certain given time, while the coldness, being intense, brings about the solidification in a shorter time, nothing prevents the solidification from happening while still aloft, if the solidification occurs in a shorter time than the downward spatial movement. And the nearer and the more concentrated the solidification is, the more violent is the rain, and the bigger are the droplets and the hail, since they are moved through a short space. And the big droplets do not fall densely due to the same cause. Hail occurs less during the summer than during the spring and fall; more so, however, than during the winter, because the air during the summer is dryer. In the spring the air is still wet, and in the fall it is already becoming wet. Hail sometimes occurs, as has been said,[34] during the late summer due to the same cause.

Preheating the water contributes further to the speed of its solidification; for it cools faster. This is why many people, when they want to cool water quickly, first place it in the sun; and people in Pontus, when they make tents on the ice for fishing (for they fish by cutting through the ice), pour hot water on their stakes, because it solidifies faster. For they use ice like lead, so that the stakes are stable.

And rain that is being composed quickly becomes hot in regions and seasons that are warm. Around Arabia and Ethiopia, rains—and violent ones—occur during the summer and not during the winter, and many times during the same day due to the

34. 348ª1.

same reason. For [the vapor] cools quickly because of reciprocal replacement, which occurs because the region is intensely warm.

About rain, dew, snowfall, frost, and hail, then, due to what cause they occur, and what their nature is, let this much be said.

1.13
Rivers

Let us speak about the winds and all the wind-breaths, and further about the rivers and the sea, by first going through the puzzles about them on our own. For, just as on other subjects, we have heard nobody say anything about these matters that any random person could not say.

There are some[35] who claim that the wind is air (as it is called), when it is in movement and flowing, but that when it is composed, this same air again is cloud and rain, on the grounds that rain and wind are of the same nature, and that a wind is a movement of air. That is why some of those who wish to speak cleverly claim that all winds are a single wind, because it so happens that all moving air is one and the same thing, and [they think that], without being different at all, they seem to be different because of the places from which each of them happens to flow—making much the same claim as if one thought that all rivers are a single river. That is why ordinary people speak better without investigation than those who speak on the basis of an investigation of this sort. For if the rivers flowed from a single starting-point, and the winds for their part did likewise, then perhaps those who speak in this way would make some sense. But if the situation in the two cases is similar, their ingenious theory would clearly be a falsehood, since the proper thing to investigate is this: what a wind is, how it occurs, and what moves it; where do they draw their starting-point from and whether we really must suppose that wind flows, as it were, from a vessel, and whether it flows until the vessel is emptied, as if it were being released from wineskins, or as the painters paint them, discharging their starting-point from themselves. **349b1**

And some people think that the coming to be of rivers is the same; for the water that is drawn up by the sun, falls as rain again, gathers under the earth, and flows from a great hollow, either all the rivers from one hollow, or each from its own. And they claim that water does not come to be, but is collected from the winter storms into such reservoirs, and this is the coming to be of the multitude of rivers. That is also why their flow is always greater in the winter than in the summer, and why some rivers are perennial and others not. Rivers, whose collected waters, because of the size of their hollow, are big enough to hold out and not to be used up before the rains return in the winter, are persistent and perennial; but those whose reservoirs are

35. Hippocrates of Cos 64C2, Anaximander A24 DK.

smaller, because of the paucity of the water get dried out before the water from the heaven arrives, since their vessel gets empty.

And yet the fact is obvious, if one is willing to visualize a sort of receptacle and conceive what size [is necessary] for the continuous, daily flow of water. For the receptacle of all the water flowing for a year would exceed in magnitude the earth's bulk or would not fall much short of it.

But it is clear that many such receptacles occur in many places in the earth. Nonetheless, it is strange if one does not think that water comes to be from air by the same cause both above the earth and in the earth. So if the vaporizing air is composed into water because of the cold above the earth, we must think that this same process occurs as a result of the cold in the earth, and that it is not only the separating off of the water and its consequent flow that occurs in the earth, but also that it occurs continuously.

Further, we must think that the starting-point of the rivers' water, that which does not come to be but is already available day by day, is not like certain lakes that are separated off under the earth, as some say, but rather we must think that just as in the places above the earth small drops are composed and they in turn are composed with others and in the end the rainwater comes down in great quantity, so also in the earth at first they flow together from small [drops] and are like when the earth causes the starting-points of the rivers to gush forth together into one. And the facts themselves make this clear. For those who make irrigation systems conduct [the water] by
350^{a}1 conduits and channels, as if the earth were sweating from its heights. That is why the courses of rivers manifestly flow from the mountains too, and the most numerous and biggest of the rivers flow from the biggest mountains. Likewise too, the most numerous fountains border on mountains and high places. But in plains without rivers altogether few [fountains] occur. For the mountainous and high places, hanging over [lower areas] like a dense sponge, let the water percolate little by little and flow together in many places. For they both receive a great mass of falling water (for what is the difference whether the curve forms a hollow facing up or a convex facing down, since either way they will contain an equal mass of body?) and cool and aggregate the rising vapor back into water. That is why, as we said, the greatest of the rivers are seen to flow from the greatest mountains.

And this is clear if you look at the maps of the earth. For people draw up these [maps] in this way by learning from each [of their sources] things that those who report them happen not to have been eyewitnesses of. In Asia the most numerous and biggest rivers are seen to flow from the so-called Parnassus mountain. And this is agreed to be the biggest of all mountains toward the winter sunrise. For once one climbs over this mountain, the outer sea is visible, but its limit is not clear from inside. From this mountain there flow, besides other rivers, most notably the Bactrus, the Choaspes, and the Araxes rivers; the Tanais, being a part of this last one, is split off into lake Maeotis. And the Indus flows from it too, having the greatest flow of all rivers.

From the Caucasus many other rivers flow surpassing in number and magnitude, especially the Phasis. The Caucasus, for its part, is the largest of the mountains toward the summer sunrise, both in extent and in height. Indications of its height are that it is visible from what are called the "depths"[36] and to those sailing into the lake; again, the sun shines on its peaks during the night up till the third part both from the dawn and again from the nightfall. And [an indication] of its size is that it has[37] many places, where many tribes dwell and they claim that there are large lakes, but they claim that all these places are nonetheless visible as far as the highest peak.

And from Pyrene (this is the mountain toward the equinoctial sunset in Celtic territory) flow the Ister and the Tartessus rivers. The latter is outside the Pillars [of Heracles], but the Ister flows through the whole of Europe to the Black Sea. Among the other rivers, the greatest number flow northward from the Hercynian mountains. These mountains both in height and extent are the largest in that place. Under the Bear itself beyond remotest Scythia are the so-called Rhipae, concerning whose magnitude very fanciful accounts are reported: in any case, from here flow the most numerous and largest rivers after the Ister, as they claim. **$350^{b}1$**

Similarly, around Libya, some rivers flow from the Ethiopian mountains, like the Aegon and the Nyses, but the biggest of those that have names, that is, the so-called Chremetes, which flows into the outer sea, and the primary stream of the Nile, flow from the so-called Silver mountain.

Among those around the regions of Greece, the Achelous flows from Pindus, the Inachus from there, and the Strymon, Nessus and Hebrus, all three being from Scombrus; and there are many streams from Rhodope as well.

One might find that the other rivers flow likewise, but we mentioned these for the sake of evidence, since where rivers flow from marshes, the marshes happen to lie usually below mountains or places that gradually rise to a height.

We clearly must not think that the starting-points of rivers occur as if from delimited hollows. For neither the extent of the earth nor likewise that of the clouds would be practically sufficient, if the only thing that could flow is what [already] exists, and if it were not the case that some water departed and some came to be, but rather was always being dispensed from what exists. That [rivers] have springs under the mountains bears witness to the fact that a great deal of liquid flows together little by little and into a small space, which the place passes on, and in this manner the springs of rivers occur.

Nonetheless, it is in no way strange that there are such places that have, like lakes, an abundance of water, except that they are not big enough for this to occur,[38] any more than if one should suppose that the immediately visible springs of rivers are. For

36. $351^{a}11$.
37. Reading ἔχει.
38. I.e., to supply rivers.

pretty much the greatest number of rivers flow from fountains. So, it is like supposing that the former lakes and these visible springs are the entire body of water.

And the rivers that go underground make clear that there are such fissures and gaps in the earth. This occurs in many places in the earth; for example, in the Peloponnese most of them are found around Arcadia. And the cause of this is that, being mountainous, it does not have outlets from the hollows to the sea. For the places get filled up [with water] and do not have outlets, and so find passages to the depths, as the water descends from above and forces its way. In Greece, such things occur on a very small scale, but there is a lake below the Caucasus, which the inhabitants of the place call the "sea." For this, though many big rivers contribute to it, has no clear outflow, but issues forth below the earth where the Coraxi live, around the so-called depths of the Black Sea. These are a limitless depth of the sea. At any rate, no one has yet been able to drop a [sounding stone] and discover the bottom. In this place, distant from the land about three hundred stades, potable water comes up over a wide area, not continuously, but in three streams. And around Liguria a river[39] no smaller than the Rhone is swallowed up, and again issues forth in another place. As to the Rhone, it is a navigable river.

1.14
Land-Sea Exchange

It is not always the same places of the earth that are wet or dry; instead, they change according to the comings to be and failures of the rivers. That is why the areas surrounding the firm ground and the sea undergo change, and it is not the case that the same areas remain always and for all time land or sea; instead, the sea occurs where there was dry land, and where now there is sea, land will occur there again. However, we must think that these things come about according to some order and cycle. The starting-point and cause of these things is that the insides of the earth, just like the bodies of plants and animals, have a prime and an old age, except that [the plants and animals] do not turn out to be affected part by part, but the whole at the same time necessarily comes to its prime and wastes away. But with the earth this occurs part by part because of cooling and heating.

These things increase and decrease because of the sun and its revolution, and due to these things too, the parts of the earth take on different capacities, so that it is able to remain wet up to a certain time, then it dries out and grows old again. But other places revive and become wet part by part. And springs necessarily disappear as the places become drier, and when this happens, the rivers that were big first become small, and then in the end they dry up; and when the rivers relocate, disappearing from one place and correspondingly coming to be in others, the sea changes. For

39. Perhaps the Po.

where the sea has been pushed out by the rivers and has encroached [elsewhere], it necessarily produces dry land as it departs; and where it was full and silted up with its currents and dried out, there it must form a lake again.

But because all natural coming to be in the earth occurs gradually and over lengths of time very great in comparison to our lifespan, we do not notice them as they occur; and the extinction and destruction of whole nations occur before the change of terrestrial phenomena is remembered from beginning to end. The biggest and most rapid destructions occur in wars, but others occur through diseases and others again through famine; and when through the latter, some are big, while others are so gradual that even the migrations of such nations go unnoticed, because some people leave the lands, while others abide until the region is no longer able to feed any number of them. So, from the first departure to the last, it is likely that too long a period of time passes for anyone to remember, and [even] if a remnant [of the nation] still survives, they forget because of the length of time. And in the same way one must think that even the time fails to be noticed at which each nation first undertook a settlement in places that change and become dry from being marshy and wet. For the progress occurs here little by little over too great a time to remember who were first and when, and what state the place was in when they came.

This has happened with Egypt too. For this place clearly has become ever drier, and the whole region is clearly a deposit from the river Nile and, because little by little the marshes dried out and the nearby peoples came to settle, the length of time deprived them [of the awareness] of the starting-point. So all the mouths of the Nile, with the single exception of the one at Canopus, are artificial and not the product of the river. (And in ancient times Egypt was called "Thebes." Homer makes this clear,[40] though he is, so to speak, young in comparison to these changes. He makes mention of that place, as if Memphis did not yet exist at all or, at any rate, was not of its present size.) And it is likely that this would happen in this way; for the lower places were settled later than the upper ones. For the places nearer to the process of silting are necessarily marshy for a longer time, since lakes were always forming more in the furthest areas. And this area undergoes change and flourishes again; for the places dry out and come into a good condition, while those that were formerly temperate become worse as they dry out excessively.

This is what happened in Greece in the region of the Argives and Myceneans. For at the time of the Trojan War, Argos, due to its being marshy, was able to feed few people, while Mycenae was in a good condition (for which reason it was held in higher esteem), but now it is the opposite for the cause that was mentioned. For Mycenae has become infertile and altogether dry; but the land [of Argos] that was infertile because of the formation of lakes is now useful. So, we must suppose that the same thing happens in great places and whole regions, as has happened in this place, which is small.

40. *Iliad* 9.381.

Those who examine small things think that the cause of such affections is the change in the whole, because they suppose that the heaven is in the process of coming to be. That is why they claim that the sea too is coming to be smaller, on the grounds that it is getting drier, because more places are clearly undergoing this process now than previously. This is partly true and partly not true. For although a good number of places formerly wet are now dry land, the opposite is also certainly true. For if they look, they will find the sea making incursions [on the land] in many places. But one must not suppose that the cause of this is the coming to be of the cosmos. For it is ridiculous to suppose that the universe changes because of small and momentary changes, and without a doubt the bulk and magnitude of the earth is nothing in comparison to the whole heaven. On the contrary, we must think the cause of all these things to be a great winter and excessive rain in some great cycle that occurs at its appointed times, like the winter in the course of the annual seasons.

And this does not always occur in the same places, but like the so-called flood in the time of Deucalion. For this came to be mainly in Greek territory, and within Greece especially in old Hellas. This is the district around Dodona and the Achelous river. For this river has changed its course in many places. For the Selli used to live there and those who were once called "Graeci," but now are called "Hellenes." So whenever such excessive rains occur, one must think that the water lasts for a long time. And just as now the cause of some rivers being perennial and others not is, according to what some people claim, the size of the chasms under the earth and, according to what we claim, the size, density, and coldness of the lofty places (for these receive, contain, and produce the greatest amount of water; but where the range of overhanging mountains is small or porous and rocky and clayey, these places fail first), likewise it is necessary to think that the time, when such a transfer of liquid occurs, is such as to make the liquid in places more perennial. And in time these [latter] areas become more dried out,[41] while the others, the wet ones, become less dried, until the beginning of the same cycle returns. But since the whole must undergo some change—not however coming to be or passing away, since the universe endures—the same places, as we say, must not always be wetted by sea and river and again be dry.

The facts make this clear: we claim that the Egyptians are the oldest people and all their land manifestly came to be and is a product of a river. And this is clear to anyone who looks at the region itself. The facts concerning the Red Sea are also a sufficient proof. For one of the kings attempted to cut a channel through [to it] (for it would have been no small benefit for them to make the entire place navigable; and Sesotris is said to be the first one among the ancients to have tried), but he found the sea to be higher than the land. That is why he, on the earlier occasion, and Darius later, stopped digging, lest the course of the river be destroyed with the admixture of the sea. So it is clear that everything was once a single sea continuous with it. That is why the parts of Libya around Ammon also appear to be lower and hollower than we

41. Secluding γιγνόμενα.

would reasonably expect for low lands. For it is clear that when the silting came in, lakes and dry land came to be, but as time went on, the water, which was left behind in it and formed lakes, dried up and has now vanished. Further, the circumstances surrounding lake Maeotis have so advanced, because of the silting of the rivers, that only boats much smaller in size now sail into it for business than used to sixty years ago. From this it is easy to calculate that this lake, like the majority of lakes, is at first the work of the rivers, but in the end they all must become dry.

Further, the Bosporus always flows because of the new deposits being formed, and it is possible actually to see with our own eyes how it happens. For whenever the stream formed a bank on the Asian side, what was behind the bank came to be a lake, small at first, and then it would have dried up, and after this another bank came to be next to this, and a lake next to this. And this process continued without stop in this manner. And as this occurred many times, as time went on, something like a river must occur and in the end this too must become dry.

It is clear anyway, since time will not run out and the whole universe is eternal, that neither the Tanais nor the Nile has always flowed, but the place, from which they flow, was once dry. For their work has a limit, but time does not. Likewise, it is appropriate to make this claim in connection with the other rivers as well. But then, if indeed rivers come to be and pass away, and the same places on the earth are not always wet, the sea too must change accordingly. And as the sea retreats and advances continually, it is clear that it is not always the same parts of the whole earth that are sea and firm ground, but that everything changes with time.

We have now discussed why it is not always the same parts of the earth that are dry or navigable, and due to what cause these things happen; likewise, also why some rivers are perennial while others are not.

BOOK 2

2.1
Whether the Sea Has Springs

Let us speak about the sea, what its nature is and for what cause such a large quantity of water is saline, and again how it came to be in the first place.

The ancients[42] who busied themselves with stories about gods make it have springs, so that they might have starting-points and roots for earth and sea. For in this way they perhaps supposed that what they were describing was more high-flown and more dignified, as befits an important part of the universe; and they supposed that

42. Homer, *Iliad* 21.196, makes Ocean the source of rivers and springs. Hesiod, *Theogony* 282, 737–738 and 807–809 (the springs of Ocean and sea), 728 (the roots of the sea), 785–792 (the river Styx flowing underground into Ocean).

the whole of the rest of the heaven was composed around this place and for its sake, since they thought it was the most estimable thing and a starting-point.

Those wiser in human wisdom make it have a coming to be. For they claim[43] that at first the whole region around the earth was wet; then, as it was being dried out by the sun, part [of the water] vaporized and made the winds and the turnings of the sun and the moon, while part remained behind as the sea. That is why they think it is becoming even smaller, as it is drying up, and at some point will be completely dry in the end. But some of them claim that when the earth is heated by the sun, something like sweat occurs.[44] That is also why it is saline; for sweat is saline too. Others claim that the earth is the cause of the salinity: just as [water] becomes saline when strained through ashes, in the same way the sea is saline, because this sort of earth is mixed with it.[45]

At this point it is necessary to get a theoretical grasp on the basis of the facts that it is impossible for there to be springs of the sea. Among the terrestrial waters, some happen to flow, while others are stagnant. The flowing waters are invariably from springs (concerning springs, we said previously[46] that we need to think that a spring is not a starting-point the way in which something is dispensed from a vessel, but as a starting-point in the sense of the first point at which the water, continually coming to be and flowing together, meets in a single body). Among stagnant waters, on the other hand, some are collected in depressions, like the water of swamps and lakes, some big and some small in quantity, while others are spring water. These latter are all artificial, by which I mean what we call "well water." In all these cases the spring must be above the flow. That is why the former flow spontaneously, the fountains and the rivers, while these latter require additional labor and craftsmanship.

These, then, are the number and sorts of different waters. And since they have been distinguished in this way, it is impossible for the sea to have springs; for it can be of neither of these kinds; for it neither flows nor is it artificial, yet all water that comes from springs has one of these two features. Nor do we see any so large a quantity of stagnant water produced spontaneously from a spring.

Further, the seas that do not mix with one another in any place at all are
354ᵃ1 numerous—the Red Sea clearly has some small traffic with the sea outside the Pillars [of Heracles], but the Hyrcanian and Caspian Seas are separate from this sea and are inhabited all way around, so that the springs could not go unnoticed if they existed some place.

Also, the sea manifestly flows inside straits because the water ebbs and flows many times wherever the surrounding earth contracts the large sea into a small area. This is

43. Anaximander A27, Diogenes of Apollonia A17, Xenophanes A33.5–6, Anaxagoras A90, Democritus A100 = *Mete*. 356ᵇ10, Antiphon B32 DK.
44. Empedocles A66 (357ᵃ24), Antiphon B32 DK.
45. Anaxagoras A90, Metrodorus A19 DK. See also Xenophanes A33(4), Democritus A99a DK.
46. 350ᵇ22–30.

not apparent in the broad extent of the sea, but where, because of the narrowness of the earth, the sea extends over a small place, it is necessary that the small oscillation in the open sea appear to be large there.

All the sea inside the Pillars of Heracles flows according to the concavity of the land and the size of the rivers. For the Maeotis flows into the Black Sea, and this flows into the Aegean. But this occurs less clearly in the case of the next open seas beyond these. But with the former it does happen because of the size of the [tributary] rivers (for more rivers flow into the Black Sea and lake Maeotis than into any other area many times their size) and because of their own shallowness. For the sea clearly gets continually deeper, the Black Sea being deeper than lake Maeotis, the Aegean than this, and the Sicilian sea than the Aegean. The Sardinian and Tyrrhenian seas are the deepest of all. The area outside the Pillars [of Heracles] is shallow due to the mud, and is windless since the sea is in a hollow. So just as the rivers clearly flow severally from the heights, so also with the whole earth, the greatest flows occur from the higher places in the north. The result is that some seas are not deep, due to their being poured out, while other seas beyond are deeper. There is a sign that the parts of the earth toward the north are higher in that many of the ancient meteorologists[47] were persuaded that the sun does not travel below the earth, but around the earth and this [northern] area, and that it disappears and creates night, because the earth is high toward the north.

Let this, then, be the sort and extent of our discussion of why there cannot be springs of the sea and of the cause due to which it is seen to flow in this way.

2.2
Views on the Origin of the Sea

We must now discuss the sea's coming to be, if it has come to be, and its taste, what the cause of its salinity and bitterness is. **354b1**

The cause that made our predecessors think that the sea is the starting-point and body of all waters is the following: it would seem to be reasonable, just as there is a concentrated mass and starting-point of the other elements because of their large amount, and parts of their mass undergo change and are mixed with the others—like the mass of fire in the upper places and the mass of air in the next place after fire, and the body of earth around which all these things clearly lie—so clearly, according to the same line of argument, it is also necessary to inquire about water. For there is no other evident body of this sort lying concentrated [in one place], as is the case with the other elements, except for the sea in its magnitude. For the water of the rivers is neither concentrated nor stagnant, but it appears on a daily basis as something

47. Anaximenes A7.6 DK.

that is continually coming to be. So it is from this puzzle that the sea seemed to be a starting-point of both wet things and of all water.

That is also why some claim[48] that the rivers flow not only into the sea, but out of it as well; for, when it is strained, the saline water becomes potable. But another puzzle is opposed to this belief: Why exactly is this composed water saline and not potable, if indeed it is the starting-point of all water? The cause will be at the same time the solution of this puzzle, and we must lay it down correctly as our primary supposition about the sea.

Since the water extends around the earth, just as the sphere of the air is around this, and that of the so-called fire around it (for this is the remotest of all, whether as the majority of people say it or as we do[49]), and since the sun travels as it does, and in consequence there is change and coming to be and passing away, the most delicate and sweetest part of the sea is drawn up on a daily basis, is disaggregated and carried as a vapor to the upper place, and there again being composed because of the cold, it is carried back down to the earth. And nature tends to do this continuously, as was said previously.[50]

This is why all our predecessors who supposed that the sun is nourished by liquid are ridiculous. Some, at any rate, make the claim that this is why it makes its turnings: **355[a]1** the same places are not always able to provide it with nourishment. Yet [the sun] either has to get [the nourishment] or be destroyed. For the fire that we can observe also lives only as long as it gets food, and liquid alone is food for fire. On the likely supposition that the liquid was drawn up and reached the sun, or that its rising was of the same sort as that of a flame coming to be, they made their conjecture about the sun in this way as well. But the cases are not similar. For flame occurs through the continuous change of wet and dry, and it is not nourished (for it does not remain as the same thing for—one might almost say—any time). But it is impossible that this should happen with the sun, since if it *is* nourished in the way they claim, it is clear that the sun is not just new every day, as Heraclitus claims,[51] but is always and continuously new.

Further, the drawing up of liquid by the sun is similar to water heated by fire. So, if the fire, which burns from underneath, is not nourished [by the water], neither is it a likely supposition that the sun is, not even if it heats up and vaporizes all of the water. And it is strange for them only to be worried about the sun and to overlook the preservation of the other heavenly bodies, being so great in number and magnitude. These people face the same absurdity as those who claim that at first the earth also was wet and that, since the cosmos surrounding the earth was heated by the sun, the air came to be and the whole heaven grew, and this [air] provided the winds and produced [the sun's] turnings. For we clearly see that the water drawn up always

48. Hippo B1, Xenophanes B30 DK.
49. 340[b]22, 341[b]14–18.
50. 347[a]5–6.
51. B6 DK, Xenophon A33.3 DK.

comes back down. Even if it does not return on a yearly basis and the same [amount] in each district, still it returns all that it has taken in some regular periods of time. Thus, the things above are not being nourished [by water], and it is not the case that some water remains air there after its coming to be [air], while the rest of water, after coming to be [air] passes away [and changes] back into water, but rather all likewise dissolves and is composed back into water.

All the potable and sweet water is carried up due to its lightness, and the saline remains behind because of its weight, but in a place not properly its own. For this is something one must think it also appropriate to be puzzled about (for it is unreasonable if there is no [proper] place for water as for the other elements), and its solution is as follows: the **$355^{b}1$** place we see the sea occupying is not the place of the sea, but rather the place of water. But it appears to be the place of the sea, because the saline water stays there because of its weight, while the sweet and potable is carried up because of its lightness, just as happens in the bodies of animals. For in these cases, though the food goes in sweet, the sediment of the wet food and its residue is clearly bitter and saline. For the sweet and potable material is drawn off by the innate heat and makes its way into the flesh and the other systems of parts, as each is naturally disposed.

Just as it is strange (indeed, the supposition would be incorrect) if someone does not consider the stomach as the place of the potable nourishment, because it disappears quickly, and instead considers it the place of the residue, because he sees this remaining behind, so the case is similar in these matters as well. For this is, as we say, the place of water, and that is why all the rivers and all the water that is coming to be flow into it. For they flow into the deepest hollow, and the sea occupies such a place on the earth. But one part is all carried up quickly because of the sun, while the other part is left behind for the stated[52] cause.

As for investigating the ancient puzzle as to why such a great mass of water appears nowhere (for the sea never gets any bigger though rivers countless and boundless in size flow into it every day), it is not at all strange that some people are puzzled. But when one examines it, the solution is not difficult to see. For the same amount of water poured out on a surface does not dry out in the same time as water in a concentrated mass; rather, [the drying times] differ so much that the latter could last the whole day, while the former could all disappear in the moment of a thought, just as if someone should spread a ladle full of water out on a big table. This is just what happens with the rivers: since the waters are always flowing continuously in a concentrated manner, the water that arrives at the vast and flat place [of the sea] dries out quickly and without a trace.

What is written in the *Phaedo*[53] concerning the rivers and the sea is impossible. For it is said that all are connected with each other through channels pierced under the earth and that the starting-point and spring of all waters is the so-called Tartarus,

52. $355^{a}32$–$^{b}6$.
53. 111c–113c.

356a1 a large quantity of water around the middle; and from this issue forth all the flowing and the non-flowing waters. And this first water, a starting-point, produced a flow in each of the streams by its endless oscillation; for it does not have a stable seat, but is always whirling around the middle. And as it moves up and down it produces the flow of the rivers. Some of it forms lakes in many places, for example, our [Mediterranean] sea, but they all lead back around in a circle to the starting-point, whence they began to flow, many through the same region, but others flow back opposite to the place of their efflux, for example, if they started to flow from below, they come back in from above. The descent of the water is as far as the center; for all the rest of the spatial movement is then uphill. And the water gets flavors and colors through whatever sort of earth the rivers happen to flow.

On this account, it turns out, the rivers do not always flow in the same direction; for since they flow toward the middle whence they flowed forth, they will flow no more down than up, but rather to whichever side Tartarus inclines in its swell. And yet, if this occurs, the proverbial "rivers flowing uphill" would occur—which is precisely what is impossible.

Again, where will the water that is produced and carried up again come from? For it is necessary to destroy its whole mass, if the equilibrium is to be always preserved. For however much flows out, flows back toward the starting-point.

And yet all the rivers that do not end in each other clearly do end in the sea. No river ends in the earth, but if it disappears, it resurfaces again; and those rivers that flow far through the hollows [of the earth] become large; for they receive the flows of many rivers by absorbing their courses by their positions and length; and this is just the reason why the Ister and the Nile are the biggest of the rivers debouching into this sea. And where springs are concerned, different people claim different causes for each of the rivers, because many rivers issue forth into the same river. In fact, it is clearly impossible for all of this to happen, especially on the supposition that the sea has its starting-point from there [that is, from Tartarus].

Let this much, then, be our discussion [showing] that this is the place of [sweet] water and not of the sea, why potable water cannot be seen except when flowing, while the other part remains behind, and why the sea is the terminus of water rather
356b1 than its starting-point, as with the residue of all food in animals' bodies, and most of all that of the wet residue.

2.3
Salinity of the Sea

Let us speak about [the sea's] salinity, and whether the sea is always the same, or whether it did not exist or will not exist but disappear; for in fact this is what some people think.

Everyone seems to agree that the sea came to be, if indeed they suppose the whole cosmos came to be; for they make the sea come to be at the same time. So clearly, if the universe is in fact eternal, one must suppose the same about the sea too.

But to suppose that its volume is diminishing, as Democritus claims,[54] and that in the end it will disappear—this seems no different from believing the tales of Aesop. For Aesop told the story that Charybdis swallowed down [the seawater] twice: the first time she made the mountains appear, and the second time she made the islands appear, and when she swallows down the last time, she will make everything altogether dry. Telling this sort of story was fitting for Aesop who was angry with the ferryman, but is less so for those who are seeking the truth. For it is clear that the cause due to which the sea remained at the beginning, whether because of its heaviness, as some of them do claim (for the cause is obvious to see), or because of something else, is the one due to which it must persist for the rest of time too. They should say either that not even the water drawn up by the sun will come back down, or if it does come back down, that the sea must either remain behind always or for as long as the [fresh water comes back down]; and that again the potable water must first be drawn back up. The result is that the sea never gets dried out; for [before that happens] the water that ascended will descend again into the same sea. It makes no difference whether we say this happens once or many times.

If one supposes that the sun stops its spatial movement, what will be the drying agent? If, however, it is allowed to have a circular movement, whenever it approaches the earth it will draw up the potable water, as we said, and whenever it withdraws, it will release it again. But they grasped their conception about the sea from the fact that many places appear drier now than previously. We stated[55] the cause of this: this affection arises because excess water is produced over a certain period of time, and not because of the coming to be of the whole universe and its parts; and the opposite effect will occur in its turn. And when this occurs, [the area] will be dried out again. This must always proceed in a cycle in this way; for it is more reasonable to suppose this than to make the whole universe change because of these things.

Our argument has been drawn out longer than these issues warrant. But where salinity is concerned, it is impossible for those, who have made the sea come to be on one single occasion, as well as for those who make it come to be at all, to make it saline. For whether it is the remnant of all the liquid around the earth that has been drawn up by the sun that came to be the sea, or such a strong flavor were present in so large and sweet a body of water because of the sort of earth mixed in with it, nonetheless, since the vaporized water returns and its amount, at any rate, is equal, it is necessary that [the sea was saline] at the beginning as well; otherwise, if it was not saline at the beginning, it should not be saline later either. But if it was saline straight from the start, one should say what the cause is, and also why it does not undergo

54. A99a, 100 DK.
55. 352^{a}25.

the same process now, if it was drawn up then too. Further, for those who attribute the cause of salinity to the earth that is mixed in (for they claim that earth has many flavors, making the sea saline because of the mixture, when it is carried down by the rivers), it is strange that the rivers are not saline as well. For how is it possible for the mixture of this sort of earth to be so obvious in a large amount of water, but not in each of the rivers? For it is clear that the sea consists entirely in river water; for it differs from rivers in nothing else than in being saline, and this arrives by those river courses to the place into which they gather and flow.

It is likewise ridiculous, if someone says that the sea is the sweat of the earth and thinks he has said anything clear, as Empedocles did.[56] In so speaking, he has perhaps come up to the standards of poetry (for metaphor is a feature of poetry), but for knowledge of nature it is not sufficient. For it is not clear here either how the sweat becomes saline from the sweet water we drink, whether it is just by the departure of something, like the sweetest part, or by something being mixed in, just as with waters that have been filtered through cinders. But the cause appears to be the same in the case of the residue that is collected into the bladder; for in fact this residue becomes bitter and saline, although what we drink—that is, the wet component in our food—
357b1 is sweet. So if, like the water that is filtered through ash, urine becomes bitter, and that, because it carries with it the same sort of capacity that we see precipitating in vessels as salt scum, and because sweat is excreted from the flesh together with this capacity (as when some liquid, as it leaves, rinses such a thing out of the body), it is clear that in the case of the sea too the cause of the salinity is the material from the earth that is mixed with the wet.

This sort of material is produced in the body as a sediment of food due to the lack of concoction. But we must say how it came to be available in the earth: in general, how can such a large amount of water be excreted as the earth dries out and gets warm? For it could only be a small fraction of what is left in the earth. Again, why does the earth, whether a smaller or greater amount, not sweat now too, whenever it happens to be drying out? {For the liquid—that is, the sweat—becomes bitter.}[57] For if in fact it did then, it should do so now as well. But this does not appear to happen; rather, when it is dry, it then becomes wet; but when it is wet, it undergoes no such thing. So how is it possible, at the time of the first coming to be, for the earth, when it was wet, to have sweated as it was drying out? On the contrary, it is more likely, as some claim, that the sea is the remnant after most of the liquid has departed and has risen because of the sun. But it is impossible for it to sweat when it is wet.

The stated causes of salinity seem to be beyond the reach of reason. But let us say [what we think], assuming the same starting-point we did previously.[58] For since it is

56. A66, B55 DK.
57. This seems out of place in the argument.
58. 341b6–13.

laid down that there is a twofold exhalation, one wet and the other dry, it is clear that we must consider the latter as the starting-point of such things.

And, in particular, [let us speak] about what needs first to be puzzled out: whether the sea always persists because it has numerically the same parts or because its parts always change in form and in quantity, just like the air and the potable water and fire do (for each of these is always in the process of becoming, though the form of each of their masses remains constant, just as the stream of flowing waters and of flame). The following, then, is clear and convincing, that it is impossible for there not to be the same account concerning all these things. They differ in the speed and slowness of their change, but in all cases there is passing away and coming to be. However, they **358ᵃ1** all undergo these changes in an orderly manner.

Since this is the case, we must try to give our account of the cause of salinity. It is certainly evident through many signs that this sort of flavor is produced due to a mixture of something. For in [animals'] bodies, what is least concocted is saline and bitter, just as we said previously;[59] for the residue of wet food is least concocted. Sediment is always of this sort, but the sediment in the bladder is most so (a sign of this is that it is the finest-grained material; for all things that are being naturally concocted get composed). And next [to urine in being unconcocted] is sweat. The same body is excreted together [with the liquid] in these two cases, and this body produces this flavor. It is similar in things that are burned; for what the heat does not take control of becomes residue in [animals'] bodies and cinders in things that are burned. That is why some claim that the sea has come to be from thoroughly burned earth. It is strange to state the matter so, but that it comes to be from earth of this sort is true. For just as in [the animal processes that] we have discussed, so also in the whole, we must suppose that from things that naturally grow and that are continually coming to be by nature, just as from things that are burned, the remnant is earth of this sort and especially all the exhalation in the dry [earth]. For this [exhalation] is what provides the great quantity [necessary to salinate the sea]. And since, as we said,[60] the vaporous and the dry exhalations are mixed, whenever they are composed into clouds and water, some amount of this [dry] capacity must be continually enclosed, and carried back down with it when it rains. This is continually coming to be according to some regular order, to the extent that it is possible for things here [in the sublunary world] to have a share of order. We have now discussed where the salinity in water comes from.

And because of this, rains accompanied by the south wind and the first rains of fall are more brackish; for the south wind, both because of its extent and its wind,[61] makes for a very warm wind. It blows from dry, hot places, so that it has little vapor. That is why it is hot; for even if it is not so and is cold at the place from which it

59. 357ᵇ8–9.
60. 344ᵇ20–26.
61. The text here is uncertain.

starts to blow, nonetheless, as it moves along, it is hot because there is a lot of dry exhalation being enclosed with it from the nearby places. But the north wind, since it is from wet places, is vaporous. That is why it is cold. And by pushing away [the vapor] it causes clear skies here, but in the opposite [areas] it brings rain. Similarly, the south wind also causes clear skies for the areas around Libya. In the water that is being carried down, then, a lot of such [dry exhalation] is accumulated, and the rains of fall are brackish; for it is necessary for the heaviest material to be carried first. So rains, in which there is a large amount of such earth, tend downward most quickly. And the sea is hot, at any rate, because of this; for everything that is burned potentially has heat in it. One can see this in ash and cinders and the dry and wet excretions of animals: the animals that have the hottest stomach, at any rate, have the hottest excretion.

Due to this cause, then, [the sea] is continually becoming more brackish, but some part of it is continually carried up with the sweet water. (But it is less, the less salinity and brackishness there is than sweet in the rain. That is why as a whole they practically equal out.) And having made a test of it, let us say that it becomes potable by being vaporized and that whenever it is composed again, the vaporized material is not aggregated into seawater. And other things undergo the same process. For wine and all the other juices, whenever they have been vaporized and composed back into liquid, become water. For the other liquids are affections of water due to some mixture, and whatever is mixed in, makes the flavor of the juice to be such-and-such. But we should make our investigation into these things on other more appropriate occasions.[62] For now, let us say this much, that since the sea always exists, some part is continually being drawn up and becomes potable, and comes down from above in the rain having become something else, not that which was drawn up. Due to its weight it is situated underneath the potable water. And that is why the sea, like the rivers, does not fail, other than locally (for this necessarily happens equally in both domains); nor do the parts always remain the same, neither of earth nor of sea, except in terms of the entire mass. For we must also suppose the same sort of thing concerning the earth; for the one part [of the earthen material] goes up, another part comes back down with [the rain], and what stays on top and what is going back down exchange places.

That salinity resides in the mixture of something is clear not only from what has been said but also if one fashions a wax vessel and places it in the sea, having tied off its mouth in such a way that no seawater might pour in; for the water that comes in through the waxen sides becomes potable. For the earthen material—that is, what produces salinity due to the mixture—is segregated out just as through a sieve; for this is the cause of the heaviness (for saline water weighs more than potable) as well as of the viscosity. The viscosity is so much greater, that ships of the same weight in cargo almost sink in rivers, though on the sea they are moderately buoyant and

62. Perhaps in the lost *On Flavors*.

seaworthy. That is why, indeed, some who have freighted their ships in rivers have been damaged because of their ignorance. The fact that the mass is more viscous is a proof of what is mixed in: if one makes water excessively saline by mixing in salt, eggs float upon it, even if they are full. For the water becomes pretty much like mud, such a large quantity of material does the sea contain. People do the same thing concerning pickling as well.

And if there is a lake in Palestine, as some storytellers say, such that if you tie up and throw a man or a beast of burden into it, they float and do not sink under the water, this would be a proof for what has been said. For they say that the lake is so bitter and saline that there are no fish in it and that you can wash your clothes, if you just dip them in and shake them out.

All the following are signs of what has been said, that it is a certain body that makes water saline and the thing it contains is earthen. For in Chaonia there is a fountain of rather brackish water and it flows out into the neighboring river, which is sweet but has no fish. For, as the locals tell the story, when Heracles, coming with his cows from Erytheia, gave them the power, they chose the salt in exchange for the fish, which they got from the fountain. For they boil off some portion of this water, and lay it aside, and it cools and, when the liquid has vaporized off with the heat, it becomes salt crystals which are not coarse but loose and delicate like snow. It is weaker in its capacity than other sorts of salt, and it seasons dishes only when more is added, and is not as white in color. A similar sort of thing occurs in Umbria; for there is a place where reeds and rushes have grown. They burn them, throw **359b1** the cinders into water, and boil them. When some part of the water is left, this is cooled and becomes a mass of salt.

As regards the streams of rivers or fountains that are saline, we must think that the greatest number were hot at some time, then the starting-point of fire was extinguished and there still remains something like the ash and cinders of the earth they are filtered through. And in many places, there are fountains and streams of rivers that have all manner of flavors, and the cause of all of them is to be attributed to the capacity of fire that dwells or supervenes in them. For when earth is burned, it takes on various forms and appearances of flavors varying by the more and the less; for it becomes full of astringent material and ash and other such capacities, through which the sweet water is filtered and changes, and some becomes acid, like in Sicania in Sicily; for the earth there is acid-salty, and they use it like vinegar for some of their food. And there is a fountain of sour water in Lyncus, and a bitter one in Scythia. And its flow makes the whole river into which it flows bitter. The differences of these things are clear from the following: what sort of flavors come to be from what sort of blends. We have discussed these things separately elsewhere.[63]

We have now pretty much completed the major part of the discussion concerning water and the sea, due to what causes they exist always and continuously, and how

63. *Sens.* 4.

they change, and what their nature is, and again what affections they happen to produce and undergo in accord with nature.

2.4
The Material Cause of Winds

Let us discuss the winds, assuming the starting-point we have already mentioned previously. For we claim[64] that there are two forms of exhalation, the wet and the dry. The former is called "vapor," and the latter, taken as a whole, has no name, but we must use a name appropriate to a part, and call the whole something like "smoke." The wet does not exist without the dry, nor the dry without the wet, but they all get their names according to the excess [of one factor over the other].

The sun travels in a circle, and so, when it approaches, it draws up liquid by means of its heat, and when it gets further away, the vapor that has been drawn up **360ᵃ1** is composed again into water because of the cooling (that is why rain occurs more during the winter and more at night than during the day; but this does not appear to be the case, because we do not notice the nighttime rains as much as the daytime rains). So, all this water descends and is distributed over the earth, and there exists in the earth a lot of fire and a lot of heat, and the sun draws not just the liquid that rests on the surface of the earth, but also dries out the earth itself by heating it. Since the exhalation is twofold, as we have said,[65] the vaporous and the smoky, it is necessary that both occur. Among these, the exhalation that has the greater amount of liquid is the starting-point of the rainwater, as was said previously,[66] while the dry is the starting-point and nature of all the winds. And the facts themselves make clear that these things must occur in this way. For it is necessary for the exhalation to differ, and it is not just possible but necessary for the sun and the heat in the earth to produce these things.

And since the form of each is distinct, it is clear that they differ, and that the nature of wind and the nature of rainwater are not the same, as some people say.[67] For they claim that the same air, when it is moving, is wind, but when it gets composed again, is water. {As we have said[68] in our accounts prior to these, air comes to be from these [exhalations]. For vapor is wet and cold (because it is wet, it is easy to delimit; and because it arises from water, it is cold in its proper nature, just like unheated water); smoke is hot and dry. So just as with tokens, the air would be composed as wet and hot.}[69] For it is strange, if this air, which is pervasive around us all, becomes

64. 341ᵇ5–12.
65. 341ᵇ5–12.
66. 346ᵇ20–347ᵃ12.
67. Anaximenes A7.7, implied by Metrodorus of Chios A18 DK.
68. Perhaps 340ᵇ24–28.
69. This should be rejected as spurious.

a wind just because it moves, and is the wind it is, just because it happens to move from a certain direction, and not, as we supposed with the rivers that they are not just water flowing in any random way—not even if they are of significant quantity—but rather their flow must be from a spring. For this is the way it is with the winds as well; for a great quantity of air, without starting-point or source, may be moved by some great fall.

And what happens bears witness to what has been said. For because the exhalation continuously occurs, more or less forcefully, in greater or smaller quantities, the clouds and winds continuously occur, each according to its natural season; and **360ᵇ1** because sometimes the vaporous exhalation, sometimes the dry and smoky, is many times as big as the other, some years become very rainy and wet, and some are breezy and droughty. Sometimes, then, it happens that both extensive droughts and numerous heavy rains occur at the same time over a continuous district. And sometimes this happens in parts of districts; for often a whole district round about gets its seasonal rains or even more, while in some one part of it there is drought. Sometimes the opposite happens, and the whole district all around has just moderate rain or is even rather droughty, while one part of it gets a plentiful amount of rain. The cause is that for the most part the same affection is likely to extend over a wider district, because neighboring areas share pretty much the same position relative to the sun, unless they have some special difference.

Nonetheless, sometimes in some particular part the dry exhalation becomes greater, and in another the vaporous one; and sometimes the opposite. The cause of this is that each part changes over to the exhalation of the next district—for example, the dry exhalation flows in its proper district, while the wet one flows to the neighboring district or was pushed off into one of the remote areas by the winds. And sometimes, while the latter [wet] exhalation remained, the opposite exhalation did the same thing [as the wet in the previous example]. And this often occurs, as in the [living] body, if the upper stomach is dry, that the lower stomach is in the opposite condition, and when the lower stomach is dry, the upper stomach is wet and cold; it is in the same way that the exhalations undergo reciprocal exchange and change their places.

And again, after the rains, a wind usually occurs in those areas where the rains happen to have occurred as well; and the winds cease, when the rain has occurred. For these things must happen because of the starting-points we have discussed; for after it has rained, the earth dries out through the heat that is in it and the heat from above, and emits exhalations. This is the body of the wind. And whenever this sort of segregation occurs and the winds prevail, then they stop because the hot material is constantly segregated out and carried up to the upper place, and the vapor gets cooled, composed, and becomes water. And whenever the clouds are pushed together into the same place and the cold gets confined in them, water comes to be and cools **361ª1** down the dry exhalation. So when rains occur, they make the winds cease; and when the winds cease, rain occurs due to these causes.

Again, the cause is the same for most winds coming to be from the Arctic and the south. For most of the winds are north or south; for these are the only places that the sun does not reach; instead, it [just] approaches them and withdraws from them, but it always travels toward the settings and the risings. That is why the clouds are composed in the places on either side and the wet exhalation occurs when the sun advances, but when it withdraws to the opposite place, then rains and storms occur. Because of the spatial movement of the sun toward and away from the tropics, then, summer and winter occur, and the water is drawn up and [rain] is produced again. Since the greatest amount of water falls in those places toward which and away from which the sun turns, that is, the places facing the Arctic and the south, and since it is necessary that the greatest amount of exhalation occurs where the earth receives the greatest amount of water (in much the same way as smoke is produced from green wood), and this exhalation is a wind, it would be reasonable that the greatest and most dominant of the winds arise from these places. The winds from the Arctic are called "Boreae," and the winds from the south "Notoi."

As to their spatial movement, it is oblique, since they blow around the earth, though the exhalation naturally moves straight up, because the whole circle of the air follows the spatial movement [of the heavens]. That is why one might also be puzzled about which of two sources the starting-point of the winds is from, from above or from below. For the movement is from above, even before the wind blows, and the air makes it obvious, if there is cloud or mist; for it shows that the starting-point of the wind is moving before the wind has perceptibly arrived, indicating that they have their starting-point from above. And since a wind is a mass of dry exhalation from the earth moving around the earth, it is clear that the starting-point of the movement is from above, and the starting-point of the material and coming to be is from below. For the cause originates from the place where the ascending material will flow; for the spatial movement of the things more remote from the earth are in control. But at the same time [the exhalation] rises straight up from below, and what is close always has greater strength, and the starting-point of coming to be clearly is from the earth.

And it is clear also on the basis of the facts that the winds occur from many
361b1 exhalations coming together little by little, just like the starting-points of rivers, when the earth is damp. For they are all weakest at the source from which they blow, but as they proceed further, they blow vigorously. Again, the areas around the Arctic are calm and windless in the winter, that is, in that area itself. But what blows little by little and is hardly noticed as it goes forth, becomes in due course a vigorous wind.

What the nature of the wind is, and how it occurs, and again concerning droughts and rains, and due to what cause the winds cease and occur after rains, and why the north and the south winds are the most numerous, has been discussed, and in addition to these things, their spatial movement as well.

2.5
The Efficient Cause of Winds

The sun both makes the winds cease and spurs them on. When the exhalations are weak and meager, the sun with its greater heat causes the heat in the exhalation, being smaller, to fade away and disperse. Again, it first dries out the earth itself, before a concentrated segregation occurs: just as if a small amount of fuel falls upon a large fire, it is often burned up before it produces smoke. Due to these causes the sun makes the winds cease and prevents them from coming to be in the first place: it makes them cease by causing them to fade away; but it also prevents them from coming to be by quickly drying out [the earth]. That is why a calm occurs there especially around the time of the rising of Orion and lasts until the Etesian winds and their Forerunners. In general, calms occur from two causes: either because of the cold the exhalation is extinguished, for example, whenever a sharp frost occurs; or because [the exhalation] is caused to fade away by the stifling heat. And the greatest number of calm spells occur in the intermediate seasons, either because the exhalations have not yet started or because the exhalation has already issued forth and another one is not yet flowing in turn. Orion seems to be hard to discern and difficult [as a weather sign], both when it sets and when it rises, because its setting and rising occur at the change of the season, summer or winter, and because it occurs over a number of days due to the large size of the heavenly body.[70] And the changes in all [the winds] are confused due to this indeterminacy.

The Etesian winds blow after the solstice and the rising of the Dog Star,[71] not at the time when the sun is closest, nor when it is far off. They blow during the day but cease at night. The cause is that the sun is close and dries [the earth] before the **362^{a}1** exhalation is produced. But when it retreats a little, the heat of [the sun] becomes well balanced,[72] so that the solidified water melts and, as the earth is dried out by its own heat and by that of the sun, starts to produce smoke, as it were, and exhalations. But during the night they abate, because the solidified water ceases to melt due to the coldness of the nights. What is solidified does not produce exhalation, nor does what has no dry component; instead, dry material, when it has liquid and is heated, generates exhalation.

Some people puzzle about why, while steady north winds, which we call the "Etesian winds," occur after the summer solstice, no similar south winds occur after the winter solstice. This state of affairs, however, is not unreasonable. For the so-called Clear South winds occur at the opposite season, though they are not as steady. And the fact that they elude our notice spurs us to investigate. The cause is that the north wind blows from the places under the Bear, places that are full of a great deal of water

70. I.e., the constellation.
71. In July.
72. Secluding ἡ ἀναθυμίασις καὶ.

and snow. And it is when they are melted by the sun, more after the summer solstice than during it, that the Etesian winds blow. For the stifling heat occurs in this way too, not when [the sun] is closest to the Bear, but when it has had more time for warming, but is still close. Likewise, after the winter solstice the Bird winds blow. For these are weak Etesian winds. They blow less and blow later than the Etesian winds. For they begin to blow on the seventieth day [after the winter solstice], because the sun is far off and exercises less power. They do not blow as continuously, because some are at that time separated [from their point of origin] in a superficial and weak manner, while others that are more solidified need more heat. That is why they blow intermittently, until the Etesian winds blow at the summer solstice again, since a wind always has a tendency to blow from there with the utmost steadiness.

The south wind blows from the summer tropic and not from the other Bear [Fig. 1].[73] For there are two sections of the habitable earth, the one facing the upper pole, where we live, and the other facing the other pole, toward the south. They are like drums [Fig. 2]; for the lines drawn from the center of the earth cut off this sort of shape, and they make two cones, the one having as its base the tropic, the other having the ever-visible circle, and the apex being at the middle of the earth. In the same way, two other cones make sections of the earth toward the pole below. These [two sections] alone can be inhabited, and not those beyond the tropics (for [that region could have] no shadow fall toward the north, and as it is, regions become uninhabitable before the shadow disappears or shifts toward the south), nor the areas under the Bear because of cold. (And the Crown too travels in this place; for it is clearly apparent to us over our heads, whenever it is on the meridian.)

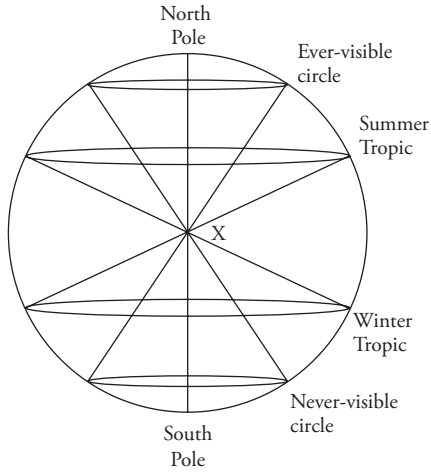

Fig. 1

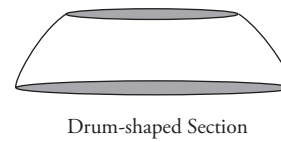

Fig. 2

73. I.e., the Antarctic region.

That is why the way [mapmakers] draft the maps of the earth is ridiculous; for they draw the inhabited world as circular, but this is impossible both on the basis of what appears to be so and on the basis of argument. For argument shows that it is bounded in breadth, but it can connect up in a circle on the basis of climate: for the heat and the cold do not run to extremes along the length, but rather along the breadth, so that unless the extent of the sea blocks it somewhere, [the length] can all be traversed on foot. The same can be shown also according to what appears to be so from sailing voyages and journeys; for the length [of the inhabitable world] is much greater than the breadth. For the magnitude [of the distance] from the Pillars of Heracles to India in comparison to that from Ethiopia to Maeotis and the places at the extremes of Scythia is greater than five to three, if one[74] calculates the sailing voyages and the itineraries, to the extent that it is possible to grasp the exactness of such things. And yet we know the inhabited world along its breadth up to the uninhabited parts: for habitation ceases on the one side because of the cold, and on the other because of the warmth. And because of the sea the places beyond India and the Pillars of Heracles do not seem to join together the entire inhabited land in such a manner as to be continuous.

Since it is necessary for there to be some place facing the other pole, just like the one we inhabit faces our pole, it is clear that everything else, as well as the position of the winds, is correspondingly arranged. So that just as there is a Boreas wind here, so they too have some such wind blowing from their Bear. This wind simply cannot make its way here, since not even our Boreas is found in the entirety of our inhabited world. For the northern wind is like a land wind. But because this inhabited district of ours lies toward the Bear, most winds blow from the north. Nonetheless, here too it fails and is not able to travel far, since the east and west winds always blow continuously in succession around the southern sea beyond Libya, like here the northern and the southern winds blow.

It is clear that the south wind is not the one blowing from the other pole. And since it is neither that one, nor the one from the winter tropic (for in that case, there would have to be another one from the summer tropic: for this is the way it will produce correspondence; but as it is, there is none, since there is clearly only one blowing from those places), it is necessary that the south wind be the wind blowing from the thoroughly burned place. That place, because of its proximity to the sun, does not have water and pasturage,[75] which will produce Etesian winds, due to the solidification. But because that place is much larger and more open, the south wind is greater and larger and warmer than the north, and travels a greater distance over here than this one there.

What the cause is, then, of these winds and how they relate to one another, has been discussed.

74. Reading ἐάν τις τούς τε.

75. "Pasturage" should perhaps be emended to "snow."

2.6
Catalog of the Winds

Let us now discuss the winds' positions, which winds are opposed to which, which sorts can blow at the same time and which ones cannot; and further, what winds happen to exist and how many they are; and in addition, the other affections that happen not to have been discussed in the particular problems.

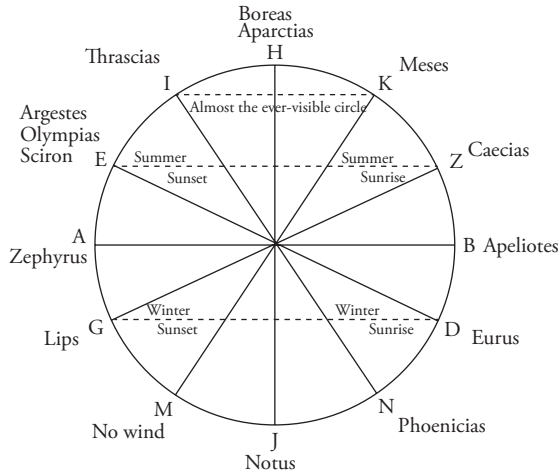

Fig. 3

It is necessary at the same time to consider the arguments about their positions on the basis of the diagram. We have drawn the circle of the horizon in order to be clearer, and that is why [our figure] is round. But we need to consider it[76] to be just the one section, the one that is inhabited by us: for we can divide up the other one in the same manner. Let us first lay down that spatial opposites are the ones most distant in space, just as formal opposites are those most distant in form. And those spatially most distant are those that lie on the diameter facing one another.

So let A be the equinoctial sunset, and let the place opposite to it, B, be the **363b1** equinoctial sunrise [Fig. 3]. And let there be another diameter cutting this one at a right angle, and let its point H be the Bear; and the opposite point facing it, J, the midday [that is, south]. And [let] Z be the summer sunrise, and E be the summer sunset, and D be the winter sunrise, and G be the winter sunset. And let a diameter be drawn from Z to G and from D to E. So, since those that are most distant in place are opposite in place, and points on the diameter are the most distant, it is necessary for these winds, which are on the diameters, to be opposites to each other.

76. Reading αὐτὸν.

The winds are named according to the position of their locations as follows: Zephyrus is from A, since this is the equinoctial sunset. Opposite to this is Apeliotes from B, since this is the equinoctial sunrise. Boreas—that is, Aparctias—is from H, since the Bear is here. And opposite to this is Notus from J, since it is midday,[77] from which it blows, and J is opposed to H, since they are on a diameter. Caecias is from Z, since this is the summer sunrise. The opposite is not the wind that blows from E, but the one from G, Lips, since this is from the winter sunset, and is opposite to it (for it lies on the diameter). Eurus is from D, since it blows from the winter sunrise, a neighbor to Notus. For this reason one often says that the "Euronoti" winds blow. Opposite to this is not Lips from G, but the wind from E, which some people call "Argestes," and others call "Olympias," and others again "Sciron." For this wind blows from the summer sunset, and alone lies on the diameter to it [that is, Eurus].

Those are the winds that lie on a diameter and their opposites. But there are others that do not have opposite winds. For the wind from I, which they call "Thrascias," [does not have an opposite,] since it is in between Argestes and Aparctias. And the wind from K, which they call "Meses," [does not have an opposite,] since it is in between Caecias and Aparctias. The diameter IK tends toward the ever-visible circle, but is not exactly so. There are no opposites to these winds, neither to the Meses (for there would be one that blows from the point M; for this is on the diameter), nor to I, Thrascias (for it would blow from N. For this point is on the diameter, unless we count the wind that blows from it for a short distance, which those who live around this place call the "Phoenicias").

These are the most dominant and distinct winds and they are arranged in this manner. The cause of there being more winds that arise from places toward the Bear than from those toward the south is that the inhabited world is oriented toward that place; and, because much more rain and snow are pushed into this part, because the other place is under the sun and its spatial movement, and when they are melted into the earth and heated by the sun and the earth, the exhalation is necessarily produced, which is greater and extends over a wider place due to this cause.

Among the winds that were mentioned, Aparctias is northern in the strictest sense, and then Thrascias and Meses. Caecias is shared between east and north. Southern winds are both the genuine one [Notus] which blows from the south, and Lips. And the eastern winds are the ones from the equinoctial sunrise and Eurus. The Phoenicias is common [to east and south]. The western winds are the genuine one [Zephyrus] and the so-called Argestes. Generally speaking, some of these are called "northern," others are called "southern." The western winds are added to the northern (for they are colder, because they blow from the sunset), and eastern winds are added to the southern (for they are hotter because they blow from the sunrise). So, since the winds are distinguished by cold and hot and warm, people give them their names accordingly. The ones from the dawn are hotter than the ones from the sunset, because the ones from the sunrise are under the sun for

77. I.e., south.

a longer time: as for the winds from the sunset, the sun leaves them faster and approaches the place later.

Since the winds are arranged in this way, it is clearly impossible for the opposite ones to blow at the same time (for they are on the diameter, and one of them will be forced to stop). But nothing prevents winds that are not positioned this way, for example Z and D, [from blowing at the same time]. That is why sometimes two winds may blow together toward the same point and be both favorable, though not from the same point nor with the same wind. Opposite winds blow especially in opposite seasons—for example, around the spring equinox, Caecias and in general the winds beyond the summer tropic, while around the fall equinox, Lips; and around the summer solstice, Zephyrus blows, while around the winter solstice Eurus. Aparctias, Thrascias, and Argestes are the winds that especially confront the others and stop them. For because their impulse is very close by, it is most of all these winds that blow numerous and strong. That is why these winds produce the clearest skies. They stop the other winds, because they blow from very close by and force their way, and because they blow away the clouds that are being composed, they produce a clear sky, if they do not happen to be at the same time too cold. [If they are too cold,] they do not produce a clear sky. If they are colder than they are big, they solidify the clouds before they push them off. Caecias is not associated with clear skies, because it bends back upon itself. So the saying goes, "drawing to himself as Caecias [does] a cloud."

The veering around [of the winds] occurs when they are made to cease by those [winds] that are next in the movement of the sun, because what is next to the starting-point is most susceptible to movement, and the starting-point of the winds moves as the sun does.

Opposite winds produce either the same or the opposite [effect]. For example, Lips and Caecias, which some call "Hellespontias," are wet;[78] but Argestes and Eurus are dry. This latter wind starts out dry but ends up wet. Meses and Aparctias are especially associated with snow; for they are the coldest winds. Aparctias and Thrascias and Argestes are associated with hail. Notus, Zephyrus, and Eurus are scorching. Caecias especially thickens the sky with clouds, Lips does so more intermittently; Caecias does so, because it bends back upon itself and because it is shared between the north and the east, so that because it is cold, it solidifies and composes the vaporizing air, while because it is eastern in its orientation, it has a lot of material and vapor which it pushes forward. Aparctias, Thrascias, and Argestes are associated with clear skies. The cause was stated previously.[79] These and Meses especially generate lightning. For because they blow from close at hand, they are cold; and lightning occurs because of the cold. For it is expelled when the clouds come together. That is why some of these same winds are associated with hail, because they solidify quickly.

78. Secluding καὶ εὖρος, ὃν ἀπηλιώτην ("and also Eurus, which some call 'Apeliotes'").
79. 364b7–10.

Cloud-wind-bursts occur mainly during the fall, then also during the spring; and **365ª1**
it is Aparctias, Thrascias, and Argestes that, most of all, occur then. The cause is that
the cloud-wind-bursts especially occur, when some winds blow and others confront
them, and these are the winds that most tend to confront the others when they are
blowing. The cause of this was also mentioned earlier.[80]

For those who live in the west, the Etesians veer around from Aparctias to Thrascias,
Argestes, and Zephyrus (for the Aparctias {. . .}[81] is a Zephyrus wind), starting from the
Bear and ending in those far off. But for those toward the east they veer toward Apeliotes.

So, let this be our discussion concerning the winds, their coming to be from a
starting-point, their substance, and their common and particular affections.

2.7
Previous Views on Earthquakes

Next, we must discuss the shaking and movement of the earth; for the cause of this
affection is the next one of its kind to be discussed. Up to the present time, at any
rate, three explanations have been handed down by three individuals: Anaxagoras of
Clazomenae and, earlier than him, Anaximenes of Miletus have made statements,
and latter than them Democritus of Abdera.

Anaxagoras claims[82] that the ether naturally travels upward, and when it hits the
lower parts of the earth and its hollows, it moves the earth; for the upper parts of
the earth are clogged because of the rain showers (since by its nature, at any rate,
the entire earth is uniformly porous). There is an upper part and a lower part of the
sphere as a whole, where the upper part is the one we happen to live upon, and the
lower part is the other.

Against this cause, perhaps one need not say anything in objection, since it is
stated in overly simple terms. For it is naive to think that the up and the down are
not so arranged that bodies having weight travel from every direction toward the
earth, while light bodies and fire travel up; especially since we see that the horizon
of the world, to the extent we know it, comes always to be different as we move—
implying that [the earth] is convex and spherical. And [it is also naive] to speak as
if it rests upon the air because of its size, and to claim that it is shaken when it is
struck from the bottom up through the whole of its extent. And in addition, he
gives no account of the affections that occur along with the earthquakes. For it is
not just any random region or season that are involved in these affections.

Democritus claims[83] that the earth is full of water and receives a lot of other **365ᵇ1**
rainwater, and that it is moved by this. For when the water becomes too much for the

80. $364^{b}3$–6.
81. There may be a lacuna in the text at this point.
82. A42.3, 12, A89 DK.
83. A97, 98 DK.

hollows to hold, it forces its way and produces an earthquake; and as the earth dries out, it draws water into empty places from those that are fuller, and the water as it is displaced, hits the earth, and thereby moves it.

Anaximenes[84] claims that the earth breaks up, as it is drenched and dries out, and that it is shaken when these broken mounds hit it. That is why earthquakes occur both during droughts and again in rainy periods. For during the droughts, as has been stated, the earth gets dried out and breaks up, and when it gets excessively wetted by rain, it falls apart.

But if this were the case, the earth should be visibly subsiding in many places. And again, what is the cause of this affection often occurring in some places that do not differ from others in point of this excess [of liquid]? And yet, they should. And, in general, those making this supposition must claim that earthquakes are always becoming weaker and that in the end the earth will stop being shaken; for what gets compacted has this sort of nature. So that if this is impossible, it is clear that it is also impossible for this to be the cause.

2.8
Aristotle's Theory of Earthquakes

Since it is clearly necessary that an exhalation is produced both from the wet and from the dry, as we said in our earlier remarks,[85] it is necessary that earthquakes occur when these things are present. For the earth is intrinsically dry, but because of rain showers, it contains a lot of liquid, so that when it is heated by the sun and the fire in the earth, wind occurs, a great deal outside and a great deal inside [the earth]. And this sometimes flows out all as a continuous whole, and sometimes it [flows] all inside, and sometimes it is divided up into portions.

So, if this cannot be otherwise, the next thing to consider would be what sort of body is the most susceptible to movement; for it is necessary for what is most naturally inclined to move and what is extremely violent to be most of all a thing of this sort. What moves fastest is necessarily what is most violent; for it hits hardest because of the speed. But what is most capable of moving through everything is the one that is most naturally inclined to pass through, and such a thing is the most fine-grained. So since the nature of wind is of this sort, wind is the most susceptible to movement of all the bodies. For whenever fire is present together with wind, it becomes flame and moves speedily. Therefore, neither water nor earth would be the cause of the movement, but rather wind is, when the exhalated wind that is outside [the earth] happens to flow inside.

That is why the largest and greatest number of earthquakes occur during periods of calm; for the exhalation, which is continuous, for the most part follows the

84. A7.8, 21 DK.
85. 341ᵇ6–10.

impulse of its starting-point, so that its impulse is entirely directed either toward the inside or toward the outside [of the earth]. But it is not unreasonable that some earthquakes occur even when wind is present; for we sometimes see several winds blowing at the same time, and whenever one of them has its impulse starting into the earth, there will be an earthquake, though there is wind. These ones become smaller in size, because their starting-point and cause is divided.

The larger and greater number of earthquakes occur at night, but those that occur during the day do so around noon. For noon is for the most part the calmest part of the day (for the sun, when it is most powerful, locks up the exhalation in the earth; and it is most powerful around noon); but nights are calmer than days because of the absence of the sun. Accordingly, the exhalation flows back in, like an ebb tide, in the direction opposite to the flood tide out, and this occurs mostly toward early dawn. For at that time, the winds naturally start to blow too. So if their starting-point happens to shift about, like the Euripus, toward the inside [of the earth], it produces a more violent earthquake because of the quantity.

Further, the most powerful earthquakes occur around the sorts of places where the sea is subject to flow or the ground is porous and cavernous, and that is why [they occur] around the Hellespont, Achaea, and Sicily and around these places in Euboea. For the sea seems to pass through channels under the ground, and that is why the hot springs around Aedepsus have also been produced. And earthquakes occur especially around the places that were mentioned because of the constriction of space; for the wind, the one that naturally vents forth from the earth, though it is violent, is pushed back into the earth[86] because of the great mass of the sea that is brought to bear upon it. And the regions whose lower places are porous receive a great deal of wind and are more subject to earthquakes. **366b1**

But they occur especially during spring and fall and in rainy and droughty conditions due to the same cause; for these seasons are most productive of wind. For the summer and the winter—the latter because of the frost, and the former because of the warmth—produce immobility; for the latter is too cold and the former is too dry. And in droughts the air is full of wind; for this is just what a drought is, when the dry exhalation becomes greater than the wet. But in excessively rainy periods, more exhalation is produced inside the earth. And when this sort of segregation is enclosed in narrower places and forced into a smaller place because the hollows are filled with water, and when the [wind] starts to prevail because a great amount of material is being compressed into a small space, the wind flows in forceful movement and strikes against the earth.

For we must think that, just as in our bodies, the enclosed capacity of the wind is the cause of shivers and pulsations, so also in the earth the wind does much the same thing, and that one mode of earthquake is like a shiver and another is like a pulse; and just as often happens after urination (for something like a shiver runs through the body as concentrated wind exchanges place from the outside in), so this also occurs

86. Secluding καὶ.

with the earth. And we must get a theoretical grasp on what capacity the wind has, not only from the things that occur in the air (for in this case one could well suppose that they are capable of doing such things because of their magnitude), but also from the things in the bodies of animals. For convulsions and spasms are movements of wind, and they have so much power that many people, though they try at the same time to apply force, are unable to overcome the movement of those afflicted. So—to liken bigger things to small—we must think that such a thing occurs in the earth too.

And signs of these things are also present to our perceptual modalities in many ways. For in some places, the earthquake does not cease, until the wind that moves it has clearly broken out into the place above the earth, like a cloud-wind-burst, and
367ᵃ1 departed, as for example came to be recently around Heracleia in Pontus, and earlier around the island of Hiera (this is one of the so-called Aeolian Islands). For there a part of the earth swelled up, and a hill-shaped mass rose up with a noise; and finally, when it ruptured, a great amount of wind issued forth and it emitted embers and ashes and entirely covered the nearby city of the Liparians with ash and reached some of the cities in Italy. Still today, it is clear where this blast occurred. In fact, we must think that this is the cause of the fire that occurs in the earth: when the air is first broken into small pieces, [the wind] is struck and ignited.

And what occurs around these islands provides a proof that winds flow under the earth; for whenever a wind is going to blow from the south, it first provides a sign in advance. For the places, from which the blasts are produced, resound because the sea has been pushed far away [by the blast], and then the blast from the earth is pushed back inside again by the sea at precisely the point where the sea meets it. And it produces a noise without an earthquake, because of the spaciousness of the places (for it overflows outside into the yawning gulf) and because of the small quantity of air that is pushed back.

Further, it is a sign of the cause mentioned that, in the absence of cloud, the sun becomes hazy and rather faint, and that sometimes there is a freezing calm before early dawn earthquakes. For the sun must be hazy and faint when the wind, which dissolves and disaggregates the air, starts to subside into the earth; and at dawn and first light there must be calm and cold. For calm must result for the most part, as was said previously,[87] since the flow of the wind has shifted toward the inside of the earth, and more so before bigger earthquakes: for if [the wind] inside and [the wind] outside are not pulled apart from one another, but move spatially together in a concentrated mass, a greater force must result. And the cold occurs because the exhalation, which by nature and intrinsically is hot, turns inside [into the earth].

Winds do not appear to be hot, because they set the air in movement, which is full of a great deal of cold vapor, just like breath[88] when it is blown through the mouth.
367ᵇ1 For it is hot from near at hand, just as when we breathe with the mouth wide open, but it is not as obvious because of the small quantity, while from far away it is cold

87. 366ᵃ5–8.
88. Rejecting the addition of τὸ.

due to the same cause as the winds. So when this sort of capacity [the dry exhalation] departs into the earth, the vaporous flow, coming together because of the liquid, produces cold, in the places in which this affection happens to occur.

The same cause is also the cause of a sign that tends to occur sometimes before earthquakes. For either in broad daylight or a little after sunset, when the sky is clear, a long, delicate, little cloud appears stretched out, like a long, very straight line, since the wind has faded away because of its removal [into the earth]. A similar thing also happens at sea near the shore. For whenever the swell of the sea casts [waves] ashore, the waves become very massive and crooked; but whenever there is a stillness, because the segregation is small, the waves are delicate and straight. So what the sea does in the vicinity of the land, the wind does with the mist in the air, so that whenever there is calm, a cloud is left behind, altogether straight and delicate, as if it were a wave of air.

Due to these things too an earthquake sometimes happens to occur around the time of the eclipse of the moon. For when the occlusion is already near, but while the light and the heat from the sun have not yet altogether gone from the air, but have already faded away, a calm occurs, as the wind shifts its place into the earth, and this produces the earthquake prior to the eclipses. For winds often also occur before eclipses: at nightfall before eclipses that occur at midnight; and at midnight before dawn eclipses. This occurs because the heat from the moon has faded at a time, when its spatial movement is already close to the place where, under the circumstances, the eclipse will occur. But when that by which the air is restrained and at rest, is relaxed, the air moves again, and wind occurs, and it does so later when the eclipse is later.

When a powerful earthquake occurs, it does not stop shaking immediately or all at once, but at first it continues often up to around forty days, and later earthquakes are in evidence for one or two years in the same places. And the amount of wind and **368^{a}1** the configuration of the places through which it flows are the cause of the magnitude [of the earthquake]. For wherever it meets some obstruction and does not easily pass through, it causes the greatest shaking and necessarily gets trapped behind in confined places, like water in a vessel that cannot escape. That is why, just as in [an animal's] body, the pulses do not cease suddenly or quickly, but only gradually, as the affection fades, so the starting-point from which the exhalation arose and the impulse of the wind clearly did not immediately consume the entirety of the material, from which it produced the wind we call an "earthquake." So until the rest of it is consumed, there is bound to be shaking, albeit more gentle, until the exhaled material becomes too slight to be able to impart any obvious movement.

The wind also produces the noises that occur under the earth including the ones before the earthquakes; and even without earthquakes noises have been observed to occur in certain places under the earth; for just as the air emits all manner of noises when it is being beaten, so it does when it itself is doing the beating; for it makes no difference; for in every case what strikes is itself also struck at the same time. And the noise precedes the movement, because the noise is made of more delicate parts and is better able to make its way right through than the wind. And whenever the

wind, because of its delicacy, is too slight to move the earth, it is incapable of moving it because it easily penetrates; but because it meets with masses, solid and hollow and of all manner of shapes, it emits all manner of sounds, and as a result the earth sometimes seems to bellow, as the tellers of monstrous tales say.

We have also seen water break out when earthquakes occur, but this does not mean that the water is the cause of the movement [of the earthquake]; rather the wind does the moving, whether it is on the surface or forces its way from below (just as the winds are the cause of the waves and not the waves the cause of the winds), since someone might assign the earth as a cause of the affection as well; for the earth, when it is shaken, is overturned, just as water is (for the pouring out of water is a form of overturning). But both these things are causes as matter (for they undergo affections but are not active), while the wind is cause as a starting-point.

Where a wave occurs at the same time as an earthquake, the cause arises whenever the winds are opposed to one another; and this occurs whenever the wind that shakes
368b1 the earth is unable fully to push the sea away, because it is being moved by another wind; but by pushing the sea forward and drawing it back, it gathers together a great amount of sea into the same space. For when this wind has been overcome, the sea is necessarily pushed into a concentrated mass by the opposite wind, then breaks out and produces the tsunami. This happened around Achaea too.[89] For the south wind was outside, and the north wind was there, and during a calm, as the wind was flowing inside, a wave and an earthquake came to be at the same time, and more so because the sea did not give vent to the wind whose impulse was initiated under the earth, but rather blocked it. For as they forced one another, the wind produced the earthquake, and the subsidence of the wave produced the tsunami.

Earthquakes occur here and there on the earth, and often in a small place; but the winds do not. They occur here and there, whenever the exhalations in the place itself and the neighboring place join together into one, just as we claimed[90] that localized droughts and heavy rains occur. And the earthquakes occur in this manner too, but the winds do not; for some things have their starting-point in the earth, so that all the exhalations have an impulse toward one place; but the sun cannot similarly make the upper exhalations—whenever they get their starting-point of movement from the spatial movement of the sun—to flow into one area according to the particular differences of the places.[91]

Whenever there is a lot of wind, it moves the earth like a shiver, side to side. But occasionally and in some [specific] places, it occurs up and down, like a pulse. That is why only rarely does the earth shake in this manner; for it is not easy for a lot of starting-points to collect in this way; for the disaggregation occurs along the length many more times than along the depth. And wherever such an earthquake occurs, a mass of

89. In 373–2 BC.

90. 360b17–26.

91. Reading ὁ δ' ἥλιος οὐχ ὁμοίως δύναται τὰς μετεώρους—ὅταν ἀρχὴν λάβωσιν ἀπὸ τῆς τοῦ ἡλίου φορᾶς—ὥστε ῥεῖν ἤδη κατὰ τὰς διαφορὰς τῶν τόπων ἐφ' ἕν.

stones comes to the surface, just as with things being thrown up in winnowing fans. For when an earthquake came to be in this way, the [land] around Sipylus and the so-called Phlegraean plains and the area around Liguria were overturned.

Earthquakes occur less on the islands of the sea than on those close in to land; for the mass of the sea cools the exhalations and blocks them by its weight and brings force upon them. And again, it flows and is not shaken, when mastered by the winds. And because it extends over a great space, the exhalations occur not into it but out of it, and the exhalations from the earth follow them. But the islands near the mainland are a part of the mainland; for what is in between, due to its smallness, has no capacity. And it is not possible to move the islands out at sea without moving the whole sea, by which they happen to be surrounded.

We have now discussed pretty much the most important issues concerning earthquakes, what their nature is, due to what cause they occur, and the other circumstances surrounding them.

2.9
Thunder and Lightning

Let us discuss lightning and thunder, and again tornados, fire-tornados, and lightning bolts; for we must suppose that there is the same starting-point for all of these.

For since the exhalations are twofold, as we have said,[92] the wet and the dry; and since the aggregation has both of these potentially and is composed into a cloud, as was said previously;[93] and further, since the composition of the clouds becomes thicker toward the extreme border (for where the hot part disaggregates and departs toward the upper area, the composition must be thicker and colder there, which is why the lightning bolts and the cloud-wind-bursts and all such like travel downward, and yet everything that is hot naturally travels upward; but it is necessary for the squeezing out to occur in the direction opposite to the thickness, like pips popping out from between the fingers; for these things, though they are heavy, often travel upward)—the excreted heat is scattered across the upper place, and however much dry exhalation is enclosed during the change as the air cools, is excreted as the clouds come together, and as it is spatially moved by force and falls upon the surrounding clouds, it produces an impact, whose noise is called "thunder." The impact occurs in the same way, to compare a little affection with a bigger, as the noise that occurs in a flame, the noise some call "Hephaestus' laugh," others call "Hestia's laugh," while others call it their "threat." It occurs whenever an exhalation is contracted and carried toward the flame, when the wood is broken and dried. For in clouds likewise, the wind gets excreted, strikes against the dense clouds, and produces thunder. And

92. E.g., $341^{b}6$–10.
93. $341^{b}36$–$342^{a}3$, $346^{b}23$–31, $358^{a}21$–6, $359^{b}29$–34.

369ᵇ1 all manner of noises occur due to the irregularity of the clouds and the hollows in between, where their density lacks continuity.

This, then, is what thunder is, and it occurs due to this cause. And the wind that is squeezed out, burns for the most part with a delicate and weak flame, and this is what we call "lightning," wherever wind, driven out, as it were, is seen to take on color. It occurs after the impact and later than the thunder, but it appears to occur before, due to sight coming before hearing. This is clear in the case of the rowing of triremes; for as the crew is already bringing back their oars, the first noise of the striking of the oars arrives.

And yet some people say that the fire occurs *in* the clouds. And Empedocles claims[94] that this fire is the rays of the sun that are enclosed [in the cloud]. Anaxagoras says[95] that it is the part of the upper ether [that is enclosed] (which he calls "fire"), and which has been brought down below from above. [They say that] the radiance of this fire is lightning, and the noise of the extinguished fire and the hissing is thunder, on the grounds that it occurs just as it appears, and that the lightning is before the thunder.

But the enclosing of the fire makes no sense in either way, but especially the drawing down of the ether from above. For a cause must be stated for what naturally moves spatially upward moving downward, and why it is that this occurs in the sky only when it is cloudy, and not continuously so. It does not occur when [the sky] is clear. Indeed, this [explanation] seems to have been stated altogether offhandedly. Similarly, it is not persuasive to claim that the heat from the rays that is intercepted in the clouds is the cause of these things. For this account is stated without sufficient care; for it is necessary that the cause be something separate and determined in each case, a cause for thunder, a cause for lightning and so on, and they should occur accordingly. But this account is completely different; for it is as if someone were to think that rain and snow and hail were previously present and later excreted, and did not come to be, since the aggregation always produced each of them as if they were at hand. Likewise, one must suppose that rain, snow, and hail are aggregations and that thunder and lightning are disaggregations, so that if one of the two does not come to be but exists [beforehand], the same account will fit both cases. And as for the interception, why would one claim anything different from what happens in the case of denser media? For water also comes to be hot by the sun and fire. Nonetheless, when the vapor comes back together and the water is cooled and solidified, no ejection occurs such as they claim. And yet it should, at least according to the proportion of the magnitude [of the vapor]. And the wind that comes to be in [the cloud] because of the fire produces a boiling, which cannot be residing previously; nor do they make the noise a boiling but a hiss. But a hiss too is a small boiling; for wherever what makes contact prevails by being extinguished, it produces the noise by boiling.

And there are some, like Cleidemus, who claim that lightning does not exist, but is an appearance, comparing the affection to like what happens when one strikes the

94. A63 DK.
95. A1.9, A42.11, A84 DK.

sea with a rod; for, during the night, the water clearly sparkles. So, he claims, when the liquid in the cloud is struck, the lightning is the appearance of the brightness. These people were not yet acquainted with the [current] beliefs about reflection, which seems to be exactly the cause of this sort of affection; for the water appears to sparkle when struck, because the ray of sight is reflected from it toward some shining body. That is why this occurs more at night; for during the day, it does not appear, because the greater light of the day makes it invisible.

These are the things, then, that are said about thunder and lightning by others, some saying that lightning is a reflection, others that lightning is the radiance of fire and thunder is its extinction, while the fire does not come to be in each of these affections but is present [in advance]. But we claim that the same nature is a wind upon the earth, earthquake in the earth, and thunder in the clouds. For all these are the same in substance—a dry exhalation, which when it flows in a certain way is a wind, in another way it produces earthquakes, and as it shifts and disaggregates in the clouds and the clouds come together and aggregate into water, it is thunder and lightning and the other things too, which are of the same nature as these. We have now discussed thunder and lightning.

BOOK 3

$370^{b}1$

3.1
Tornadoes and Fire-Tornados

Let us continue in the way that we have already established, and speak about the remaining effects of this segregation.

For this wind, when it is segregated out little by little and is dispersed here and there, occurs in frequent gusts, and is composed of finer-grained parts, produces thunder and lightning. But if it is concentrated and denser, and is segregated out with less fine-grained parts, a cloud-wind-burst occurs. That is why it is violent (for the speed of the segregation produces the strength).

Whenever a lot of continuous segregation accompanies it, the phenomenon occurs in the same way as when its impulse starts back to the [tendency of the] opposite [exhalation];[96] for then rain and a mass of water is produced. Both of these are potentially present in accord with their matter, and, whenever the starting-point of one of the two capacities is produced and aggregates, the aggregation of whichever material is present in the greater amount follows, and becomes either rain or, in the case of the other exhalation, a cloud-wind-burst.

And whenever the wind segregated out in the cloud strikes against another, as when a wind forces its way from an open area into a narrow space, in gateways or streets (for it

96. Cf. $360^{b}15–26$.

often occurs in such places, when the first part of the flowing body is pushed out of the way—because of a body that does not yield, either because of its narrowness or because of counter-winds—that a circle and whirlwind occur; for what is in front prevents it from moving forward, while what is behind pushes it on; so it is forced to move spatially sideways, where it is not blocked, and each part in turn does likewise, until it becomes a unity, and this is a circle; for the shape for which there is one spatial movement must itself be a unity). Due to these things, then, whirlwinds occur on the earth; and likewise in the clouds at their starting-point, except that just as, when a cloud-wind-burst occurs, it is continually segregated out from the cloud[97] and a continuous wind occurs, so here a continuous cloud always follows. But due to its density, the wind cannot be segregated out from the cloud, and turns in a circle at first for the stated cause, and is carried downward because of the continuing condensation of the clouds where the hot material is ejected.

And this affection is called a "tornado," if it is uncolored, being a wind that is like an unconcocted cloud-wind-burst. Tornados do not occur along with north winds, nor does a cloud-wind-burst occur when the winds are snowy,[98] because all these things are wind, and wind is a dry and hot exhalation. So the frost and cold, because of their mastery, immediately extinguish the starting-point [of wind] as it is still coming to be. And it is clear that they are mastering; for otherwise there would be no snow, nor would the liquid be from the north; for these things occur when the cold is mastering. A tornado occurs when the cloud-wind-burst that is in the process of coming to be is unable to get segregated out from the cloud. And it remains in existence because the whirlwind is obstructed, as the spiral travels toward the earth, dragging the cloud along with it, and is not able to escape it. But where it blows forth along a straight path, here it imparts movement because of its wind, and with its circular movement it turns and carries up whatever it encounters in its violence.

Whenever it is drawn down and bursts into flames (this happens if the wind becomes more finely grained), it is called a "fire-tornado." It also causes the air to ignite and take on color because of the fire.

And if within the cloud itself a great deal of fine-grained wind is squeezed out, this becomes a lightning bolt: if it is very fine-grained, and does not scorch because of its fine-grainedness, it is what the poets call "bright white," but if it is less fine-grained, and scorches, it is what they call "sooty."[99] For the former travels because of its fine-grainedness, but due to its speed it passes through before it burns it thoroughly or blackens it by lingering on it. But the slower one causes coloration, but does not burn, and instead first [passes through]. That is why some things, upon resisting, suffer some affection, while others do not resist and suffer nothing, as in the case of the shield—the bronze trimming was melted, while the wooden part suffered no affection. Because of the rare quality [of the material], the wind first filtered through and passed out. And in the same way, it does not burn through clothes, but makes them like a tattered rag.

97. Reading τοῦ νέφους.
98. Reading νιφετῶν ὄντων.
99. Homer, *Iliad* 8.133, *Odyssey* 23.330, 24.539.

So it is clear from such considerations, at any rate, that all these things are wind, and sometimes we can see it with our own eyes too, as with the sort of thing we saw in the burning of the temple at Ephesus;[100] for the flame was drawn apart and carried continuously in many directions. For it is evident that both smoke is wind and smoke burns, as we have stated elsewhere previously;[101] and whenever [fire] moves in a concentrated way, then it is clearly seen to be wind. So what is apparent in the case of small conflagrations, the very same thing came to be in that case too, and much more strongly, because a great deal of wood was burning. So when the wood cracked, which was the starting-point and source of the wind, a great deal of it made its way in a concentrated fashion where it blew outward and was carried upward aflame. As a result, the flame appeared to travel and to fall upon the houses. For we must think that in every case wind both follows the lightning bolts and goes in advance, but it is not seen because it is uncolored. That is why the object, which [the lightning] is going to strike, moves before being struck [by the lightning itself], since the starting-point of the wind strikes it first. And thunder splits things not by its noise, but because the wind that produces the strike and the one that produces the noise are segregated out at the same time. And if it strikes, it causes the split but does not burn.

We have now spoken about thunder and lightning and cloud-wind-burst, and again about fire-tornados and tornados and lightning bolts, [showing that] they are all [different sorts of] the same thing, and how all of them differ.

3.2
Phenomena of Reflection

Let us discuss the halo and the rainbow, what each of them is, and due to what cause each of them occurs, and also parhelia[102] and rods; for all these things occur due to the same causes as each other. But it is necessary first to grasp the affections and the circumstances associated with each of them.

A halo often appears as an entire circle. It occurs around the sun and moon and the other bright heavenly bodies (*astrôn*), and again no less during the night than during the day, around midday or afternoon, but less often at dawn and sunset.

A rainbow never occurs as a circle, nor any section greater than a semicircle. At sunset and sunrise the circle is the smallest while the arc is the greatest; and when the sun is higher and the circle greater, the arc is smaller. After the fall equinox, during the shortening days, it occurs during every hour of the day, but during the summer days, it does not occur around midday. Nor, in fact, do more than two rainbows occur at the same time. And each of them has three colors, and the colors are the same and equal in number to one another, but the colors on the outside rainbow are dimmer and are

100. 356 BC.
101. 341ᵇ21.
102. Also known as sun dogs or mock suns.

reversed in their placement. For the inside rainbow has its first circumference, the biggest one, crimson, while the outer one has its smallest circumference, the one nearest to the [inside rainbow], crimson, and the other circumferences are in corresponding order. These colors are pretty much the only ones that painters cannot produce. For they themselves mix some colors, but crimson, green, and purple are not produced by mixing. But the rainbow has these colors. What is between crimson and green often appears yellow.

Parhelia and rods always occur on the sides [of the sun] and neither above it nor near the earth, nor opposite [the sun], nor in fact at night, but always around the sun, and again either when it is rising or descending, and mostly around sunset. At zenith it occurs only rarely, if at all, as once happened in the Bosporus. For through the whole day two parhelia rose together [with the sun] and persisted right up to sunset.

These are the circumstances surrounding each of them. The cause of them all is the same; for all these things are reflections. But they differ in their manner and their source, and how the reflection happens to occur toward the sun or some other bright body.

A rainbow occurs during the day; but according to what the ancients used to think, no rainbow occurs from the moon at night. This thought was imposed on them because of the rarity of the occurrence; for it escaped their notice; for it does occur, though seldom. The cause is that we fail to notice colors in the darkness, and it is necessary for many other circumstances to coincide, and for all of these to occur on one single day in the month; for it must occur at the full moon, if it is going to happen, and then when the moon is rising or setting. That is why we have only encountered it twice in over fifty years.

That the ray of sight is reflected, just as it is from water, also from the air and from everything that has a smooth surface, we must be persuaded of from the facts proved about sight, and also that in some mirrors the shapes [of the objects] appear, but in others only the colors. Small mirrors, and those that have no perceptible division, are
372b1 of this sort; for the shape cannot appear in these (for otherwise, it will appear to be divisible; for every shape seems at the same time to be a shape and to be divisible); and since it is necessary for something to appear, but shape cannot, it remains that only the color appears. The color of bright objects sometimes appears bright, but sometimes, either because of the mixture [with the color] of the mirror or the weakness of our sight, it produces the appearance of a different color.

Let this be what has been grasped theoretically by us about these things in our proofs concerning perception. That is why we may explain some things but make use of others as givens.

3.3
The Halo

First, let us speak about the shape of the halo, why it becomes a circle, and why [it appears] around the sun or the moon and similarly around any of the other heavenly bodies; for the same account will fit all cases.

A reflection of the ray of sight occurs when air and vapor are being composed into cloud, if the composition happens to be even and made of small parts. That is why this composition is a sign of rain; but [when it is being] pulled apart or caused to fade away, the fading away is a sign of good weather and the pulling apart a sign of wind. For if it is neither caused to fade away nor pulled apart, but is allowed to attain its nature, it is likely a sign of rain; for it is clear that at this point the composition becomes of such a sort that it achieves the continuous density necessary to become rain. That is why these compositions become of a blacker shade than the others. But whenever they are pulled apart, it is a sign of wind; for the dispersal occurs due to a wind that already exists but is not yet present. And there is sign of this in that the wind occurs from where the pulling apart takes control. And when it is caused to fade away, it is a sign of good weather; for if the air is not in a state to master the enclosed heat nor to proceed to rainy density, it is clear that the vapor has not yet separated from the dry and fiery exhalation. And this is the cause of good weather.

We have now described the condition of the air under which a reflection occurs. The ray of sight is reflected from the mist that is being composed around the sun or the moon. That is why the halo does not appear opposite [the sun], as the rainbow does. And since the ray of sight is reflected equally from all directions, the halo must be a circle or a part of a circle. For equal lines will always be bent from the same point to the same point upon the line of a circle [Fig 4].

373^{a}1

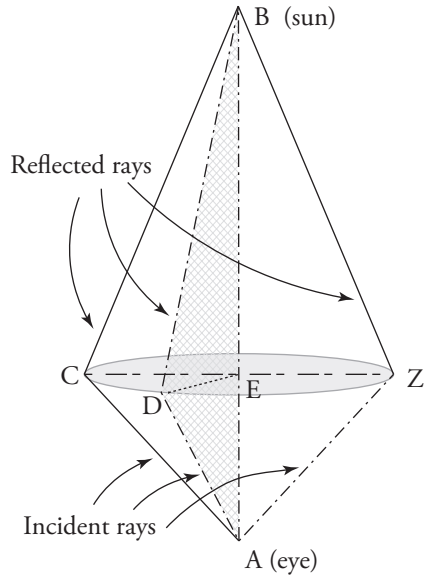

Fig. 4

For let the lines ACB, AZB, and ADB be bent from the point A to the point B. And let lines AC, AZ, and AD be equal to one another, and the lines to B equal to one another, that is, lines CB, ZB, and DB. And let line AEB be joined, so that the triangles

are equal; for they are on the equal line AEB. And let perpendiculars be drawn to AEB from the angles: from C the line CE, from Z the line ZE, and from D the line DE. These, then, are equal; for they are all in equal triangles and in a single plane; for they are all at right angles to AEB and touch at one point, E. Therefore, the line drawn will be a circle, and the center will be E. B is the sun, A the [organ of] sight, and the circumference around CZD is the cloud from which the ray of sight is reflected to the sun.

It is necessary to suppose that the mirrors are continuous. But because of their smallness, each is invisible; but the composite of all of them seems to be a unity because of their continuity. It appears as white, that is, the sun, appearing continuously in each of the mirrors in a circle, as long as it has no visible divisions, and rather near the earth, because it is relatively calm; for where there is wind, there is clearly no stillness. The circumference next to this is comparatively dark, taking on a darker appearance because of [the other's] whiteness.

Halos often occur around the moon because the sun, which is hotter, more quickly dissolves the compositions of the air. And they occur around the stars due to the same causes, but are not signs [of weather] in the same way, because the compositions they make apparent are altogether small and not yet productive [of rain].

3.4
Rainbows

It was said previously that the rainbow is a reflection. But let us now discuss what sort of reflection it is and how and due to what cause each of the circumstances surrounding it occurs.

A ray of sight is clearly reflected from all smooth surfaces, and among them are both
373[b]1 air and water. Reflection occurs from air whenever it happens to be getting composed. But air often produces a reflection even without a composition because of the weakness of the ray of sight. This affection, for example, once happened to someone whose sight was weak and not sharp; for an image appeared to move in front of him continually as he was walking, looking at him face to face. He was affected in this way because the ray of sight was being reflected to him; for the ray of sight was so altogether weak and delicate because of his affliction, that even the nearby air came to be a mirror—as the far off and dense [air is a mirror]—and [the ray of sight] was not able to push it off. That is why headlands appear as drawn up in the sea, and the magnitudes of all things appear bigger whenever the Eurus winds blow, and also things in the mist, for example, the sun and the stars, [appear bigger] as they rise and set than when they are at midday.

There is reflection especially from water, and more still from what is starting to become water than from air; for each of the parts, from which droplets are produced when their parts get composed, must be a mirror more than mist is. And since it is clear and was said previously[103] that in such mirrors the color alone appears, while the

103. 372[a]29–[b]11.

shape is unclear, it is necessary—whenever it begins to rain and the air in the clouds is already getting composed into droplets, but it is not yet raining, if the sun or some other body is opposite and so bright that the cloud becomes a mirror and a reflection occurs toward the bright body opposite—that an appearance of color, and not of shape, occurs.

Although each of the mirrors is small and invisible, because the continuity of the magnitude of all of them is visible, it is necessary that a magnitude of the same color appears continuous; for each of the mirrors produces the same color as the continuous [whole], so that, since these things can occur, whenever the sun and the cloud are in this state and we are in between them, there will be some image because of the reflection. In fact, it is evident that the rainbow occurs at that time, and not when circumstances are different.

So it is evident that the rainbow is a reflection of the ray of sight to the sun. That is why it always occurs opposite [the sun], while the halo occurs around the sun. And yet both are reflections. But the variety of their colors is different; for the former reflection is produced from rain and black [surfaces] and also from a distance, while the latter from closer and from air, which is whiter by nature. The bright object appears crimson through the black or in the black (for it makes no difference); and it is possible to see how the fire of green wood has a red flame because the fire, though it is bright and white, is mixed with a lot of smoke. Through mist and smoke, the sun appears crimson as well. That is why the first reflection [that is, the first band] of the rainbow appears to have such a color (for the reflection is produced from small drops), while that from the halo does not. (Concerning the other colors we will speak later.[104]) And again, such a composition does not linger long around the sun itself, but it either rains or dissolves. But [in the reflections] on the opposite side, some time passes while the rain is coming to be; for if this did not happen, the halos would be colored, just like the rainbow. As it is, however, nothing occurs with this sort of appearance, neither as a whole, nor in a circle but small and only partly (they are called "rods"), since if a mist were being composed of the sort that would be produced from rain or some other black surface, as we say, the rainbow would appear in its entirety, just like around a lamp flame.

For a rainbow occurs around lamps for the most part when there is a south wind during the winter, and it is especially clear for those who have wet eyes; for the ray of sight of these people is reflected quickly because of its weakness. And the rainbow is produced from the liquid in the air and from the soot that flows from the flame and is mixed with it; for it is at that time and due to the blackness, that the mirror is produced; for the soot is smoky. The light of the lamp is not white, but appears as purple, in a circle and rainbow-like, and not crimson; for the reflected ray of sight is slight, and the mirror is black. And as far as their position is concerned, the rainbow associated with oars being drawn back out of the sea occurs in the same way as rainbows in the sky, though their color is more like that around lamps; for it makes its appearance

104. $374^{b}7$–$375^{b}15$.

with a purple rather than crimson color. And the reflection occurs from very small but continuous drops. And these are rain that has been already utterly separated.

[A rainbow] also occurs if one sprinkles delicate drops into a place whose position is turned toward the sun and which is occupied by the sun in one place, but in another is in shadow; for in this sort of place, if someone sprinkles water inside, a rainbow appears to one who stands outside, where the rays cross over and produce shadow. The manner [of the rainbow] and its color are similar to that associated with oars, and their cause is the same; for the sprinkler uses his hand as an oar.

That it is this sort of color will be clear at the same time concerning the appearance of the other colors as well from the following considerations. For it is necessary for us to understand and lay down, as was said,[105] first, that in a black medium or through a black medium something bright produces a crimson color; second, that the ray of sight as it is extended becomes weaker and slighter; and, third, that the black is a sort of negation; for it appears black because of the failure of the ray of sight. That is why all things appear blacker from a distance, because the ray of sight does not reach them.

Let us get a theoretical grasp on these things in light of the circumstances concerning perception. For the accounts of these things are special to those. But for now, let us say as much about them as is necessary. It is due to this cause that things far away as well as the things in mirrors appear blacker and slighter and smoother, and clouds appear blacker to those looking into water than into the clouds themselves. This is altogether obvious; for because of the reflection they see with a reduced sight. And it makes no difference whether the object of sight changes or the ray of sight does; for either way it will be the same. In addition, we must not lose sight of this either: for it happens that, whenever a cloud is near the sun, nothing appears colored to the person who is looking at it, but rather it appears to be white; for one viewing this very thing in the water, however, it has some rainbow coloring. It is clear, then, that just as the ray of sight, when it is bent because of weakness, makes the black object appear blacker, it also makes the white less white and brings it closer to the black.

The stronger ray of sight changes it to the crimson color, while the next changes it to green and the one still weaker to purple. No further color than this appears, but they come to completion in these three, just as with most other things; for the change to the other colors is imperceptible. That is why the rainbow appears tricolor, both the one and the other, though in an opposite order. The first, then, has the crimson outside; for from the largest circumference the greatest ray of sight falls toward the sun, and the outside is the biggest. The next and the third circumference are proportional, so that if we have described the facts concerning the colors of the appearance well, it is necessary that it be tricolor and make use of these colors alone. The yellow appears because of the two colors appearing next to each other; for the crimson appears white next to the green. A sign of this is that the rainbow becomes most unmixed in the blackest cloud, and in such conditions the crimson appears more yellow. The yellow color in the rainbow is in between

105. 374ª3–8.

the crimson and the green color. So, due to the darkness of the cloud round about, the whole of the crimson part appears white; for it is white in relation to them. And again, it occurs when the rainbow is close to being completely faded away, when the crimson is being dissolved; for the cloud, which is white, falls up against the green, and changes over to yellow. The rainbow from the moon is the best sign of these things; for it appears altogether white. And this occurs because it appears in the dusky cloud and during the night. So just like "fire upon fire," black next to black makes what is slightly whiter appear altogether white. And this is the crimson. And this affection becomes obvious in the case of embroidered flowers on garments too; for in weavings and embroideries there is an indescribable difference in appearance when one color is placed next to another, for example, purple against white or black wool, and again in this or that light. That is why embroiderers say that they often make errors about the colors when they work by the light of the lamp and pick up one color rather than the other.

We have described why the rainbow is tricolor, then, and why it appears to consist in these colors alone. The rainbow that surrounds the first is a twin but dimmer in color, and it displays the opposite placement of colors due to the same cause; for the ray of sight, because it is stretched out to a greater length, views the object in this case in the same way as it does the remoter object. So the reflection from the outside rainbow becomes weaker, because the reflection produced is further off, so that, when it strikes **$375^{b}1$** in its diminished state, it makes the colors appear dimmer. And in reverse order, because more of the ray of sight falls upon the sun from the smaller circumference, the inside one; for since it is nearer to the ray of sight, it is reflected from the circumference closest to the first rainbow. And the smallest circumference is the nearest in the outside rainbow, so that it itself will have the crimson color. And the next and the third will be proportional.

The outside rainbow is at B [Fig. 5]; the inner one, the first, is at A; and the colors, at C the crimson, at D the green, and at E the purple. The yellow appears at Z. But three or more rainbows do not occur, because even the second becomes dimmer, so that the third reflection becomes altogether weak and is unable to reach the sun.

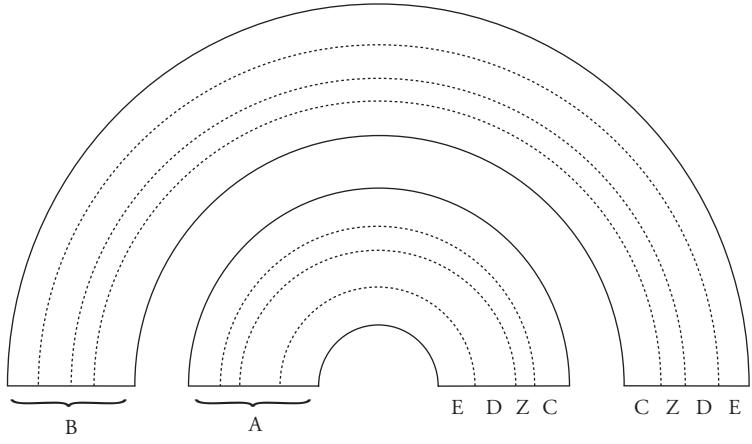

Fig. 5

3.5
The Geometry of Rainbows

Among the other circumstances surrounding the rainbow, it will be clear to those who consider the diagram, that it can occur neither as a circle nor any section larger than a semicircle.

For if there is a hemisphere on the horizon circle at A, and a center K, and some other point rising at H, and if the lines from K fall in the manner of a cone and produce, as it were, an axis [of the cone] on line HK, and the lines from K joined to M are reflected from the hemisphere to H over the greater angle, then the lines from K will fall upon the circumference of a circle [Fig. 6].

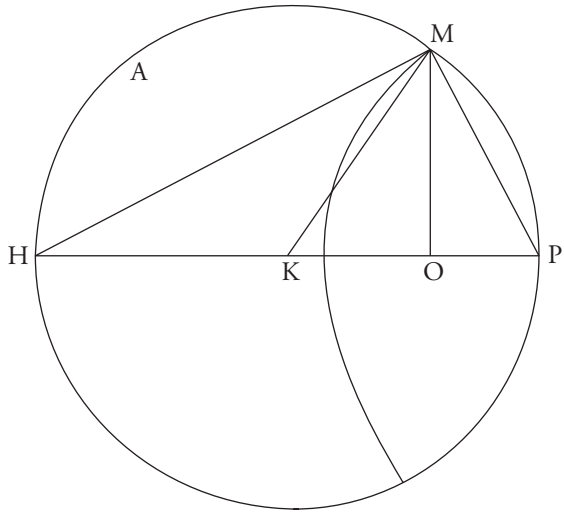

Fig. 6

And if the reflection occurs upon the rising or setting of the heavenly body, the part of the circle that occurs above the earth will be cut off by the horizon as a semicircle, but [if the reflection takes place] above that, it will be in every case less than a semicircle. And it will be smallest, whenever the heavenly body comes to be on the meridian.

First, let it be at the rising at H, and let the line KM be reflected to H, and let the plane on line A, the one from the triangle in which HKM is, be produced [Fig. 7]. Therefore, the section of the sphere will be a great circle. Let this be the circle at A; for it will make no difference which plane on HK is produced in accord with the triangle KMH.

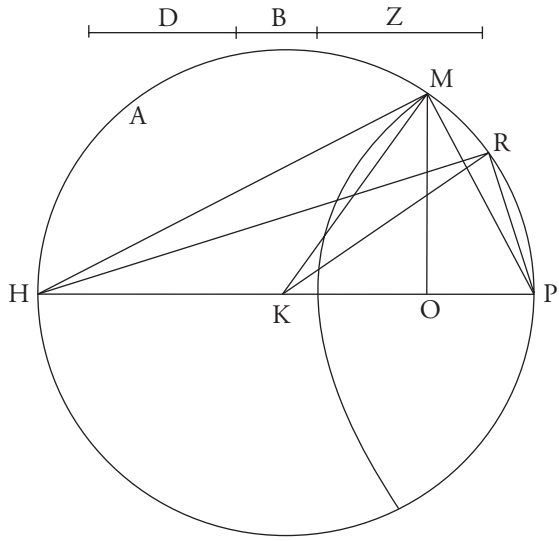

Fig. 7

{Therefore, the lines drawn from H and K will not meet together in this proportion at **376a1**
any arbitrary point of the semicircle A; for since the points K and H and the line HK are
given, the line MH would also be given, so that the proportion of the line MH to MK
also [would be given]. Since, then, the circumference is given, M will touch it. Let this
be [the line] upon which points N and M are located, with the result that the section of
the circumferences is given. [Lines having] the same proportion and being in the same
plane do not meet together from the same points at any other circumference than MN.

Let some line DB be set out, then, and let D be cut in proportion to B as MH is
to MK. MH is greater than KM, since the reflection is toward the greater angle of the
cone, since it subtends the greater angle of the triangle KMH. Therefore, the line D is
greater than the line B. So, let there be added to the line B the line Z, so that what D
is to B, BZ is to D. Then what the line Z is to KH, let the line B be made to another
line, line KP, and let the line MP be joined from P to M.

P will then be the pole of the circle on which the lines from K meet; for what the
line Z is to KH, the line B will be to KP, and the line D will be to PM. For let it not
be so, but rather [to a line] less or greater than PM (for it will make no difference). Let
it be in proportion to PR. Therefore, the lines HK and KP and the line PR will have
the same proportion to one another as the lines D, B, and Z. But the lines D, B, and
Z were in proportion: as the line D was to B, the line ZB was to D. So what PH is
to PR, the line PR is to PK. If, then, the lines HR and KR are joined from K and H
to R, these joined lines will have the same proportion that HP has to PR; for around
the same angle P the lines of the triangles HPR and KRP are proportional, so that the
line HR[106] will also have the same proportion to KR as the line HP to PR. And the

106. Reading HR.

line MH will have this proportion to KM; for they both have the same proportion as
376[b]1 D to B, so that not only do they meet the circumference MN in the same proportion from the points H and K, but also from elsewhere. But this is impossible. So, since the line D is proportional neither to a line smaller than MP nor to one bigger (for it will be proved in a similar manner), it is clear that it would be proportional to that at MP itself, so that what MP will be to PK, PH is to MP, and finally the line MH to MK.[107]

So, if a circle is drawn using the point P as a pole and the line MP as a distance, it will touch all the angles, which the lines from the circle MA make upon reflection. Otherwise, the lines meeting arbitrarily on the semicircle will similarly be shown to have the same proportion, which is precisely what was impossible.}[108]

If, then, one circumscribes the semicircle on A around the diameter HKP, the lines reflected from HK will be similarly related to M in all the planes, and will make the angle KMH equal. And the angle that the lines HP and MP make on HP will be equal in every case. So the triangles on HP and KP are equal to the triangles HMP and KMP. And their perpendiculars will fall upon the same point of HP and will be equal. Let them fall upon O. Therefore, O will be the center of the circle, and the semicircle around MN will be intercepted by the horizon.

{For [they claim] the sun does not master the upper area but masters the things that are aloft nearby and scatters the air. And that is why the rainbow does not create a circle. And it occurs at night as well from the moon, though rarely; for the moon is not always full and it is too weak in its nature to master the air, but the rainbow arises especially where the sun is especially mastered; for the greatest amount of mist remains in the rainbow.}[109]

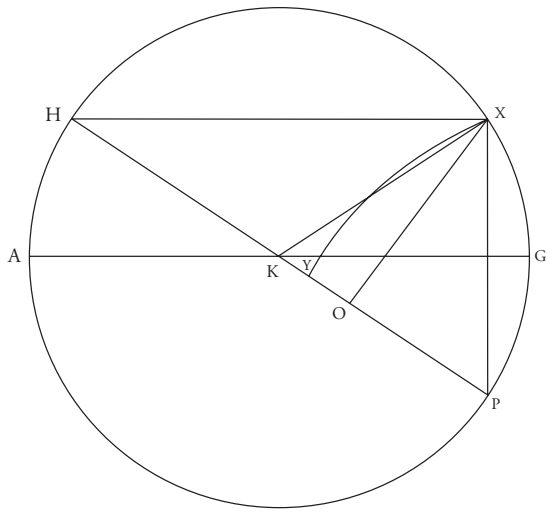

Fig. 8

107. Reading καὶ λοιπὴ ἡ τὸ ΜΗ πρὸς ΜΚ.
108. The bracketed passage (376[a]1–[b]12) is almost certainly an interpolation.
109. This paragraph is out of place and corrupt.

Again, let the horizon be at AKG, and let H already have risen, and let the axis be now at HP [Fig. 8]. Then all the other things will be proved as previously, but the pole of the circle at P will be below the horizon AG, since the point H is raised. The pole, the center of the [rainbow] circle, and the center of the circle now defining the rising point (for this is the circle HP) are on the same line. And since KH is above the diameter AG, the center [of the rainbow] would be below the horizon previously on the line AG, on the line KP at O.[110] So the section above, that at XY, will be smaller than a semicircle; for XYO was the semicircle, but now it is cut off by the horizon AG. The part OY of it, then, will be invisible, when the sun has risen up, and [the visible rainbow] will be smallest when [the sun] is at midday; for the higher H is, the lower will be the pole and the center of the circle.

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And on the shorter days after the fall equinox it is always possible for a rainbow to occur, but on the longer days from one equinox to the other, no rainbow occurs around midday. The cause of this is that all the sections [of the sun's orbit] toward the Bear are greater than a semicircle, and continually become greater than a semicircle [as the sun travels further north], and the invisible part is small; but as for the sections south of the equinox, the section above [the earth] is small, while the section below the earth is big, and the further away it is, the bigger it is, so that in the days around the summer solstice, due to the magnitude of the section, before the H line comes to the middle of the section and to midday, the P line comes to be already completely below, because the midday [sun] is far distant from the earth due to the magnitude of the section. But in the days around the winter solstice, because the sections of the circles are not much above the earth, it is necessary that the opposite occur. For the sun comes to be upon the meridian, when the line on H is raised but a little.

3.6
Parhelia and Rods; Metals and Minerals

One must suppose that the causes of parhelia and rods are the same as those we have discussed.

For the parhelion occurs when the ray of sight is reflected to the sun, while rods occur because the ray of sight that reaches [the sun] is of the sort that, as we said,[111] occurs whenever, the clouds being in the proximity of the sun, the ray of sight is reflected from something wet toward a cloud; for clouds themselves appear uncolored when you look straight at them, but in the water the cloud is full of rods, except that in the latter case the color of the cloud appears to be in the water, while with the rods, the color seems to be on the cloud itself. This comes to be so, whenever the composition of the cloud is irregular, here denser, there rare, and here more watery, there

377ᵇ1

110. Reading O.
111. 374ᵇ9–35.

less so. For when the ray of sight is reflected toward the sun, the shape is not seen, but the color is. And because the bright and white sun, toward which the ray of sight is reflected, appears on something irregular, part appears crimson and part appears green or yellow. For it makes no difference whether one sees the ray of sight through things of this sort or reflected from things of this sort; for either way it appears with the same color, so that if it is crimson one way, it is crimson the other too.

Thus, the rods, because of the irregularity in the mirror, occur not with shape but with color. But the parhelion occurs whenever the air is as regular as possible and evenly dense. That is why it appears white; for the regularity of the mirror produces the single color of its appearance. And the reflection of a concentrated ray of sight, because it reaches the sun altogether from a mist that is dense, that is, one that is not yet rain, but being close to rain, causes the color to appear which belongs to the sun, like the ray of sight that is bent from a smooth bronze surface because of its density. As a result, since the color of the sun is white, the parhelion too appears white. And, for this same reason, the parhelion is more a sign of rain than the rods are; for [in the former case] the air happens to be more favorable for the coming to be of rain. And a southern parhelion more than a northerly, because southern air changes more readily into rain than air toward the Bear.

Both rods and parhelia occur, as we said,[112] around sunset and around sunrise, and neither above nor below [the sun], but at the sides. And they do not occur very near the sun nor very far away either; for the sun dissolves the composition if it is close; and if it is far away, the ray of sight will not be reflected; for when it is stretched out over a long distance from a small mirror, it becomes weak. That is also why halos do not occur opposite the sun. If they occur above and close, the sun will dissolve [the composition]; and if it is far off, the ray of sight will be too small to produce a reflection and will not reach [the sun]. But at the side, the mirror is sufficiently distant that the sun does not dissolve the composition, and the ray of sight arrives [at the sun] in a concentrated mass, because as it travels along the earth, it is not pulled apart, as it would be, if it were spatially moving through open space. But it does not occur below the sun because, near the earth, it would be dissolved by the sun, and if the composition came to be above in mid-heaven, the ray of sight would be pulled apart. Nor does it appear in mid-heaven at all, not even at the sides of the sun; for the ray of sight is not being carried near the earth, so that little reaches the mirror, and the reflected ray becomes altogether weak.

These are pretty much the number and sorts of effects that this segregation presents in the places above the earth. As for the effects that are produced in the earth itself, when [the segregation] is locked up by parts of the earth, these we must discuss.

For [the earth] itself produces two different sorts of bodies because it too has a twofold nature, just as in the area above the earth; for the exhalations are two,

112. 372a10–13.

the vaporous and the smoky, as we claim.[113] And the forms of those things that occur in the earth are twofold as well, the minerals and the metals. When it burns, the dry exhalation is the one that produces all the minerals, like the unmeltable kinds of stones, realgar, ochre, ruddle, sulfur, and the like. The majority of minerals are colored dust, but some are stone from a composition of this sort—for example, cinnabar.

From the vaporous exhalation [originate] all things that are mined, and these are either poured or chased, like iron, gold, and copper. The vaporous exhalation produces all these when it is locked up, and especially in stones, being squeezed together into one and solidified due to the dryness, like dew or frost, whenever it is separated out. But here these things are produced, before they have been separated out. That is why these things are in a way like water, but in a way they are not; for their matter was potentially that of water, but it is no longer, nor do they, like flavors, come to be from water due to some affection. For neither copper nor gold comes to be in this way, but before they become [water], each of them results from the solidification of the exhalation. That is also why they all burn and contain earth; for they contain dry exhalation. Gold alone does not burn. **$378^{b}1$**

We have now spoken about all these things at a general level, and must investigate each one in particular, taking up each kind.

BOOK 4[114]

4.1
Hot, Cold, Wet, and Dry; Putrefaction

Four causes have been distinguished for the elements, and in virtue of the combinations of these, it results that the elements are also four, of which two are capable of affecting, the hot and the cold, and two of being affectable, the dry and the wet. Conviction on these matters is based on induction; for in every case we see hotness and coldness determining, naturally unifying, and changing both things of the same kind and things not of the same kind, and wetting, drying, hardening, and softening them. Things dry and wet, by contrast, both intrinsically and when jointly present in bodies composed of both, are determined, and are affected, by the other affections just mentioned.

113. $341^{b}5$–10.

114. Alexander of Aphrodisias, in his commentary on the *Meteorology*, writes: "The book entitled 'the fourth' of Aristotle's *Meteorology* does belong to Aristotle, but not to the study concerning meteorology. For the things spoken about in it are not proper to meteorology. Rather, as far as the things spoken about are concerned, it would follow *On Coming to Be and Passing Away*" (179.3–6). It is often, with justification, referred to as Aristotle's treatise on chemistry.

Further, it is clear from the accounts by which we define the natures of these; for we speak of the hot and cold as capable of affecting (for the capacity to aggregate is a sort of capacity to affect), but the wet and dry as affectable (for things are said to be easily bounded, and difficult [for other things] to bound, in virtue of their nature being affected in a certain way). [Since all this is so,] it is evident that some things are capable of affecting, others affectable. Having determined these things, we must grasp the workings of these, the workings of the ones capable of affecting, and the forms of the affectable ones.

In the first place, then, universally [speaking], unconditional coming to be and natural change is the work of these capacities, as is the opposite passing away that is in accord with nature. And these occur both in plants and in animals and their parts. Unconditional and natural coming to be is a change due to these capacities (when they stand in the right ratio) in the matter that underlies each nature—this being the affectable capacities we have just mentioned. And the hot and the cold produce [their **379^{a}1** effects] by mastering the matter. But when they fail to master it, partial parboiling, that is, unconcoction, occurs.

But the most common contrary to unconditional coming to be is putrefaction; for all passing away that is in accord with nature is *en route* to it—for example, old age and drying up. Putrescence is the end of all these things, that is, of the ones composed by nature, unless something passes away by force; for it is indeed possible to burn flesh, bone, and whatever, but the end of their passing away in accord with nature is putrefaction. That is why putrefying things become first wet and then, in the end, dry; for they came to be from these, the wet being determined by the dry through the workings of things capable of affecting.

Passing away comes about when what is being determined masters what is determining it because of the environment (although in a special sense putrefying is said of things that partially pass away, when they have been separated from their nature). That is why, indeed, all the others except fire putrefy; for earth, water, and air indeed putrefy; for all these are matter for fire.

Putrefaction is the passing away of the proper and natural heat within a given wet thing caused by an alien heat, that is, the heat from its environment. So, since a thing is affected in this way because of a deficiency of heat, and since everything deficient in this sort of capacity is cold, both would be a cause, and putrefaction would be the common affection of proper coldness and alien heat. For this is also why everything that putrefies becomes dry and, in the end, earth or dung; for as its proper heat leaves it, its natural liquid vaporates with it, and there is nothing to suck in liquid; for its proper heat is what attracts it and draws it in.

Also, a thing putrefies less in cold spells than in warm ones; for in winter the environmental air and water contain little heat, so that it has no strength, while in the summer they have more. Also, what is frozen does not putrefy (for its cold is greater than the air's heat, and hence is not mastered by it, while the mover does master), nor does what is boiling or hot putrefy (for the heat in the air is less than in the

thing, so that it does not master it or produce any change whatever). Similarly too, anything that is moving or flowing putrefies less easily than what is immobile; for the movement due to the heat in the air is weaker than the one preexisting in the thing, so that it does not make it change at all. **379^{b}1**

And due to the same cause, a large quantity putrefies less easily than a small one; for in the larger quantity there is too much proper fire and cold for the capacities in what surrounds it to master it. That is why the sea putrefies quickly when segregated out into parts, but when all together it does not, and all other waters likewise. Also, living things come to be in putrefying things, because the heat being segregated out from them, being natural, causes the composition of the things segregated out.

What coming to be is, then, and passing away, has been stated.

4.2
Concoction and Unconcoction

It remains to state the subsequent forms, the ones that the capacities that were mentioned produce by their workings from things that are already composed by nature as underlying subjects.

Of heat, then, this is concoction (*pepsis*), and of concoction [the forms are] ripening (*pepansis*), boiling (*hepsêsis*), and further, broiling (*optêsis*). Of cold, on the other hand, it is unconcoction (*apepsia*), and of it [the forms are] rawness (*ômotês*), parboiling (*molunsis*), and par-broiling (*stateusis*). We must take it, however, that these names are not said strictly of the things. On the contrary, there are no names established universally for similar things. So we must consider the forms just mentioned as not the same as these things but as of the same sort. However, let us say of each of them what it is.

Concoction, then, is a completion due to the natural and proper heat and is [produced] from the opposing affectables, these being the matter proper to the given thing. For when it has been concocted, it is completed and has come to be. And the starting-point of the completion comes about due to the proper heat, even if certain of the external aids contributed to its accomplishment—for example, nourishment is helped in its concoctions even by baths and by other things of this sort. But the starting-point, at any rate, is the heat within the body itself. And the end in some cases is the nature—but nature, we say, as form and substance. In others the end of concoction lies in a certain underlying shape [or form], as when the wet has come to be of such-and-such quality, or of such-and-such quantity, when broiled or boiled or putrefied, or heated in some other way; for at that time it is useful and we say it has been concocted, like wine must, what gets composed in boils, when pus arises, and tears when they become rheum, and likewise in other cases.

Concoction, in fact, is what everything is affected by when its matter—that is, its liquid—is mastered; for this is what is determined by the heat in its nature. For as

long as the ratio is present in the latter, it is this that constitutes its nature. So things of this sort are signs of health, urine and stool and residues in general. And we say that they have been concocted, because they make clear that the proper heat is mastering the indefinite [matter]. And it is necessary for concocted things to be denser and hotter; for the sort of thing heat accomplishes is to make things more compact, denser, and drier.

This, then, is what concoction is, while unconcoction is non-completion due to a deficiency of proper heat (and deficiency of heat is coldness). And the non-completion is of the opposed affectables, which is for each thing the natural matter.

Let concoction and unconcoction, then, be defined in this way.

4.3
The Various Sorts of Concoction

Ripening is a sort of concoction; for the concoction of the nourishment in fruit is said to be ripening. And since concoction is a completion, ripening is complete when the seeds in the fruit are capable of producing another of the same sort as the fruit itself; for this is also what we mean by "complete" in other cases. In the case of fruit, then, this is ripening, but many other things that have been concocted are said to be ripe, with reference to the same form [of ripeness], but by transference, because, as was said previously,[115] no names have been established for each particular sort of completion having to do with the determinations [of the matter] due to natural heat and cold. In the case of boils, phlegm, and things of this sort, ripening is the concoction of the liquid within them by their natural heat; for it is impossible for what does not master something to determine it. Everything that ripens, then, if it comes from breathy things, is watery; and from things of the latter sort earthen ones are composed; and always from fine-grained things more coarse-grained ones come to be. And in accord with this the nature draws some of these into itself,[116] while others it rejects.

It has been stated, then, what ripening is. Rawness is its contrary; for its contrary is unconcoction of the nourishment in the fruit; and this is the indefinite liquid. That is why rawness is either breathy, watery, or both. And since ripening is a sort of completion, rawness will be an incompletion. Incompletion comes about because of a deficiency of natural heat and a lack of proportion in relation to the liquid that is being ripened. (But nothing wet ripens intrinsically without something dry; for water alone of the liquids does not become coarse-grained.) This lack of proportion results either due to the quantity of the hot being small or because the quantity being determined is large. That is also why the humors of raw things are fine-grained, and cold rather than hot, and they are inedible and undrinkable.

115. 379ᵇ14–18.
116. Reading ἑαυτὴν.

But rawness, in fact, just like ripening too, is said of things in many ways. Thus urine, excreta, and catarrhs are all said to be raw due to the same cause; for raw things are all so called due to the [matter] not having been mastered or composed by the heat. And if we go further, potter's clay is said to be raw and milk and many other things are said to be raw too, if they are capable of changing and being composed by the heat but have remained unaffected. That is why water is said to be boiled, but not raw, because it does not become coarse-grained.

It has now been stated what ripening is, and rawness, and what causes each of them is due to.

Boiling in general is concoction by wet heat of the indefinite [matter] present in the liquid [in the thing being boiled], but the name is said in the strict sense only of things being cooked by boiling. This, as was stated,[117] is either breathy or watery. The concoction comes about due to the fire in the liquid; for what is cooked on griddles is broiled; for it is affected by the external heat and, as for the liquid [that is, the fat] in which it is contained, it dries this up, taking it into itself. But what is boiled produces the contrary effect; for its liquid is segregated out of it due to the heat in the liquid outside it. That is why boiled things are drier than broiled ones; for boiled things do not draw liquid into themselves; the external heat masters the internal; while if a thing's internal heat did master, it would draw liquid into itself.

Not every body can be boiled; for neither can something—for example, stones—in which there is no liquid [to be boiled], nor can things in which there is liquid, but which are too dense for it to be mastered—for example, wood. But those bodies that contain liquid that is affectable by the fire burning in the liquid [outside them] can be boiled. Again, gold, wood, and many other things are said to be boiled, with reference not to this same form, but by transference; for no names have been established for the differences. We also speak of liquids such as milk and grape must as being boiled when the humor in the liquid changes to a certain form due to the heat of the external fire that surrounds them, so that it produces an effect much the same as the boiling just mentioned.

But the end is not the same in the case of all these things, either boiled or concocted. In some, it is with a view to eating, in others, with a view to drinking, in **381^{a}1** others, with a view to some other use, since we speak of drugs too as being boiled.

So all things can be boiled that are capable of becoming more coarse-grained, smaller, heavier; as can those of which some parts are of these sorts, while other parts are of the contrary sorts, because when these things disaggregate some parts become coarse-grained and other parts fine-grained (as milk disaggregates into whey and curd). Olive oil by itself, on the other hand, does not boil, because it is affected in none of these ways.

This, then, is what concoction by boiling is said to be. And it makes no difference whether it occurs in craft-produced instruments or in natural ones, because the cause will be the same in all cases.

117. 380^{a}23–25.

Parboiling is the [sort of] unconcoction that is contrary to boiling. And so the contrary of boiling, and what is called "parboiling" in the primary sense, would be unconcoction of the indefinite [matter] in the body due to a deficiency of heat in the surrounding liquid (that deficiency of heat is presence of cold has already been stated[118]). This comes about because of another sort of movement; for the heat doing the concocting is expelled, and the deficiency of heat is due either to the quantity of cold in the liquid or due to the quantity of it in the thing being boiled; for then the result is that the heat in the liquid is too great to cause no movement at all, but too small to make it even and concoct throughout. That is why things are harder when they are parboiled than when they are boiled, and the wet parts more distinguished.

It has now been stated what boiling is, and what parboiling is, and what cause each is due to.

Broiling is concoction by dry and alien heat. That is why even if someone were to produce a change and a concoction by boiling, but not due to the heat of the liquid but rather that of the fire, when the process is complete, the thing is broiled, not boiled, and if excessively it is said to be burned. And it is due to dry heat when the thing ends up becoming drier. That is also why the outside is drier than the inside, while with boiled things it is the contrary. Also, when the work is artificial, broiling is more difficult than boiling; for it is difficult to heat the outside and the inside evenly. For the parts nearer the fire dry faster and so dry more as well. When, then, the outer ducts contract, the liquid contained in the thing cannot get segregated out, but is trapped inside when the ducts shut.

Broiling and boiling are, of course, due to craft, but, as we said,[119] the same universal forms are also due to nature; for the affections that come about are similar, although they are nameless; for craft imitates nature, since in fact the concoction of nourishment in the body is similar to boiling; for it too comes about in something wet and hot due to the heat in the body. And unconcoction is sometimes like parboiling. Also, it is not in the process of concoction that living things come to be, as some people say,[120] but rather they come to be in the excreta that putrefy in the lower intestines, and then ascend; for concoction takes place in the upper intestines, while the excreta decay in the lower ones. The cause of this has been spoken about elsewhere.[121]

Parboiling, then, is contrary to boiling. And to the concoction we have called "broiling," there is a similarly opposed one, but it is harder to find a name for it. It is the sort of thing that would happen if there were par-broiling but not broiling [proper] because of a deficiency of heat that would take place either because of too little external fire or because of the quantity of water in the thing being broiled; for then the heat is too great to cause no movement at all, but too small to concoct [properly].

What concoction is and unconcoction, ripeness and rawness, boiling and broiling and their contraries, has now been stated.

118. 380[a]8.
119. 379[b]14–17, 380[a]16–18.
120. It is not clear to whom Aristotle is referring—perhaps some Hippocratics.
121. The reference is unclear.

4.4
Wet and Dry

We must now speak about the forms of the affectables, the wet and the dry.

The starting-points of the [elementary] bodies, the affectable starting-points, are wet and dry, and the others are mixtures composed of these, and whichever of them there is more of, of it the nature of the thing is more—for example, some are more dry, others more wet. All of them will, on the one hand, be actual, and, on the other, the opposite—for example, this is how melting stands in relation to meltable.

But since the wet is easily bounded, while the dry is difficult to bound, they are affected by each other somewhat as a gourmet dish is by its seasonings; for the wet is a cause of the dry's being bounded, and each becomes a sort of glue to the other—just as Empedocles puts it in *On Nature*, "gluing meal together with water."[122] And because of this the definite body is composed of both. And of the elements earth **382[a]1** is said to have the most special affections of dry, water of wet. That is why all the definite bodies here are not without earth and water (and whichever it is more of, this capacity is the one each appears to be in accord with), and it is only in earth and in water that there are animals, and not in air or fire, because the former ones are the matter for their bodies.

Among the affections of bodies, the primary ones that of necessity belong to a definite thing are hardness and softness; for it is necessary for what is composed of the wet and dry to be either hard or soft. Hard is that whose surface cannot be pressed into itself; soft is that whose surface can be pressed in, but not by being replaced; for water is not soft; for its surface is not pressed downward by pressure, but is replaced. Something is unconditionally hard or unconditionally soft if it is unconditionally like that, while it is so in relation to something else if it is like that in relation to it. In relation to each other they are undetermined by more or less, but since we discern all perceptibles in relation to perception, it is clear that we determine both the hard and the soft in relation to touch, because it is as a mean that we use touch. That is why we say that what exceeds it is hard and what is deficient is soft.

4.5
Bodies and Solidification

It is necessary for a body that is determined by its own proper defining marks to be hard or soft; for either it can be pressed, or it cannot. Further, it must be solidified; for it is determined by this. So since everything determined and composed is either soft or hard, and softness and hardness are due to solidification, no composed and definite thing could exist without solidification. Solidification, then, must be spoken about.

122. B34 DK.

There are, then, two causes that have to do with[123] the matter, the affecter and the affection—the affecter as where the movement starts from, the affection as form. So solidification and diffusion, drying and wetting, also [involve these]. And the affecter affects due to two capacities and the thing is affected due to two affections, as has been stated.[124] It affects due to heat and cold, and the affection is due either to the absence or presence of heat or cold.

382b1 But since solidification is a sort of drying, we must speak about drying first. What is affected, then, is either wet or dry or composed of both. And we suppose that water is the body of what is wet, and earth of what is dry; for of things that are wet and dry these are the affectable ones. That is also why the cold is more characteristic of the affectable ones; for it is present in them; for in fact we take both earth and water to be cold. And the cold is capable of affecting [only] as destructive or coincidentally, as was said previously;[125] for sometimes the cold is said to burn and heat, not in the way the hot does, but by bringing together and compressing the hot.

Whatever is water, or is a form of water, or contains water, whether brought in or innate can become dry (by "brought in" I mean like the water in wool, by "innate" like the water in milk). Forms of water are things such as the following: wine, urine, whey, and, in general, whatever contains—not due to viscosity—no, or very little, sediment; for sometimes the cause of having no sediment is viscosity, as with olive oil and pitch. All things become dry due either to heating or cooling, but in both cases it is by heat, whether internal heat or external heat; for even things that are dried by cooling, like a cloak, in which the liquid is intrinsically separated, are dried by their internal heat, which makes the liquid evaporate together with it, when, if their wet content is small, the liquid comes out together with the heat as evaporation, due to the surrounding cold.

All things become dry, then, as was said,[126] either by being heated or cooled, and always because of heat, whether internal or external, evaporating the liquid together with it (by "external" I mean, for example, when things are boiled; "internal," when the heat exhales, subtracts, and consumes [the liquid]).

Drying has now been spoken about.

4.6
The Various Sorts of Solidification

Liquefaction is in one case water coming to be by composition, in the other the melting of a solid. Of these, composition occurs when the breath is cooled, while melting will be clear at the same time as solidification.

123. Reading περὶ.
124. 378b12–13.
125. 347b2–7.
126. 382b16–18.

Things that solidify solidify because they are either watery or a mixture of earth and water, and do so due to either dry heat or cold. That is also why all bodies solidified by heat or cold, when they dissolve, dissolve due to their contraries; for those **383^{a}1**
that solidify due to dry heat dissolve due to water, which is wet cold, while bodies that solidify due to cold dissolve due to fire, which is hot. Some things, though, would seem to solidify due to water—for example, boiled honey. But it does not solidify due to the water, but due to the cold within it. 5

Watery things do not solidify due to fire. For they dissolve due to fire, and the same thing in relation to the same thing will not be the cause of the contrary effect in the same thing. Further, it is by the exiting of heat that they are solidified, so it is clear that it is by its entering that they will be dissolved. So it is solidified due to the cold as affecter. That is also why when watery things solidify they do not become 10
coarse-grained; for coarse-grainedness comes about because of the exiting of water, and of the composing of the dry. And water alone of the liquids does not become coarse-grained.

Compounds of earth and water are solidified both by fire and by cold, and become coarse-grained due to both, in some respects in the same way, in others in 15
distinct ways, due to heat drawing out the liquid (for when the liquid evaporates, the dry becomes coarse-grained and composed), or due to cold squeezing out the heat along with which the vaporizing liquid also departs. Things, then, that are soft but not liquid do not become coarse-grained, but rather solidify when water exits them—for example, clay when baked. But mixtures that are liquids become coarse- 20
grained as well—for example, milk. And those that were previously coarse-grained and hard due to the cold often become wet at first, as again clay on first being baked gives off steam and becomes softer (which is why indeed it [sometimes] gets distorted in the kilns). 25

Of the things solidified due to the cold that are compounds of earth and water, but contain more earth, those that solidify because of the exiting of heat melt when the heat enters them again—for example, mud when it has frozen. But those that solidify due to cooling, and because of the evaporation of all their heat at the same time, are indissoluble except by excessive heat, although they can be softened—for 30
example, iron and horn. Wrought iron will indeed melt, so that it becomes liquid and then solidifies again. Steel too is produced in this way; for the dross sinks down to the bottom and is cleared away below. And when it has been affected often in this way and becomes pure, steel results, but they do not do this often because the clearing **383^{b}1**
away involves much waste and loss of weight. But the less the waste, the better the iron. Pyrimachus stone also melts, so that it forms drops and becomes molten, and 5
when it solidifies after it has run, it becomes hard again; and millstones melt, so that they become molten, and when they solidify again, though they are black in color, they become like lime [in consistency].[127] Mud and earth both melt as well.

127. Apparently a sort of silex (especially quartz or flint).

Among things solidified by dry heat, some are non-dissolvable, others dissolvable by a liquid. Pottery and some kinds of stone that are made of earth calcined by fire, such as millstones, are non-dissolvable. But soda and salt are dissolvable in liquid, not in all liquid though, but [only] in cold. That is why they melt in water and in things watery in form, but not in olive oil. For wet cold is contrary to dry heat. If one solidifies, then, the other will dissolve; for in this way contraries will be causes of contraries.

4.7
Coarse-Grainedness Caused by Heat and Caused by Cold

Things that are composed more of water than of earth only become coarse-grained due to fire, while those that are composed more of earth become solidified. That is why soda and salt are composed more of earth, as are stone and clay.

The nature of olive oil, however, is most puzzling. For if it is composed [more] of water, it should be solidified due to cold, but if more of earth, due to fire. But as things stand, it is solidified due to neither, but becomes coarse-grained due to both. The cause is that it is full of air. That is also why it rises to the surface of water; in fact air travels upward too. Cold makes it coarse-grained by producing water from the breath within it. For always, when water and olive oil are mixed, the two together become more coarse-grained. And due to fire and time olive oil becomes coarse-grained and whitens. It whitens due to the evaporation of any water there was within it, while it becomes coarse-grained because, as its heat dies out, water comes to be from the air. In both ways, then, the same affection comes about, and due to the same thing, but not in the same way. It certainly becomes coarse-grained due to both [heat and cold], but it does not become dry due to either (for neither the sun nor cold dry it), not only because it is viscous, but also because it is composed of air. But the water
384ᵃ1 does not get dried out or boiled off due to the fire, because, due to the viscosity, it does not evaporate.

Things that are mixtures of water and earth are fittingly said [to be what they are] in accord with the quantity of each; for a sort of wine becomes both solid and coarse-grained when it is boiled—for example, wine must. In the case of all things of this sort, it is the water that departs when they are drying. A sign that it is the water is that the vapor gets composed into water, if one wishes to collect it. So in those in which something remains, that something is composed of earth. Some of these things, as was said,[128] also become coarse-grained and dried due to cold; for cold not only solidifies, but also dries water, and makes things coarse-grained by making air into water. And solidification, as was said,[129] is a sort of drying.

128. 383ᵃ13–14.
129. 382ᵇ1.

Things, then, that do not become coarse-grained due to cold, but solidified, are composed more of water—for example, wine, urine, vinegar, lye, and whey. But things that become coarse-grained [due to cold] (not by evaporation due to fire) are either composed [more] of earth or are compounds of water and air—for example, honey [more] of earth, olive oil [more] of air. And milk and blood are compounds of both earth and water, but more so of earth in most cases, as too are the liquids from which soda and salt come to be (and stones are also composed of certain ones of this sort). That is why whey, if it has not been separated out, burns off when it is boiled by fire.

Regarding what is earthen [in milk], it also becomes composed due to fig juice, if one boils it in the way doctors do when they curdle it. This is the way the whey and the cheese are separated. But when whey is separated, it no longer becomes coarse-grained but boils off like water. And if milk contains little or no cheese, it is composed more of water and is without nourishment. And blood is similar; for it solidifies when dried by cooling. But the sorts of blood that do not solidify, like that of the deer, are composed more of water, and are cold. Hence, they do not contain fibers; for fibers are composed of earth and are solid. So, when they are removed, the blood does not solidify. This is because it does not become dry; for what remains is water, as with milk when the cheese has been removed. A sign of this is that diseased blood tends not to solidify; for it is serous, [that is,] it is phlegm and water, because of being incapable of being concocted and mastered by the nature.

Further, some of these [compounds of water and earth] are dissolvable—for example, soda; others are indissoluble—for example, pottery. And of these latter, some can be softened—for example, horn; others cannot be softened—for example, pottery and stone. The cause of this is that contraries are a cause of contraries, so that if solidification is due to two, cold and dry, it is necessary for dissolution to be due to hot and wet. That is why dissolution is due to fire and water (for these are contraries): to water, of what is solidified by fire alone, and to fire, of what is solidified by cold alone. So if any things happen to be solidified by both, these are most indissoluble of all. And things become of this sort when, after having been heated, they are solidified by the cold; for the result is that when the exiting heat has evaporated most of their liquid, they are squeezed together again by the cold, so that they provide no entry route even for liquid. And, because of this, neither heat dissolves them (for it dissolves only things solidified by cold) nor water (for it does not dissolve things solidified by cold but only things solidified by dry heat). But iron is melted by heat and solidifies when cooled.

$384^{b}1$

Woods are composed of earth and air. That is why they are combustible, not meltable or softenable, and float on water—except for ebony, which does not; for while the other woods contain much air, in black ebony the air has evaporated out and there is more earth in it.

Potter's clay is composed of earth alone because, while drying, it solidifies by small degrees; for water has no ways in even where breath alone had escaped just by itself, nor has fire; for it solidified the clay.

What solidification is, and melting, and the number of causes they are due to and of things in which they occur, have now been stated.

4.8
The Capacities and Incapacities of Uniform Bodies (1)

From the preceding it is evident that bodies are composed by heat and cold, and are made coarse-grained and solid by the workings of these. And because of being crafted by these, there is heat in all of them, while in some there is also cold, insofar as heat is wanting. So, since these belong [to bodies] due to being capable of affecting, wet and dry due to being capable of being affected, compound bodies have a share of all of them.

The uniform bodies, then, are composed of water and earth, both in plants and in animals, and metals, such as gold, silver, and others of this sort are composed of them and from their exhalation when it is enclosed [under the earth], as has been stated elsewhere.[130]

All these things differ from each other with regard to the special objects of the perceptual modalities, in virtue of their being capable of affecting [the capacities] in a certain way (for a thing is white, fragrant, resonant, sweet, hot, or cold, in virtue of being capable of affecting the perceptual modality in a certain way), and also with regard to other affections more proper to themselves, which are called what they are in virtue of being affectable—I mean, for example, being dissolvable, solidifiable, bendable, and whatever others are of this sort; for all things of this sort are affectables, like wet and dry. It is in virtue of these that bone, flesh, sinew, wood, bark, stone, and each of the other uniform natural bodies differ.

Let us state first the number of these, the ones that are said of things as capacities and as incapacities. They are as follows:

solidifiable (*pêkton*)	non-solidifiable
meltable (*têkton*)	non-meltable
softenable by heat (*malakton*)	non-softenable by heat
drenchable (*tegkton*)	non-drenchable
bendable (*kampton*)	non-bendable
breakable (*katakton*)	non-breakable
shatterable (*thrauston*)	non-shatterable
receptive of impressions (*thlaston*)	non-receptive of impressions
plastic (*plaston*)	non-plastic
compressible (*pieston*)	non-compressible
pullable (*helkton*)	non-pullable

130. 378[a]18–31.

malleable (*elaton*)	non-malleable
splittable (*schiston*)	non-splittable
cuttable (*tmêton*)	non-cuttable
viscous (*glischron*)	crumbly (*psathuron*)
kneadable (*pilêton*)	non-kneadable
combustible (*kauston*)	non-combustible
capable of giving off fumes (*thumiaton*)	incapable of giving off fumes

The majority of bodies, pretty much, differ in virtue of these affections. What sort of capacity each of them has, let us now state.

About solidifiable and non-solidifiable, meltable and non-meltable, we have spoken in universal terms previously,[131] but let us return to them again now. Among bodies that solidify and harden, some are affected in this way due to heat, others due to cold—the one lot due to heat drying liquid, the other lot due to cold squeezing out heat. So one lot is thus affected in virtue of absence of liquid, the other lot in virtue of absence of heat, the watery ones in virtue of absence of heat, the earthen ones in virtue of absence of liquid. The ones affected in this way in virtue of absence of liquid are melted by liquid, unless they are composed in such a way that their ducts are rendered too small for the masses of the water to enter—for example, pottery. Those that are not composed this way are all melted by liquid—for example, soda, salt, and earth out of mud. On the other hand, those solidified by privation of heat are melted by heat—for example, ice, lead, and bronze.

The sorts of bodies, then, that are solidifiable and meltable, and the sorts that are non-meltable, have now been stated.

The non-solidifiable ones are the ones that do not contain watery liquid nor are watery, and are composed of more heat and earth—for example, honey and wine must (for they are as if fermenting); also those in which, though they contain water, there is more air—for example, olive oil, quicksilver, and any that are viscous, such as pitch and birdlime. **385^{b}1**

4.9
The Capacities and Incapacities of Uniform Bodies (2)

Bodies softenable by heat are those solid ones that are not composed of water (as ice is composed of water), but are more earthen, and whose water is neither all evaporated (as in soda or salt) nor possessed irregularly (as in pottery), but are pullable (without admitting water) or malleable (without consisting of water), and softenable by fire—for example, iron, horn, and woods.

131. 4.6–7.

Among bodies that are meltable and of those that are non-meltable, some are drenchable, others non-drenchable—for example, bronze, which is non-drenchable, is meltable, while wool and earth are drenchable; for they become wet through. And bronze, though it is meltable, is not meltable due to water. But some things too, though meltable due to water, are non-drenchable—for example, soda and salt; for nothing is drenchable either that does not become softer when soaked through. Some things, on the other hand, that are drenchable are not meltable—for example, wool and grains. And the drenchable ones are the ones that are earthen and have ducts larger than the masses of water, though they are harder than the [masses of] water.[132] And bodies that have ducts throughout are meltable by water. Why is it, though, that earth is both melted and drenched due to water, while soda is melted but not drenched? Because in soda the ducts are throughout, so that its parts are divided immediately by the water, while in earth, though there are also ducts, they lie so as not to meet, so that the affection differs, depending on which of the two ways it enters.

Some bodies are bendable or straightenable (for example, reed and withy), while other bodies are not (for example, stone and pottery). The ones that are non-bendable and non-straightenable are those bodies whose length is incapable of being changed from being bent to being straight and from being straight to being bent, and bending and straightening consist in the change or movement to being straight or to being curved; for whether a thing is being bent convexly or bent concavely it is being bent. Bending, then, is movement to the convex or to the concave, a thing's length being preserved; for if we were to add "to the straight," a thing would be simultaneously bent and straight—which is precisely what is impossible, for the straight to be bent. And if everything that is bent is either bent convexly or bent concavely, and of these the one is a change to the convex, the other to the concave, there would again not be a bending to the straight, but bending and straightening would be different things. These, then, are the bendable and straightenable things, and the non-bendable and non-straightenable ones.

Some things are both breakable and shatterable, either both at once or separately—for example, wood is breakable but not shatterable, ice and stone are shatterable but not breakable, while pottery is both shatterable and breakable. The difference is that breaking is division and separation into large parts, shattering into parts of random size and into more than two. Things, then, that solidify so that they have many ducts lying so as not to meet, are shatterable (for up to this number they can be divided), and things with ones that stretch a long way, are breakable, while things that have ducts of both sorts are both.

Some things are receptive of impressions, like bronze and wax, while others are non-receptive of impressions, like pottery and water. An impression is a shifting downward of part of a thing's surface by a pushing or a blow, or, in general, by

132. Reading ὄντας δὲ σκληροτέρους.

contact. And such things are either soft,[133] like wax, part of whose surface is shifted while the rest remains the same, or hard, like bronze. Things that are non-receptive of impressions are either hard, like pottery (for its surface cannot be pressed in downward), or wet, like water (for water can be pressed in, but not by a part's being so, but by replacement).

Among things receptive of impressions, the ones that retain the impression and are easily impressible by hand are plastic, while those not easily impressible, like stone or wood, or that, though easily impressible, do not retain the impression, like wool or sponge, are non-plastic, but are compressible.

Compressible things are ones that are capable of contracting into themselves on being pushed, their surface deviating downward without dividing and without one part changing places with another, as happens with water; for it does involve exchange of places. Pushing is a movement due to the mover which comes about due to [continuous] contact. A blow is when [the movement is] from a spatial movement. And things are compressible that have ducts empty of body of the same kind as **386^{b}1** themselves, and are capable—under compression—of compacting into the empty places within them, or rather into their own ducts; for sometimes the ones they contract into are not empty—for example, in a wet sponge (for its ducts are full).[134] But then what the ducts are full of is softer than the thing itself that is naturally such as to compact into itself. Compressible things, then, are ones like sponge, wax, and flesh. Non-compressible ones are ones that are not naturally such as to contract under compression into their own ducts, either because they do not have any or because they have ones filled with things that are harder; for iron is non-compressible, as are stone, water, and every liquid.

Pullable things are ones whose surface is capable of shifting on the sides, since for a thing to be pulled is for its surface to be shifted, while being continuous, in the direction of the mover. And some things are pullable (for example, hair, a leather thong, sinew, dough, and birdlime), others non-pullable (for example, water and stone). Some things indeed are themselves pullable and compressible (for example, wool), others not (for example, phlegm, which is non-compressible but pullable, or sponge, which is compressible but not pullable).

Some things are malleable too (for example, bronze), others non-malleable (for example, stone and wood). The malleable ones are the ones part of whose surface is capable of simultaneously shifting both sideways and downward due to the same blow; things incapable of this are non-malleable. All malleable things are receptive of impressions, but not all things receptive of impressions are malleable (for example, wood). But, generally speaking, the two convert. And of things that are compressible, some are malleable, others not (wax and mud are malleable, wool not).

133. Reading μαλακά.

134. Reading ἐνίοτε γὰρ οὐ κενοί εἰσιν εἰς οὓς συνέρχεται.

Some things are splittable (for example, wood), others non-splittable (for example, pottery). To be splittable is to be capable of being divided beyond the point to which the divider divides; for a thing is split when it divides beyond the point to which the divider divides and in advance of the process of division, while in cutting this is not so. Non-splittable things are the ones that are not capable of being affected in this way. Nothing soft is splittable either (I mean unconditionally soft, not soft in relation to one another; for in the latter way even iron will be soft), nor are all hard things, but only those that are neither liquid, nor receptive of impressions, nor shatterable. And things of this sort are those in which the ducts along which they cohere run lengthwise and not breadthwise.

Cuttable things are hard or soft compositions that are capable, when being divided, of not necessarily splitting in advance of the process of division nor of shattering. And the ones that are not wet are non-cuttable. Some things are both cuttable and splittable—for example, wood. But for the most part things are splittable lengthwise and cuttable breadthwise; for since each is divided into many parts, insofar as the unit is composed of many parts running lengthwise, it is splittable, and insofar as its unity is composed of many parts running breadthwise, it is cuttable.

A thing is viscous when, being wet or soft, it is pullable. And those among bodies which, because of the linking of their parts, are composed like chains are of this sort; for these are capable of much stretching and contracting. And those that are not of this sort are crumbly.

Kneadable things are those compressible ones that retain the compression; non-kneadable ones are either those that are wholly non-compressible or that do not retain the compression.

Some things are combustible, others non-combustible—for example, wood is combustible, as are wool and bone, while stone and ice are non-combustible. Combustible things are the ones that have ducts receptive of fire and liquid in their longitudinal ducts that is weaker than fire. But things that have no ducts or have liquid stronger than fire—for example, ice and very green woods—are non-combustible.

Capable of giving off fumes are those bodies that, though they contain liquid, do so in such a way that it does not evaporate separately when they are treated with burning heat; for vapor is a disaggregation due to burning heat, from liquid into air and wind, capable of wetting things. But fumes[135] can be disaggregated into air due to the passing of time, some drying out as they vanish, others coming to be earth. But this disaggregation is different [from vapor] because it does not wet things nor does it become wind. Wind is a continuous flow of air lengthwise, while fuming is the disaggregation all at once of a compound exhalation of dry and wet due to burning heat. That is why it does not wet things, but rather colors them. The fuming of a woody body is smoke. For I mean to also include bones, hair, and all such things in

135. Reading θυμιάματα.

this same class; for a name common to them has not been established. By analogy, however, they are all in the same class. As Empedocles said:

> Hair, leaves, and birds' thick feathers
> And scales on stout limbs are all the same.[136]

The fumes from fat are a sooty smoke, those from oily material a greasy steam. That is why olive oil does not boil or become coarse-grained, because it is capable of giving off fumes but does not evaporate, while water is incapable of giving off fumes but does evaporate. Sweet wine is capable of giving off fumes, because it is fat, and this produces the same effects as olive oil does; for cold does not solidify it, and it does burn. And though it is named "wine," it does not work like wine; for its flavor is not winey. This is also why it does not intoxicate in the way a random wine does. But it does give off a few fumes, which is why it makes the flames go up.

Combustible bodies seem to be the ones that dissolve into ashes. And all the ones that are solidified due to heat, or by both cold and heat, are so affected; for it is evident that all these are mastered by fire. But of stones, the gemstone called *anthrax*[137] is the least so.

Among the combustible things, some are flammable, others non-flammable, and of the former some can be carbonized. The flammable ones are the ones capable of producing flames, while those that are incapable are non-flammable. The flammable ones are the ones that, while not wet, are capable of giving off fumes. And pitch, olive oil, and wax are more flammable when mixed with other things than by themselves. Most flammable of all are the ones that make smoke go up. Among the ones of this sort, those that contain more earth than smoke can be carbonized.

Further, some meltable things are non-flammable (for example, bronze), some flammable bodies are unmeltable (for example, wood), while some are both meltable and flammable (for example, frankincense). The cause is that the wood has its liquid collected together and continuous throughout the whole, so that it burns out, while bronze has liquid in each part, though it is not continuous and is too little to produce flame. Frankincense, on the other hand, has it both ways.

Among things capable of giving off fumes, the flammable ones are the ones that are non-meltable because they are composed more of earth; for the dry is something they have in common with fire. And when this—the dry—becomes hot, fire is produced. That is why flame is wind or burning smoke. The fumes of wood, then, are smoke, those of wax, frankincense, and things of this sort, those of pitch, and of things containing pitch or the like, are a sooty smoke, while those of olive oil and oily things are a greasy steam. Those of things that burn very badly on their own are also [greasy smoke], because they contain little that is dry, and the change [to fire] is due to this, but do burn quickly together with something else. For the fat is [just] this:

136. B82 DK. Reading λεπίδες.
137. Probably ruby.

the dry oily. Liquids that give off fumes, then, are more wet, like olive oil and pitch, while those that burn are more dry.

4.10
Uniform Bodies

It is by these affections and by these differences, as we have said,[138] that the uniform bodies are distinguished from each other in accord with touch, and further with taste, smell, and color.

By uniform bodies, I mean, for example, metals (bronze, gold, silver, tin, iron, stone, and others of this sort, and those that become segregated out of these) and the ones in animals and plants (for example, fleshes, bones, sinew, skin, visceral body, hairs, fibers, veins), from which the non-uniform parts (for example, face, hand, foot, and others of this sort) are forthwith composed (and in plants, wood, bark, leaf, root, and things of this sort).

But since these are composed by another cause, but the matter of the things of which they are composed is the dry and the wet, that is, water and earth (for each most clearly has each of the capacities), while the affecting ones are the hot and the cold (for these latter produce composition and solidification from the former), let us get hold of which forms of uniform bodies are [composed of] earth, which of water, and which of a compound of them.

Among bodies that have been crafted, some are liquid, some soft, some hard. And of these, the hard ones and the soft ones are due to solidification, as was stated previously.[139]

Liquids that evaporate are composed of water. Those that do not are composed of earth, or of a compound of earth and water (for example, milk), of earth and air (for example, wood), or of water and air (for example, olive oil). And those that become coarse-grained due to heat are compounds. (But of the liquids, wine raises a puzzle. For it both evaporates and becomes coarse-grained, as new wine does. The cause is that wine is not said of only one form of thing, and each behaves differently; for new wine contains more earth than old, and so becomes most coarse-grained due to heat, but solidifies less due to cold; for it also contains much heat and earth. Thus, the wine in Arcadia gets so dried up in its skins due to the smoke[140] that it is scraped off for drinking. If, then, all wine has sediment, it will be composed of either one, earth or water, depending on the quantity of it that it contains.) Liquids that become coarse-grained due to cold are composed of earth. Those that become so due to both cold and heat are compounds of several things—for example, olive oil, honey, and sweet wine.

138. 384b7–385a10.
139. 382a22–27.
140. Reading ὑπὸ τοῦ καπνοῦ.

Among composed things, those solidified due to cold are composed of water (for example, ice, snow, hail, and frost), those solidified due to heat are composed of earth (for example, pottery, cheese, soda, salt), those solidified due to both—and those solidified by cooling, that is, by both a privation of heat and liquid departing with the heat, are of this sort (for salt is solidified by the privation of liquid alone, as are things composed of pure earth, while ice is solidified by the privation of heat alone)—are composed of both water and earth. That is why in fact it is due to both: they contained both.

All those from which all liquid has been evaporated (for example, pottery or amber) are composed of earth; for both amber and the bodies said to be like tears are due to cooling (for example, myrrh, frankincense, and gum; and [river] amber seems to be in this kind, and it solidifies—at any rate, it is evident that animals are enclosed in it, and the heat expelled due to the cold of the river, as with boiled honey when it is dropped into water, evaporates the liquid [in it]). And some of these are non-meltable and non-softenable by heat—for example, amber and certain stones, such as stalactites in caves; for these too come about in the same way, not due to fire but due to the cold expelling the heat, and the liquid coming out along with it due to the heat exiting from the thing, while in the case of the others, it is due to external fire. Those from which the liquid has not wholly evaporated, are composed more of earth, but are softenable by heat—for example, iron and horn. Frankincense and other things of this sort give off vapor in much the same way as wood.

Since things meltable by fire, at any rate, must be put down as meltable, these are mostly composed of water, though some are in fact a compound of water and earth—for example, wax. The ones meltable due to water are composed of earth, the ones not meltable due to either fire or water are composed either of earth or of both earth and water. **389^{a}1**

If, then, all [uniform] things are either liquid or solid, and the ones with the affections just mentioned belong among these, and there is nothing intermediate, all the ones we have mentioned would serve to determine whether a thing is composed of earth, water, or a compound of more than one of them, and whether it is composed due to fire, due to cold, or due to both.

Gold, then, and silver, bronze, tin, lead, glass, and many nameless stones are composed of water; for all these are melted by heat. Further, some wines, urine, vinegar, lye, whey, and serum are composed of water; for all of these are solidified by cold. Iron, on the other hand, and horn, nail, bone, sinew, wood, hair, leaves, and bark are composed more of earth. As, further, are amber, myrrh, frankincense, all the ones said to be tears, stalactites, and crops, such as pulse and corn; for things of this sort are to a greater or lesser extent composed of earth; for some are softenable by fire, while others are capable of giving off fumes and come to be by cooling. As, further, are soda, salt, and the kinds of stone that are neither due to cooling nor are meltable. Blood, on the other hand, and semen, are compounds of earth, water, and air. But blood that contains fibers is composed more of earth (which is why it is solidified by

cooling and melted by liquid), blood that contains no fibers is composed of water (that is why indeed it does not solidify), and semen is solidified by cooling when its liquid exits along with its heat.

4.11
Hot and Cold Liquids and Solids

What sorts of solids and liquids are hot and cold must now be investigated on the basis of what has just been said.

Bodies composed of water are for the most part cold, unless they contain alien heat—as, for example, do lye, urine, and wine. Those composed of earth are for the most part hot, because they are crafted by heat—for example, lime and ashes.

And it must be grasped that the matter is a sort of coldness; for since the dry and the wet are matter (for they are affectable), and of these earth and water are most of all the bodies (for they are determined by cold), it is clear that all bodies composed simply of one of these two elements are more cold, unless they contain alien heat—as, for example, do boiling water and water strained through ashes; for it too contains the heat from the ashes; for in everything that has been burned there is heat, either more or less. That is also why animals come to be in rotten things; for the presence of [alien] heat has destroyed the heat proper to the given thing.

Compound bodies contain heat; for most of them have been composed due to concocting heat, although some are products of putrefaction—for example, the colliquescences. So blood, semen, marrow, fig juice, and all things of this sort are hot as long as they possess their nature, but when they pass away and depart from their nature they are no longer so; for [only] the matter remains, this being earth or water. That is why they seem two ways to people, and some say they are cold, others that they are hot, seeing them to be warm when they are in their natural state, but to solidify when they are separated from it. But though this is the case, nonetheless, as we determined, things in which the matter is mostly water are cold (for water is most of all opposed to fire), while those in which it is mostly earth or air are hotter.

It sometimes happens, however, that the same things become extremely cold and hot due to alien heat; for the solidest and hardest ones are coldest if they are deprived of heat, and most of all cause burning if exposed to fire—for example, water then causes burning more than smoke and stone more so than water.

4.12
Transition to Biology

Since these things have been determined, let us speak in particular about what flesh is, or bone, or the other uniform things; for we grasp what the nature of the uniform

things is composed of, the kinds of them, and which kind each belongs to, through their coming to be; for the uniform things are composed from the elements, and of these as matter all the works of nature are composed.

But while all are composed as from matter from the things just mentioned, as regards substance it is by the account. This is always more clear in the case of the later ones and, in general, of the ones that are like instruments and for the sake of something. For it is more clear that a corpse is a human being homonymously. In the same way, therefore, the hand of a dead man is homonymously a hand, just as stone pipes too might be called "pipes"; for these [bodily parts] also seem to be instruments of sorts. **390^{a}1**

But the cases of flesh and bone are less clearly of this sort, and the cases of fire and water are less clear still; for the for-the-sake-of-which is less clear in those cases where the matter has the greatest extent; for just as, if one wished to take the extreme cases, matter is nothing beyond itself, and substance nothing other than an account, each intermediate thing is in proportion to the closer extreme, since any one of these is also for the sake of something, and is not entirely water or fire, as it is neither flesh nor viscera. And this is still more so in the case of a face and a hand. They are all defined by their work; for those capable of performing their own work are what each of them truly is—for example, an eye if it sees, but when it is incapable of doing so, it is homonymously an eye, like one that is dead or made of stone; for a wooden saw is not truly a saw either, but like one in a picture. It is the same way, therefore, with flesh as well; but the work of it is less clear than that of the tongue.

It is the same way with fire too, although presumably its work is yet less clear from a natural scientific point of view than the work of flesh. And similarly also with the [parts] in plants and inanimate things—for example, bronze and silver; for they all are [what they are] in virtue of a certain capacity to affect or to be affected, just like flesh and sinew. But the accounts of these are not exact, so that it is not easy to see clearly when they are [what they are] and when they are not, unless they have lost their capacity so exceedingly that only their shapes remain—for example, the bodies of ancient corpses suddenly become ashes in their graves, and fruits, when they are exceedingly old, [are fruits] only regarding their shape, though they do not appear to be so regarding their perceptible [taste]. So too with the solids that come from milk. **390^{b}1**

Parts of this sort, then, can come to be by virtue of heat and cold and the movements due to these, since they are solidified by hot and by cold—I mean the uniform ones, such as flesh, bone, hair, sinew, and the like; for these are all distinguished by the differences previously mentioned: elasticity, ductility, fragmentability, hardness, softness, and the others of this sort, all of which come about due to heat and cold and the mixing of their movements. But of the non-uniform parts composed of these—for example, a head, a hand, or a foot—no one could any longer believe this. On the contrary, although cold and heat and movement cause the coming to be of bronze and silver, of a saw, bowl, or box they are no longer the cause. Instead, in their case craft is the cause and in the previous one nature or some other cause.

If we grasp what kind each of the uniform parts is in, we must now get hold of what each of them is—for example, what blood is, or flesh, or seed, as well as each of the others; for we know why each thing is and what it is when we grasp either the matter or the account of their coming to be and passing away, but especially when we grasp both, and also know where the starting-point of movement comes from. And when these parts have been made clear, we must get a theoretical grasp on the non-uniform ones,[141] and in the end the things composed of these—for example, human being, plant, and the others of that sort.

141. *PA* 2–4.

DE ANIMA*

On the Soul

BOOK 1

1.1
Inquiry about the Soul

Since we suppose that knowing is a noble and an estimable thing, and one sort more so than another either in virtue of its exactness or by its being about better and more wondrous things, because of both these things we may quite reasonably place the study of soul in the first rank. It seems too that to truth as a whole, knowledge of the soul makes a great contribution, especially with respect to nature; for the soul is, as it were, a starting-point of living things. **402ª1**

And we are inquiring to get a theoretical grasp on, and to know, both the nature of the soul and its substance, and then as many things as are coincident with it—some of which seem to be special affections of the soul, while others seem to belong because of it to living things as well.

But in every way and altogether it is most difficult to attain any conviction concerning it. For in fact, since the inquiry is also common to many other things—I mean the one about the substance and the what-it-is—it might perhaps seem to someone that a single methodical inquiry is appropriate concerning all the things whose substance we wish to know, just as there is in fact demonstration of the coincidental special affections, so that it is necessary to search for this methodical inquiry. If, however, there is no single and common methodical inquiry concerning the what-it-is, our undertaking will be yet more difficult; for it will be necessary in each case to find out what the way [to inquire] is. But even if it is evident that it is demonstration or division or some other methodical inquiry, there will still be much puzzlement and much confusion as to what to base our inquiry on; for distinct things—for example, numbers and planes—have distinct starting-points.

First of all it is presumably necessary to determine to which of the kinds the soul belongs and what it is—I mean whether it is a this something and a substance or a quality, a quantity, or in some other of the categories that have been distinguished. Further, whether it is a potential being or rather a sort of actuality; for this makes no small difference. Also, it is necessary to investigate whether it has parts or is without parts, and whether all souls are of the same form, and if not of the same form, whether they differ in form or in kind. For, as things stand, people who speak and **402ᵇ1**

* Translated by C. D. C. Reeve. Text: K. Corcilius, *Aristoteles De Anima* (Hamburg, 2017).

inquire about the soul seem to investigate the human soul alone. And one must be careful not to overlook whether there is one account of the soul, as of living thing, or whether there is a distinct account of each (for example, of horse, dog, human, god)—living thing, the universal, being either nothing or posterior. And similarly if there is any other common thing predicated.

Further, if there are not many [sorts of] souls but rather [one sort of soul with] many parts, should one inquire about the whole soul or its parts? Again, it is difficult to determine which of the parts are naturally distinct from each other, and whether one should inquire about the parts first or their works—for example, understanding or the understanding, perceiving or the perceptual part, and similarly in the other cases. And if [we must investigate] the works first, again a puzzle might be raised about whether one should inquire about the corresponding objects before these—for example, the perceptible object before the part that can perceive, and the intelligible object before the understanding part.

It seems that not only is the knowledge of the what-it-is useful for getting a theoretical grasp on the causes of the coincidents connected to the substances[1] (as in mathematics knowing what the straight is and what the curved is, or what a line is and what a plane is, is useful for seeing how many right angles the angles of a triangle are equal to), but also, conversely, knowing these coincidents contributes in great part to knowing the what-it-is; for when we can give an account of these coincidents—of all or of most of them—that is in accord with what appears so, we will then be able to speak best about the substance too; for the starting-point of all demonstration is the what-it-is, so that insofar as definitions [of it] do not lead us to know the coincidents, or fail even to facilitate a likely conjecture about [how to demonstrate] them, it is clear that they have all been stated in a dialectical and empty way.

There is a puzzle too about the affections of the soul, as to whether they are all also shared by what has the soul or whether there is also some affection that is special to the soul itself; for though it is necessary to grasp this, it is not easy. But it appears that in most cases the soul is neither affected by nor does it act without the body (for example, being angry, being confident, having an appetite for things, perceiving in general), while understanding seems to be most of all special to the soul. Yet if it too is a sort of imagination, or does not exist without imagination, it would not be possible even for it to exist without a body.

If, then, some work or affection of the soul is special to it, it will be possible for it to be separated [from the body]. But if there is nothing special to it, it will not be separable, but will be like the straight, to which, insofar as it is straight, many coincidents belong—for example, it will touch a bronze sphere at a point, although, if separated, the straight will not touch it in this way; for it is inseparable, if indeed it always involves some body.

So too the affections of the soul—spiritedness, mild-manneredness, fear, pity, confidence, and further, joy, loving, and hating—would all seem to involve the body;

1. I.e., the intrinsic coincidents.

for at the same time as these, the body is affected in a certain way. This is evidenced by the fact that sometimes, though strong and vivid affections occur [in the soul], it is not provoked or frightened, while at other times it is moved by small and faint ones, as when the body is aroused (*orga[i]*) and its condition is like when one is angry (*orgizêtai*). It is yet more evident that this is so; for sometimes, though nothing frightening is occurring, people come to have the affections of a frightened person.

If this is so, however, it is clear that the affections of the soul are enmattered accounts. So their definitions will be of this sort, for example: "Being angry is a sort of movement of such-and-such a sort of body, or of a part or a capacity, as a result of this for the sake of that." And that is why it already belongs to the natural scientist to get a theoretical grasp on the soul, either all soul or this sort of soul.

A natural scientist and a dialectician, however, would define each of these differently—for example, what anger is. For a dialectician it is "a desire for retaliation" or something like that, while for a natural scientist it is "a boiling of the blood and hot stuff around the heart." Of these, the natural scientist gives the matter, the dialectician the form and the **$403^{b}1$** account. For this is the account of the thing, although it must be in matter of such-and-such a sort if it is to exist. And so of a house the account is this, that it is a shelter to prevent destruction by winds, rain, and heat. But one person will say that it is stones, bricks, and timbers, and another that it is the form in them for the sake of these other things.

Which of these people, then, is the natural scientist? Is it the one concerned with the matter but ignorant of the account, or the one concerned with the account alone? Or is it rather the one concerned with what is composed of both? Who, then, is each of the others? Or is there not someone who is concerned with the affections of the matter that are not separable and insofar as they are not separable? Or is the natural scientist rather the one who is concerned with everything that is a work or affection of this sort of body and this sort of matter? And isn't anything, insofar as it is not of this sort, the concern of someone else, in some cases a craftsman, if there happens to be one, such as a builder or a doctor? And aren't those things that are not separable, but are considered insofar as they are not affections of this sort of body and in abstraction from it, the concern of the mathematician? And insofar as they are separate, that of the primary philosopher?

But let us return to where our account began. We were saying that the affections of the soul are not separable from the natural matter of living things, in just the way, in fact, that things of this sort—spiritedness and fear—are not, and not in the way that line and plane are.

1.2
Movement, Perception, Incorporeality

In our investigation concerning the soul it is necessary to go through the puzzles from which we must become free by going through them first, and at the same time to

gather the beliefs of those of our predecessors who declared any views on the subject, so that we may take what is correct in what they say, and, if anything is incorrect, guard against it.

A starting-point of our inquiry is to set out the things that seem most of all to belong to the soul in accord with nature. What is animate, then, seems to differ from what is inanimate most of all in two regards: moving and also perceiving. And we have also gathered from our predecessors pretty much these two things concerning the soul; for some say that soul is both most of all and primarily what causes movement. And thinking that what was not itself in movement could not possibly move something else, they took the soul to be a thing that is in movement.

404a1 That is what led Democritus to say that the soul is a sort of fire and heat; for the shapes and atoms are unlimited and those that are spherical, he says, are fire and soul—which are like the so-called motes in the air that appear in the sunbeams that come through our windows. The universal seedbed of them, he says, are the elements of the whole of nature; Leucippus says the same. Of those the spherical ones are the soul, because, being of such a shape, they are especially capable of moving through everything and, because they are themselves moving, of moving the rest, on the supposition that the soul is what imparts movement to animals. That is also why they make breathing the defining mark of being alive; for when the surrounding air compresses their bodies, it squeezes out those atomic shapes which, because they are never at rest themselves, impart movement to animals. Then aid comes from outside by the entry of other similar atoms in the process of breathing; for these prevent the squeezing out of those that are already within the animal, helping to counteract what is doing the compressing and solidifying. And living continues just so long as they are capable of doing this.

What the Pythagoreans say seems to contain the same thought; for some of them said that the motes in the air are soul, others that it is what moves them. The reason they spoke in terms of these motes is because they are manifestly in continuous movement, even when it is completely calm. And those who say that the soul is what moves itself tend in the same direction; for all these thinkers seem to have supposed that movement is what most properly belongs to the soul, and that all other things are moved because of the soul, while it is moved by itself; this is because of never seeing a mover that is not itself moving.

Similarly, Anaxagoras says that soul is what moves things, as does anyone else who says that understanding caused the universe to move. But his position is not altogether, at any rate, like that of Democritus. For the latter, soul and understanding are unconditionally the same; for what is true is what appears—which is why (in his view) Homer put it well when he said, "Hector lying there thinking altered thoughts."[2] Democritus, then, does not treat the understanding as a capacity concerned with truth, but says that soul and understanding are the same. Anaxagoras,

2. The reference is to *Iliad* 23.698. The lines refer to Eurylaus, not Hector. See *Met.* 1009b28.

on the other hand, says less perspicuous things about them; for in many places he says **404b1**
that understanding is the cause of what is in a noble and correct way, but elsewhere
that understanding is the soul; for understanding belongs to all living things, great
and small, estimable and less estimable. But understanding—in the sense of wisdom—
appears not to belong in the same way to all animals, not even to all humans. 5

Those, then, who have looked to the movement of what is animate took the soul
to be what is most capable of moving things, while those who looked to knowing
and perceiving beings said that the soul was their starting-points, some positing a
plurality, others one starting-point. Thus, Empedocles says that it is composed of all 10
the elements, each of these also being soul. He says:

> For by earth, we see earth, by water, water,
> By ether, divine ether, but by fire blinding fire,
> By love love, and strife by baneful strife.[3] 15

And in the same way Plato in the *Timaeus*[4] generates the soul from the elements;
for like is known by like, and things are composed of the starting-points. And sim-
ilarly in *On Philosophy*[5] it was determined that the animal-itself is composed of the 20
Form-itself of the one and the primary length, breadth, and depth, and the other
things in the same way. Further, this has also been put in another way: understanding
is the one, scientific knowledge the two (for it proceeds in a single way toward one
thing), belief is the number of the plane, and perception that of the solid. For the
numbers, though they are said to be the Forms themselves and the starting-points, are
nonetheless generated from the elements.[6] And some things are discerned by under- 25
standing, others by scientific knowledge, others by belief, others by perception—and
these numbers are the Forms of things.

On the other hand, since the soul seemed to be both capable of moving things
and, in the way that was mentioned, capable of knowledge, some thinkers[7] generated
it from a combination of both and declared the soul to be a self-moving number. 30

People differ with each other, however, about the starting-points, about what sort
they are and how many they are, especially those who make them corporeal with
those who make them incorporeal, and these with those who mix them and draw **405a1**
their starting-points from both differ. They also differ as to their number; for some
speak of one, others of a plurality. And they consequently differ too in the accounts
they give of the soul; for they not unreasonably took it that the nature capable of
causing movement must be among the primary things. This is what led some to 5

3. B109 DK.
4. 35a–b.
5. The reference is probably to Aristotle's own dialog *On Philosophy*.
6. *Met.* 987^b21–22.
7. E.g., Xenocrates of Chalcedon.

believe that it is fire; for fire is both the most fine-grained and most incorporeal of the elements, and furthermore is moved and also moves other things in a direct way.

Democritus spoke more subtly than others when revealing why [the soul] has each of these characteristics; for soul and understanding are [for him] the same thing, and this is among the primary and indivisible bodies, and its capacity to move things is due to the smallness of its particles and their shape. But of the shapes, the most easily moved, he says, is the spherical, and both the understanding and fire are of this sort.

Anaxagoras, while seeming to speak of soul and understanding as distinct, as we also said previously,[8] treats them both as a single nature, except that he regards understanding above all as, at any rate, the starting-point of everything. At any rate, he says that it alone of the beings is simple, unmixed, and pure. And he assigns both knowing and causing movement to the same starting-point, when he says that understanding set the universe moving.

Thales too, to discern from what is recounted about him, seems to have taken the soul to be something capable of moving things, if indeed he said that a magnet has a soul because it moves iron.

Diogenes, however, as well as some other people, took the soul to be air, thinking that of all things air is composed of the smallest particles and is a starting-point. And that is why the air knows and moves things—insofar as it is a primary thing from which the rest derive, it knows things; and insofar as its particles are the smallest, it moves them.

Also, Heraclitus says that the starting-point is soul, if indeed it is the "evaporation" from which the other things are composed, and furthermore that it is the least corporeal thing and always flowing, and that it is by something moving that something moving is known. And he thinks that the beings are in movement, as most thinkers do.

Alcmaeon too seems to take the soul in much the same way to these; for he says that it is immortal because it resembles immortal things, and that this affection belongs to it because it is always in movement; for divine things too—the moon, the sun, the stars, and the whole heaven—are always in continuous movement.

Among the cruder thinkers, there have been some, such as Hippo, who have declared the soul to be water. They seem to have been persuaded of this from seed, because the seed of all things is wet. For in fact Hippo refutes those who say that the soul is blood, on the grounds that the seed is not blood, and that seed is the primary soul. But others, like Critias, have said the soul is blood. They take perceiving to be what most properly belongs to soul, and that this belongs to it because of the nature of blood. For each of the four elements has found some judge in its favor, except earth. No one declares *it* to be soul, unless there is someone[9] who has said that it is composed of all the elements or is all of them.

8. 404b1–7.
9. 404b11–15.

All, then, define the soul by (one might almost say) three characteristics: moving, perceiving, being incorporeal. And each of these is referred back to the starting-points. That is why those who define it by knowing either make it an element or composed of the elements, all speaking in much the same way as each other, except for one; for like, they say, is known by like; for since the soul knows all things, they let it be composed from all the starting-points. Those, then, who say that there is one cause and one element also regard the soul as one (for example, fire or air), while those who speak of a plurality of starting-points also make the soul a plurality. Anaxagoras alone says that the understanding is unaffectable and has nothing in common with any of the other things. But how, if it is like that, it will know anything and due to what sort of cause, he does not say, nor is it evident from the things he has said.

Those who make contrarieties their starting-points also let the soul be composed from contraries, while those who make one or other of the two contraries such—for example, hot or cold, or something else of that sort—likewise regard the soul too as one of these. That is why they also allow themselves to be guided by the names. Those who pick the hot say that it is also because of this that *to zên* (life) is so named [because *zein* means "to boil"] while those who pick the cold say that it is because of the process of breathing and cooling (*katapsuxis*)—that *psuchê* (soul) is so named.

These, then, are the views about the soul that have been handed down, as well as the causes due to which they are stated in the way they are.

1.3
Soul as a Starting-Point of Movement

First movement must be investigated; for perhaps it is not merely false that the substance of the soul is the sort of thing that it is said to be by those who say that the soul is what moves—or is capable of moving—itself, but rather for movement to belong to the soul is something impossible. **406^{a}1**

That it is not necessary for what moves things to be itself moving was stated previously.[10] For there are two ways in which anything can be moving—either with reference to something else or intrinsically. By "with reference to something else" I mean things that are moving because they are in something that is moving—for example, sailors; for they are not moving in the same way as the ship; for the ship is moving intrinsically, while they are moving because they are in something that is moving. This is clear in the case of the parts [of the body]; for the movement that properly belongs to the feet is walking, and this is also the movement that properly belongs to humans. But it does not belong to the sailors in the present case. Since, then, things are said to be moving in these two ways, we are now investigating about the soul whether it is moving, and participates in movement, intrinsically.

10. 403^{b}30–31.

There are four sorts of movement—spatial movement, alteration, withering, and growth. It is, then, with one or more or all of these that the soul would move. But if it is moved non-coincidentally, there would be a movement that belongs to it by nature, and, if this is so, place will so belong to it as well; for all the sorts of movement that were mentioned occur at a place. But if the substance of soul is to move itself, movement will not belong to it coincidentally, as it does to the pale or three cubits in length; for these are also moved, but coincidentally; for it is what they belong to that is moved, namely, the body. That is also why they have no place belonging to them; but the soul will have a place, if indeed it is by nature that it participates in movement.

Further, if it is moved by nature, it will also be moved by force, and if by force, then also by nature. And it is the same way with rest as well; for what something by nature moves toward, it also rests in by nature. Similarly, what it moves toward by force, it also rests in by force. But what sorts of things forced movements and rests of the soul are, it is not at all easy to give an account of, even if we wished to fabricate one.

Further, if the natural movement of the soul is upward, it will be fire, if downward, earth; for it is to these bodies that these movements belong. The same argument also applies to the intermediate ones.[11]

Further, since it is evident that the soul moves the body, it is reasonable to suppose that it moves it with the same movements with which it is itself moved. But if this is so, then, reversing the order, it is also true to say that the ones with which the body is moved are also the soul's. The body moves with spatial movement, so that the soul too would change in accord with the body, either moving as a whole or with respect to its parts. But, if this is possible, it would also be possible for a soul that had gone out of a body to enter it again, and from this would follow the possibility of the resurrection of animals that have died.

Coincidental movement of the soul may indeed be caused by something else; for an animal may be pushed along by force. But something whose substance included being moved by itself cannot be moved by something else, except coincidentally—just as what is intrinsically good or good because of itself cannot be good because of something else or for the sake of something else. Yet one would say that it is most of all by perceptible objects that the soul is moved, if indeed it is moved at all. But then again if the soul *does* move itself, it would itself also be moved. So if all movement is a displacement of what is moved insofar as it is moved, the soul too must be displaced from its substance, if it does not move itself coincidentally but, rather, movement belongs to its substance intrinsically.

Some people even say that the soul moves the body in the way in which it is itself moved—for example, Democritus, who speaks in much the same way to Philippus, the comic dramatist; for he says that Daedalus made the wooden statue of Aphrodite move by pouring quicksilver into it. Democritus speaks in the same way; for he says that the undivided spheres,[12] which are moving because by nature they can never remain still,

11. I.e., water and air.
12. I.e., the spherical atoms.

draw the whole body after them and so produce its movements. But do these same spheres, we will ask, produce rest as well? How they could do so it is difficult, or even impossible, to say. And, in general, it does not appear to be in this way that the soul moves the animal, but rather through a sort of deliberate choice and understanding.

In the same way, Timaeus[13] gives a natural scientific account of how the soul moves the body; for by its own movement it moves the body as well, because of being woven together with it. For when it had been constituted from the elements and divided into parts in accord with the harmonic numbers, in order that it might have a native perception of harmony and that the universe might move in harmonic revolutions, he bent the straight line into a circle, and, having divided the one circle into two, intersecting at two points, he again divided one of these into seven, the spatial movements of the heaven being regarded as the movements of the soul.[14]

In the first place, to say that the soul is a spatial magnitude is not correct; for by the soul of the universe Timaeus clearly means the sort of soul that is called the understanding (for it certainly cannot be the perceptual soul, or the appetitive soul; for the movement of these is not circular spatial movement). And the understanding is one and continuous in the same way as the activity of understanding, and the activity of understanding as the intelligible objects.[15] These are one by succession, however, just like number, but not like spatial magnitude. That is why the understanding is also not continuous in that way, but either is without parts or continuous in a way different from a continuous magnitude. For how, indeed, could the understanding, if it is a spatial magnitude, even understand anything with any of its parts whatever? It will do so with its parts being regarded either as magnitudes or as points (if a point is even to be called a "part"). If it is with parts regarded as points, since these are unlimited in number, clearly the understanding will never get through them all. If it is with parts regarded as magnitudes, the understanding will understand the same thing many or an unlimited number of times. But it is manifestly possible to do so even once. And if it is enough for it to touch with any of its parts whatever, why should it move in a circle, or have magnitude at all? But if it is necessary for understanding that the whole circle touch its object, what does the touching *by the parts* consist in?

Further, how will what is without parts understand what has parts, or what has parts understand what is without parts? It must be the understanding that is the circle in question; for the movement of the understanding is understanding, while that of a circle is revolution. If, then, understanding is revolution, the understanding would be the circle to which this sort of revolution belongs. What, then, will it always be understanding (for there must be something, if indeed the revolution is eternal)? For although of all practical understandings there are limits (for they are all for the sake of other things), all theoretical ones are determined in a similar way to accounts. But

13. Plato, *Timaeus* 36e.
14. Plato, *Timaeus* 33b–34b. The seven movements referred to are the orbits of the moon, sun, Venus, Mercury, Mars, Jupiter, and Saturn.
15. 430ᵇ14–15, *Sens*. 448ᵇ19–20.

every account is either a definition or a demonstration. And a demonstration is both from a starting-point and has a sort of end: the deduction or the conclusion. But even if they do not terminate, at any rate, they do not return again to the starting-point, but, repeatedly taking middle and extreme terms, proceed in a straight line, while a revolution does bend back again toward the starting-point. Definitions too are all finite.

Further, if the same revolution comes about many times, the understanding must think the same thing many times.

Further, understanding something is more like a coming to rest or coming to a stop than a movement, and it is the same way with a deduction.

But then what is moving not easily but by force is certainly not blessed either. And if movement is not its substance, the soul would be moved against its nature.

On the other hand, the intermixing of the body with the soul without the possibility of release is laborious—more than that, it is something to be avoided, if indeed it is better for the understanding not to be involved with the body, as is customarily said and seems to many people to be so.

Also, the cause of the circular spatial movement of the heaven is unclear [from what Timaeus says]; for the substance of the soul is not the cause of the circular spatial movement (on the contrary, that sort of movement is coincidental to it) and neither is the body (on the contrary, it is rather the case that the soul causes the body's movement).

But then it is not said either why this movement is better. And yet it was supposed to be because of this that the god makes the soul move spatially in a circle, because movement is better for it than remaining at rest, and that this sort of movement better than any other. But since this sort of investigation properly belongs to other accounts,[16] let us leave it aside for now.

There is another absurdity, however, that follows both from this account and from most of the ones concerning the soul; for in fact they attach the soul to a body, and place it in a body, without further determining the cause due to which this attachment comes about or the condition of the body required for it. And yet this would seem to be necessary; for it is because of their association that the one acts, while the other is acted upon, and the one is moved, while the other moves it. None of these relations holds between random things.

These people, however, merely undertake to say what sort of thing the soul is, but about the sort of body that is receptive of it they determine nothing further, as if it were possible, as in the Pythagorean stories, for any random soul to be inserted into any random body; for it seems that each body has its own special form and shape. But what they say is much the same as saying that the craft of building could be inserted into pipes; for while the craft must use its instruments, the soul must use its body.

16. Perhaps those in *Met.* 12.10.

1.4
Soul as a Harmony and as a Self-Moving Number

There is also another belief handed down about the soul, which many find no less plausible than those we have mentioned, and which has given an account of itself—under examination, as it were—in the common accounts too. For its supporters say that the soul is a sort of harmony; for a harmony (they say) is a blend and a composition of contraries, and the body consists of a combination of contraries. And yet, while a harmony is a sort of ratio or composition of the things that are mixed together, the soul cannot possibly be either of these.

Further, a harmony cannot move anything, yet everyone assigns this to the soul as its (one might almost say) chief characteristic. But it is more fitting to speak of **408^{a}1** harmony in connection with health and bodily virtues in general than in connection with the soul. This becomes most evident if we try to assign the affections and works of the soul to some sort of harmony; for it is difficult to make them fit.

Further, if we speak of harmony, we have in view two cases. One, the strictest one, is that of the spatial magnitudes in things that have movement and position, where harmony consists in their being positioned together, whenever they so fit together that nothing of the same kind can intervene; the other is that of the ratio of the things that are mixed together. Neither of the two makes the doctrine reasonable. And if the harmony is the composition of the parts of the body, it makes it very easy to criticize. For the compositions of the parts are many and various. What, then, should one suppose the understanding to be a composition of, and in what way? Or the perceptual part or the desiring part? It is similarly absurd, however, for the soul to be a ratio of the mixture; for the mixture of the elements is not in the same ratio in flesh as in bone. It will follow, then, that a thing has many souls and that they are found throughout the whole body, if indeed all [its parts] result from mixtures of the elements, and the ratio in the mixture is a harmony—that is, a soul.

(One might ask the same question of Empedocles; for he says that each of the parts exists by virtue of some ratio. Is the soul, then, the ratio, or rather, being a distinct thing, does it come about in the parts? Further, is love the cause of any random mixture, or of the one that is in accord with the ratio, and is love the ratio or a distinct thing beyond the ratio?)

These, then, are the sorts of puzzles that arise.

On the other hand, if the soul is something distinct from the mixture, why, then, is the being for flesh and that for the other parts of the animal destroyed at the same time?

In addition to these points, if indeed each of the parts does not have a soul, if the soul is not the ratio of the mixture [in it], what is it that passes away when the soul leaves it behind?

That the soul cannot be a harmony, then, and cannot revolve in a circle is clear from what has been said. But coincidentally it can be moved, as we said,[17] and can move itself—for example, what the soul is in can be moved and it, in its turn, be moved by the soul. In no other way, though, can it possibly be moved with respect to place.

One might more reasonably raise a puzzle about how the soul is in movement, **408b1** though, by looking to the following considerations. For we say that the soul is pained, enjoying, feeling confident, feeling afraid, and further, feeling angry, and also perceiving and thinking. And all these seem to be movements. Hence one might think that the soul itself is being moved. But this is not necessarily so. For even if it is the case that being pained or enjoying or thinking are in the highest degree movements, and that each is a being moved, and that its being moved is due to the soul, as being angry or being afraid is the heart being moved in this way, with thinking being something of this sort or perhaps something else being moved, and these come about in some cases by the spatial movement of certain things with respect to place and in others by their alteration (which ones and in what way is for another account[18])—[even if all that is so,] to say that the soul is feeling angry is like saying that the soul is weaving or building; for it is better, perhaps, not to say that the soul is feeling pity or learning or thinking, but rather that a human being is doing so by means of the soul. And this, not because the movement is in the soul, but because sometimes it reaches as far as the soul, and sometimes begins from it—for example, perception begins from particular things, while recollection begins from the soul and extends to the movements or the traces in the perceptual organs.

The understanding, though, seems to be born in us as a sort of substance, and not to pass away. For if it could pass away, it would most of all be due to the feebleness of old age, but as things stand perhaps it is presumably what happens in the case of the perceptual organs; for if an old man could get such-and-such a sort of eye, he would see as well as a young one does. So old age is not due to the soul's being affected in a certain way but, rather, what the soul is in, as in episodes of drunkenness and disease. And, in particular, understanding—that is, contemplating—are extinguished because something else within passes away, but it itself is unaffectable. For thinking and loving or hating are not affections of it but of this [human being] here that has it, insofar as it has it. That is why when this passes away it neither remembers nor loves; for they were not [affections] of it, but of what is common,[19] which has passed away. But the understanding is perhaps something more divine and is unaffectable.

That the soul cannot be moved, then, is evident from these considerations. But if it cannot be moved at all, clearly it does not move itself.

The most unreasonable of the views mentioned is that which says that the soul is a self-moving number; for its supporters are subject to impossibilities, first, to those

17. 406b5–7.
18. 3.9–10, *MA*.
19. 430a17–25.

that stem from the soul's being moved, and then to the ones special to it, which stem from saying that it is a number. For how is one to understand a unit as being in movement? By what is it moved, and in what way, since it is without parts and without difference? For if it is capable of moving things and of being moved, it must admit of difference. **409a1**

Further, since they say that a line when moved makes a surface, and a point a line, the movements of the units will also be lines; for a point is a unit that has position, and the number of the soul is, of course, somewhere and has position. 5

Further, if one subtracts a number or a unit from a number, another number remains, while plants and many animals, when divided, continue to live and seem to have the same form of soul.

Besides, it would seem to make no difference whether one speaks of units or tiny bodies; for in fact if the tiny spheres of Democritus became points, with only quantity remaining, there will be in it a mover and a moved, just as there is in a spatially continuous thing; for it is not because of a difference in its greatness or smallness that what was mentioned follows, but because it is a quantity. That is why there must be something that will move the units. But if in an animal the mover is the soul, it must also be so in the number [with which the soul is identified], so that the soul will not be the mover *and* the moved but the mover only. How, then, can this possibly be a unit? For it must be different in some way from the other units. But for a point that is a unit, what difference could there be except position? If the units—that is, the points—in the body are distinct [from the units in the soul number], the units will be in the same place as they are; for the unit will occupy the space of a point. And yet what prevents an unlimited number of things from also being in the same place if two can be? For things whose place is indivisible are so themselves. If, on the other hand, the points in the body are the number of the soul, or if the number of the points in the body is the soul, why do not all bodies have a soul? For there seem to be points in all of them—in fact, an unlimited number. 10 15 20 25

Further, how is it possible for the points to be separated and set free from the bodies, if, at any rate, lines do not divide up into points?[20] 30

1.5
Soul as Composed of Elements

The result, as we said,[21] is that in a way this view [that the soul is a number] says the same thing as those who posit that the soul is some sort of fine-grained body, while in another way, like Democritus saying that movement is caused by the soul, it has a special absurdity of its own. For if indeed the soul is present in every part **409b1**

20. Lines here are analogs of souls. See 409a4–7.
21. The reference is presumably to 408a9–11.

of the percipient body, there will necessarily be two bodies in the same place, if the soul is a sort of body. For those, on the other hand, who say that the soul is a number, there will be many points in one point, or every body will have a soul, unless it is of a different sort from the number that comes to exist in the body and is distinct from the points present in it. It also results that the animal is moved by the number in the way that Democritus said something moved it; for what difference does it make whether one speaks of small spheres, large units, or simply spatially moving units? For either way it is necessary for them to move the animal by being themselves moved.

For those, then, who combine number and movement in the same thing these are the consequences, as well as many others of the same sort; for it is not only impossible for something of this sort to be the definition of soul, it cannot even be a coincident of it. And this would be clear if one were to try on the basis of this account to give one of the affections and works of the soul—for example, rational calculations, perceptions, pleasures, pains, and other things of this sort; for, as we said previously,[22] it is not even easy to conjure up one on this basis.

Three ways have been handed down in which people define the soul. Some have declared it to be what is most capable of moving things, since it moves itself; others that it is a body that is the most fine-grained or least corporeal of all. We have pretty much gone through the puzzles and inconsistencies that these involve. It remains to investigate what it means to say that the soul is composed of the elements. For they say this in order that it may perceive the beings and know each of them. But many impossibilities necessarily follow for this account.

For they posit that knowing is of like by like, as if positing that the soul is the things [it knows]. But there are not only these [elements] but also many other things, or perhaps rather an unlimited number, composed of them. As for the things from which each of these is composed, let it be granted, then, that the soul knows and perceives them; but with what will it know or perceive a compound—for example, what god, human, flesh, or bone is? And similarly for any other composite thing; for it is not when in any state whatever that the elements are each of these, but when in a certain ratio and composition, as Empedocles says of bone:

> The pleasant earth in its well-wrought melting pots
> Got two parts of glittering water, out of its eight parts,
> And four of fire; and so white bones were formed.[23]

There is no benefit, then, in the elements being in the soul if the ratios and the composition will not also be present; for each [element] will know its like, but there will be nothing to know bone or human, if these will not also be present. But that this is impossible there is no need to say. For who would raise a puzzle as to whether

22. 408ᵃ4–5.
23. B96 DK.

a stone or a human is present in the soul? Likewise with the good and the not good, and in the same way with other things.

Further, given that things are said to *be* in many ways (for it signifies, on the one hand, the this something and, on the other, quantity, quality, or some other of the categories that have been distinguished), will the soul be composed of all these or not? But there do not seem to be elements common to all of them. Is it composed, then, of the elements of substances and only of them? How, then, will it also know each of the others? Or will they say that there are elements and starting-points special to each kind and the soul is composed of these? It will then be quantity, quality, and substance. But it is impossible from the elements of quantity to compose a substance and not a quantity.

For those, then, who say that the soul is composed of all the elements, these, and others like them, are the difficulties that follow.

It is also absurd to say both that like is unaffectable by like and also that like perceives like and the like knows by like. But they posit perceiving as a sort of being affected and moved, and likewise both understanding and knowing.

And there are many puzzles and difficulties with saying, as Empedocles does, that it is by its corporeal elements that each thing is known, that is, in relation to its like, as what has been said testifies; for the parts of the bodies of animals that are simply earth—for example, bones, sinews, and hair—seem to perceive nothing. So they do not even perceive their like. And yet this is what should properly happen. **410^{b}1**

Further, to each of the starting-points more ignorance than comprehension will belong; for each will know one thing, but be ignorant of many—in fact, of all the others. A consequence for Empedocles, at any rate, is that the god will be the least wise thing of all; for he alone will not know one of the elements, strife, while mortals will know everything, for each is composed of all the elements. And, in general, due to what cause does not every being have a soul, since every one is either an element or composed of one element, or of several, or of all? For it is necessary for one, or some, or all of them to have knowledge.

One might also raise a puzzle as to what exactly it is that makes these one; for the elements seem to be like matter; for the most controlling factor, whatever it is, seems to be what holds them together. But it is impossible that anything should be stronger than the soul and a ruler of it—and yet more impossible in the case of the understanding; for it is reasonable for this to be by nature the most primordial thing and a ruler, while they say that the elements are the first of [all] beings.

All of them, both those who say that because the soul knows and perceives the beings it is composed of the elements, and also those who say that it is the thing most capable of moving, are not speaking about all soul. For not all perceiving beings are capable of moving (for there appear to be certain animals that remain stationary with respect to place, and yet movement with respect to place seems, at any rate, to be the only sort of movement that the soul causes in the animal). It is the same way with those who produce the understanding and the perceptual part from the elements; for

plants manifestly live without sharing in spatial movement or perception, and among animals many do not have thought.

But even if one were to set aside these points and take the understanding to be a part of the soul, and the perceptual part likewise, one would still not, speaking in this way, be speaking in universal terms about all soul or about the whole of any one soul. This is also what happens with the account in the so-called Orphic poems; for it says that the soul, being carried by the winds, enters in from the whole when breathing occurs. But that cannot happen either in the case of plants or in that of some animals, if indeed not all of them breathe; a point that escaped the holders of this view.

Also, if the soul must be produced from the elements, it need not be from all; for one part of a pair of contraries is sufficient to judge both itself and its opposite; for by the straight we know both itself and the crooked; for the standard straightedge is a judge of both, while the crooked is a judge neither of itself nor of the straight.

There are some too who say that the soul is mixed together in the Whole. Presumably that is why Thales thought that all things were full of gods. But this involves certain puzzles. For due to what cause does the soul in air or fire not produce an animal, while in mixtures it does—even though it seems to be of higher quality in the former? (One might also investigate what the cause is due to which the soul in the air is of higher quality and more immortal than the soul in animals.) Both ways an absurdity results and something contrary to reason; for in fact to speak of fire or air as an animal is entirely reckless, and not to speak of them as animals if there is soul in them is absurd.

They seem to assume that the soul is in these [elements], because the whole is the same in form as its parts, so that it is necessary for them to say that the soul too is the same in form as its parts, if it is by a part of the surrounding element being cut off and enclosed in animals that they become living beings. But if the divided part of air [in the animal] remains the same in form, while the soul has non-uniform parts, it is clear that some [part] of soul will be present in it, while some will not. It is necessary, then, either for the soul to be uniform or for it not to be present in any and every part of the universe.

It is evident, then, from what has been said that knowledge does not belong to the soul because the soul is composed of the elements, and that it is not correctly or truly said, either, that it is in movement.

Since, however, knowing does belong to the soul, as well as perceiving and also believing, and furthermore having an appetite for things, wishing, and desires in general, and since movement with respect to place comes about in animals in virtue of the soul, as, furthermore, do growth, prime of life, and withering, one must ask whether each of these belongs to the whole soul—that is, is it with the whole soul that we understand and also perceive and are moved, and, in the case of each of the others, are affected or do things, or distinct ones with distinct parts? And what about life? Does it reside in some one of these, or in several, or in all, or is something else the cause?

Some people say that the soul has parts, and that it understands with one part and has an appetite for things with another. But what exactly is it, then, that holds the soul together, if it by nature has parts? For surely it is not the body, at any rate; for it seems, on the contrary, that it is rather the soul that holds the body together. At any rate, when it departs, the body disperses in vapor and putrefies. If, then, it is something else that makes the soul one, that other thing would be most of all soul. But then we will have to inquire again as to whether it is one or multipartite. For if it is one, why isn't the soul directly one? And if it has parts, the argument will again inquire as to what holds it together, and in this way will go on without limit.

One might also raise a puzzle about the parts of the soul as to what capacity each has in the body. For if the whole soul holds all of the body together, then each of the parts should properly hold together some part of the body. But this seems impossible; for about what part the understanding will hold together, and how it will do so, it is difficult even to fabricate something.

It is evident too that both plants and—among animals—some insects continue to live when divided, as having the same form of soul, even if not numerically the same one; for each of the parts has perception and is moved with respect to place for a certain time. And if they do not continue to do so, there is nothing strange in that; for they do not have the instrumental parts necessary to preserve their nature. But nonetheless in each of the segments all the parts of the soul are present, and they are the same in form as each other and as the whole—as each other, because they are not separable, as the whole soul, because it is divisible. The starting-point in plants also seems to be a sort of soul; for this alone is common to both animals and plants, and it is separate from the starting-point of perception, while nothing has perception without it.

BOOK 2

2.1
First Definition of Soul

So much, then, for the views handed down by our predecessors concerning the soul. **412^a1** Let us go back again and start afresh, as it were, and try to determine what the soul is and what account of it would be most common.

We say, then, that one kind of being is substance, and of this, one sort is as matter, which intrinsically is not a this something, and another is shape and form, on the basis of which something is already said to be a this something, and a third, what is composed of these. And matter is potentiality, while form is actuality—and this in two ways, as scientific knowledge is and as contemplating is.

It is bodies that seem most of all to be substances, and among these, the natural ones; for these are starting-points for the others. Among natural bodies, some have

life, while some do not have it. And by "life" we mean self-nourishment, growth,
15 and decay. So every natural body that participates in life would be a substance, but a substance as a composite is. But since it is also a body of such-and-such a sort, for it has life, the body would not be soul; for the body is not among the things that are predicated of an underlying subject, but instead is as underlying subject and matter.

20 It is necessary, then, for the soul to be substance as form of a natural body that has life potentially. But substance is actuality. Therefore, it is the actualization of such a body. But something is said to be actual in two ways, either as scientific knowledge is or as contemplating is. And it is evident that it is as scientific knowledge is; for both
25 sleep and waking depend on the presence of the soul; and waking is analogous to contemplating, while sleep to having but not activating [scientific knowledge]; and in the same individual scientific knowledge is prior in coming to be. That is why the soul is the first actualization of a natural body that has life potentially.

412b1 This sort of body would be one that is instrumental. And even the parts of plants are instruments, although extremely simple ones—for example, the leaf is a covering for the pod and the pod for the fruit, and the roots are an analog of the mouth; for both take in nourishment.

If, then, one must state something that is common to all soul, it would be that
5 it is the first actualization of a natural instrumental body. That is why one should not inquire whether the soul and the body are one, any more than the wax and the shape, or, in general, the matter of a given thing and that of which it is the matter; for while one and being are said of things in many ways, the strict way is of the actuality.

It has now been stated in universal terms what the soul is; for it is the substance
10 in accord with the account. And this is the essence of this sort of body, just as if one of our instruments—for example, an axe—were a natural body; for its substance would be the being for the axe, and this would be its soul. And if this were separated
15 from it, it would not still be an axe, except homonymously; but as things stand, it is an axe. For it is not of this sort of body that the essence and the account is the soul, but of a certain sort of natural body that has a starting-point of movement and rest within itself.

One must get a theoretical grasp on how what has been said applies also in the case of the parts [of the body]. For if the eye were an animal, sight would be its soul; for that is the substance of an eye, the one in accord with the account. And the eye is
20 matter for sight, and if this fails, it is no longer an eye, except homonymously, like an eye in stone or in a picture. One must now apply what holds in the case of the part to the whole living body; for as the part is in relation to the part, so analogously is
25 the whole of perception in relation to the whole body that is perceptual, insofar as it is such. But it is not what has lost its soul that is potentially such as to live, but what has it; and the seed and the fruit are potentially a body of this sort.

As, then, cutting and seeing, so too is being awake an actuality, and as sight and the capacity of the instrument are, so is the soul, while the body is what is potentially **413a1** [alive]. But just as the eye-jelly plus sight is an eye, so in this case the soul plus the body is an animal.

That the soul, then, is not separable from the body—or that certain parts of it 5 are not, if it naturally has parts—is not unclear; for of some parts [of the soul] the actualization is the actualization of the parts [of the body] themselves. Nonetheless, nothing prevents some of them, at any rate, [from being separable,] because of being the actualizations of no body. Further, it is unclear whether the soul is the actualization of the body in the way a sailor is of a ship.

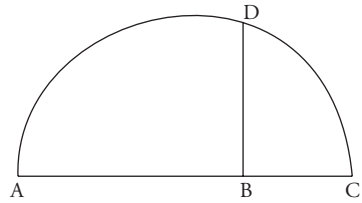
So much, then, by way of making determinations in outline and giving a sketch of the soul. 10

2.2
Second Definition of Soul

Since it is from what is non-perspicuous but more evident that what is perspicuous and better known in accord with its account comes about, one must in this way try again to approach the soul; for the defining account must not only make clear the that, which is what most definitions state, but must also include 15 the cause and make it evident. The accounts of definitions are like conclusions. For example, "What is squaring?" "It is making an equilateral rectangle equal to one that is not equilateral." But such a definition is an account of the conclusion, while the one that states that squaring is the finding of the mean states the cause of the thing.[24]

We say, then, to make a start to the inquiry, that what has soul is distinguished from 20 what lacks soul by living. But things are said to be living in many ways, and we say that a thing is alive even if only one of these is present—for example, understanding, perception, movement and rest with respect to place, further the movement involved

24. Euclid 2.14 shows how to construct a square (or equilateral rectangle) equal in area to a given non-equilateral rectangle. The figure below is the crucial one in the construction:



Here AB and BC are the sides of the given rectangle X. The square on BD is equal in area to X. Euclid 6.13 shows that AB : BD :: BD : BC, making BD the mean, which explains why the square on BD is equal in area to X.

in nourishment, and also both withering and growth. That is why all plants also seem to be alive; for they manifestly have within themselves a capacity and starting-point of this sort, through which they come to grow and decay in contrary directions; for they do not grow upward without growing downward, but grow in both directions alike, indeed in all directions, if they are nourished and continue to live through to the end, as long as they are capable of taking in nourishment.

This [capacity] can be separated from the others, but in the case of mortal beings the others cannot be separated from it. This is evident in the case of plants; for they have no other capacity of soul. It is due to this starting-point, then, that life belongs to all living things, while being an animal is due primarily to perception; for even what does not move or change its place, but which does have perception, is said to be an animal and not just a living thing. The primary sort of perception that belongs to all animals is touch. And just as the nutritive can be separated from touch and every perceptual modality, in the same way touch can be separated from the other perceptual modalities.

The nutritive, we say, is that part of the soul in which even plants share, while all animals manifestly have the perceptual modality of touch. The cause due to which each of these circumstances obtains, we will state later on.[25] For now, though, let this much alone be stated, that the soul is the starting-point of the things mentioned and is defined by these, by the capacities of nourishment, perception, thought, and movement.

But is each of these a soul or a part of a soul, and if a part, is it separable only in account or also in place? Regarding some of them, the answer is not difficult to see, while others involve puzzlement. For just as in the case of plants some manifestly live when divided and [the parts] are separated from each other, since the soul in them is actually one in each plant, but potentially many, in the same way we see this happening with other different sorts of soul in the case of insects that have been cut up; for each part has both perception and movement with respect to place—and if perception, then imagination and desire as well; for where there is perception, there is also both pain and pleasure, and where these, of necessity appetite too. But as regards the understanding and the contemplative capacity, nothing is yet evident, but it seems to be a distinct kind of soul, and it alone seems to admit of being separated, in just the way in which what is eternal is separated from what is capable of passing away.

It is evident from the foregoing considerations, however, that the remaining parts of the soul are not separable, as some people claim;[26] but that they are distinct in account is evident; for the perceptual part and the believing part are distinct, if indeed perceiving and believing are, and similarly for each of the others mentioned.

Further, all of these belong to some animals, some to some, and only one to others, and this produces differences among the animals. What cause this is due to,

25. 434a23–30, b9–24.
26. Plato, *Timaeus* 69c–70e.

must be investigated later on.[27] The situation is much the same as with the [different sorts of] perception; for some animals have them all, others some, others only the one that is most necessary: touch. **414ᵃ1**

Since something is said to be that by which we live or perceive in two ways, as is that by which we know scientifically (for in one way this is scientific knowledge, in another it is the soul, for we say that we know scientifically by each of these), and similarly something is said to be that by which we are healthy [in two ways], in one way by health and in another by a part or even by the whole of the body, and of these scientific knowledge and health are shape and a sort of form or account, and, as it were, activity of the recipient, in the one case of what is capable of scientific knowledge, in the other of what is capable of healing (for the activity of those things that are capable of acting on something seems to occur in that which is affected and suitably disposed), and since the soul is that by which we primarily live, perceive, and think, the result is that it will be a sort of account and a form, and not matter and the underlying subject. For something is said to be a substance, as we said,[28] in three ways, as form, as matter, and as what is composed of both. And of these, the matter is potentiality, while the form is actuality. And since what is composed of the two is an animate thing, it is not the body that is the actualization of the soul, but the soul is the actualization of a certain sort of body.

And that is why those people take things correctly who believe that the soul neither exists without a body nor is a body of some sort; for it is not a body, but it belongs to a body, and for this reason it is present in a body, and in a body of such-and-such a sort—and not as our predecessors supposed, when they inserted it into a body without first determining in which and in what sort, even though not just any random thing appears to be receptive of any random thing. In our way of looking at it, by contrast, it also comes about in accord with reason; for the actualization of each thing naturally comes about in what it already belongs to potentially, that is, in its proper matter.

That the soul, then, is a certain sort of actualization and account of what has the potentiality to be of this sort, is evident from these things.

2.3
The Capacities of Soul

Among the capacities of the soul mentioned, some living things have all of them, as we said,[29] others some of them, and some only one. The capacities mentioned were of nourishment, desiring, perception, movement with respect to place, and thought. To plants only the capacity of nourishment belongs, while to others it belongs together

27. 3.12–13.
28. 412ᵃ7–9.
29. 413ᵇ14–414ᵃ5.

414b1 with the perceptual capacity. But if the perceptual capacity, then so does the desiring one; for desire comprises appetite, spirit, and wish; all animals have at least one sort of perception: touch; but for what has perception there is also pleasure and pain, and the pleasant as well as the painful; and where there are these, there is also appetite; for it is a desire for the pleasant.

Further, animals have a perception of what is nourishing, for touch is a perception of what is nourishing; for all animals are nourished by dry, hot, wet, and cold things, of which the perception is touch. But touch is the perception of the other perceptible objects coincidentally. For neither sound nor color nor odor contribute anything to nourishment, while flavor is one of the tangible objects. Hunger and thirst are appetite—hunger being for dry and hot, thirst for cold and wet. Flavor is a sort of seasoning of these. These must be spoken about perspicuously later on.[30] For now, though, let this much be stated, that to those living things that have touch desire belongs too. But with imagination it is unclear, and must be investigated later on.[31]

Some have in addition to these the capacity of movement with respect to place, while others also have the thinking capacity and also understanding—for example, human beings and anything else there may be that is similar or more estimable.[32]

It is clear, then, that there could be a single account of soul in the same way as there is of figure; for in the latter case there is no figure beyond the triangle and the others that are next in order, and in the former there is no soul beyond the ones mentioned. But, even in the case of the figures, there could be a common account, which will fit all of them, but it will not be special to any figure. Likewise too in the case of the souls mentioned. That is why it is ridiculous to inquire after a common account both in these cases and in others, when it is an account that will not be special to any being, and will not be in accord with its proper indivisible form, to the neglect of the one that is of this sort.

For the situation as regards the soul is much the same as the one concerning the figures; for it is always in what is next in order that what is prior is potentially present, both in the case of figures and in the case of animate things—for example, the triangle in the quadrilateral, and the nutritive capacity in the perceptual one. So one must inquire as regards each given case what the soul of each given one is—for example, what that of a plant is and what that of a human or of a beast.

415a1 And what the cause is due to which they have this order must be investigated. For without the nutritive capacity there is no perceptual one, though the nutritive is separated from the perceptual one in the case of plants. Again, without touch none of the other sorts of perception is present, while touch is present without the others; for many animals have neither sight nor hearing nor perception of odors. And of the ones that can perceive, some have the capacity of movement with respect to

30. 2.10–11.
31. 3.3, 434a1–21.
32. *Cael.* 292a14–22, *NE* 1141a34–b2.

place, while others do not. Finally, and most rarely, they have rational calculation and thought; for among the ones capable of passing away, those that have rational calculation also have all the rest, while of those that have each of the others, not all have rational calculation; on the contrary, some do not even have imagination, while others live by it alone. And concerning the theoretical understanding a distinct account is required.[33]

It is clear, then, that the account concerned with each of these parts is the most appropriate in the case of a soul too.

2.4
The Nutritive Capacity

It is necessary for the one who is going to make an investigation into these capacities to grasp what each of them is, and in this way inquire about the things that follow, and about the others.[34] But if one has to say what each of them is—for example, what the capacity of understanding is, or of perception, or of nourishment—one must further say first what understanding is and what perceiving is; for activities and actions are prior in account to capacities. And if that is so, and further, if prior to them one must get a theoretical grasp on the corresponding objects, then one must, due to same cause, make some determinations about these—for example, about nourishment and perceptible and intelligible objects.

So one must first speak about nourishment and generation; for the nutritive soul belongs to the others as well [as to plants], and it is the first and most common capacity of soul, in virtue of which life belongs to all [living beings], and whose works are generation and the making use of nourishment; for it is the most natural work in those living things that are complete and not deformed or spontaneously generated, to produce another like itself—an animal producing an animal, a plant a plant—in order that they may partake in the eternal and divine insofar as they can; for all desire **$415^{b}1$** that, and it is for the sake of it that they do whatever they do by nature. (But the for-the-sake-of-which is twofold—the purpose for which and the beneficiary for whom.) Since, then, they cannot share in what is eternal and divine by continuous existence, because nothing that admits of passing away can persist as the same and numerically one, they share in it insofar as each can, some more and some less. And what persists is not the thing itself but something like itself, not one in number but one in form.

The soul of the living body is its cause and starting-point. But things are said to be these things in many ways, and the soul is likewise a cause in three of the ways distinguished; for the soul is a cause as that from which movement itself comes, as that-for-the-sake-of-which, and as the substance of animate bodies.

33. 3.4–7.
34. $402^{b}16$–$403^{a}3$.

That it is a cause as substance is clear; for the cause of being for every thing is its substance; living is the being for living things, and the soul is cause and starting-point of this. Further, the actuality is the account[35] of what is potentially. It is evident that the soul is also cause as that-for-the-sake-of-which; for just as the understanding does things for the sake of something, in the same way so does nature, and this is its end. And the soul is this sort of thing in animals in accord with nature; for all natural bodies are instruments of the soul, and just as those of animals are instruments, so too are those of plants, since they are for the sake of the soul. But there are two ways in which something is said to be the for-the-sake-of-which—the purpose for which and the beneficiary for whom. Also, that from which movement with respect to place first derives is soul too; but not all living things have this capacity. And alteration and growth are also in accord with soul; for perceiving seems to be a sort of alteration, and nothing perceives that does not partake of soul. It is the same way as regards growth and withering; for nothing either decays or grows naturally without being nourished, and nothing is nourished that does not have a share in life.

Empedocles did not speak correctly, however, when he added that growth comes about for plants in a downward direction when they root themselves because earth naturally moves spatially in that way, and in an upward direction because fire does likewise. For he does not grasp up and down correctly (for up and down are not the same for all things as they are for the universe,[36] but as the head is of animals, so the roots are of plants, if one must speak of instrumental parts as distinct or the same by appeal to their works). Besides, what is it that holds together the fire and the earth, since they are spatially moving in contrary directions? For they will be pulled apart, if there will be nothing to prevent it. But if there will be something, it is the soul—that is, the cause of growth and nourishment.

But some people think that it is the nature of fire to be the unconditional cause of nourishment and growth; for among the bodies or the elements, fire alone is manifestly something that is nourished and grows. That is why one might suppose that in both plants and animals it is this that does the work. But though it is in a way a contributing cause, it is certainly not an unconditional cause. On the contrary, it is rather the soul that is this; for the growth of fire is unlimited, as long as there is fuel, but there is a limit and an account of size and growth for things that are put together by nature; and these are characteristic of soul but not of fire, and of the account rather than of the matter.

Since the same capacity of the soul is nutritive and generative, one must first make some determinations also about nourishment; for it is distinguished from the other capacities by this work.

Nourishment seems to be a contrary for a contrary—not every contrary for every one, however, but wherever contraries not only come to be, but also grow, from each

35. I.e., the form.
36. *PA* 686ᵃ25–687ᵃ2.

other; for many things come to be from each other, but not all are quantities—for example, the healthy comes to be from the sick. And not even those that do grow from each other appear to nourish each other in the same way—for example, water is nourishment for fire, but fire does not nourish water. It seems, then, that it is especially among the simple bodies that one nourishes and the other is nourished.

But a puzzle arises; for while some people say that like is nourished by like, just as with growth, others think the reverse, as we said,[37] that it is a contrary for a contrary—the supposition being that like is unaffectable by like, while nourishment changes and gets concocted, and in every case change is into the opposite or into the intermediate. Further, the nourishment is affected by the thing being nourished, but not it by the nourishment, just as the carpenter is not affected by the matter, but it by him; the carpenter, for his part, merely changes to activity from inactivity.

But whether the nourishment is the final state of the thing added or the first makes a difference here. And if it is both, but one is unconcocted and the other concocted, it would be possible to speak of it as nourishment in both ways; for insofar as the nourishment is unconcocted, contrary is nourished by contrary, while insofar as it is concocted, like is nourished by like. So it is evident that both parties speak in a way correctly and in a way incorrectly.

But since nothing is nourished that does not partake in life, it is the animate body, insofar as it is animate, that will be what is nourished, so that nourishment is also relative to an animate being—and not coincidentally so. The being for nourishment, however, is distinct from the being for a growth-producer; for it is insofar as the animate thing has some quantity that a growth-producer exists for it, while it is insofar as it is a this something and a substance that nourishment does; for the animate thing preserves its substance and lasts just as long as it is nourished, and it is generative not of what is being nourished, but of something of the same sort as what is being nourished; for its own substance already exists, and nothing generates itself, but rather preserves itself. So this sort of starting-point of the soul is a capacity of the sort that preserves what has it, insofar as it is such, while nourishment equips it to be active. That is why, if deprived of nourishment, it cannot exist. And since there are three things, what is nourished, what it is nourished by, and what nourishes, what nourishes is the primary soul, what is nourished is the body that has it, and what it is nourished by is the nourishment. And since it is right to call everything after its end, and the end is to generate something of the same sort as itself, the primary soul will be one that can generate something of the same sort as itself. But what it is nourished by is twofold, just like what a ship is steered by, both the hand and the rudder—the one causing movement and being moved, the other being moved only. And it is necessary that all nourishment be capable of being concocted, and what effects the concoction is heat, which is why every animate thing has heat.

37. 416^{a}22–24.

What nourishment is has now been stated in outline. But it is necessary to speak perspicuously about this later on in the appropriate accounts.[38]

2.5
Perception

Now that these matters have been determined, let us speak about what is common to all perception.

Perception comes about in being moved and affected, as was said;[39] for it seems to be a sort of alteration. And some people say indeed that like is affected by like. In what way this is possible or impossible, we have said in our universal accounts concerning affecting and being affected.[40]

But a puzzle arises as to why perception of the perceptual modalities themselves does not also take place, and why they do not produce perception without external objects, though present in them are fire, earth, and the other elements, which are [the objects] of perception either intrinsically or of their coincidents.

It is clear, at all events, that the perceptual capacity is not actively, but only potentially so. That is why [it does not perceive without an external object], just as what is burnable does not burn all by itself without something to ignite it; for otherwise it would ignite itself, with no need of a fire existing in actuality. But since we speak of perceiving in two ways (for we say of what is potentially hearing or seeing that it sees or hears, even if it happens to be asleep, and also of what is actively doing so at the time), perception too will be spoken of in two ways—as potential, on the one hand, and as active, on the other. In the same way the perceptible object is also both the potential one and the active one.

First, then, let us speak on the supposition that being affected, being moved, and being active are the same; for, in fact, movement is a sort of activity, although an incomplete one, as was said elsewhere.[41] Everything is affected and moved [in way F] by an agent [F] that is also actively so. That is why, in one way, like is affected by like and, in another, by unlike, as we said;[42] for it is the unlike that is affected, but when it has been affected it is like.

Distinctions, however, must also be drawn concerning potentiality and actuality; for as things stand, we are speaking about them in a simple way. For one way that something can be a scientific knower is the way in which we would say that a human being is a scientific knower because the human being is among the scientific knowers and the ones that have scientific knowledge. Another way is that in which we say that

38. A reference to the lost *On Nourishment*.
39. 410a24–26.
40. *GC* 1.7.
41. *Met.* 1048b29–35.
42. 416a29–b9.

one who already has knowledge of grammar is a scientific knower. Each of these is capable, but not in the same way—the first, because his kind is of the requisite sort, and so is his matter, the other because he is capable of contemplating if he so wishes, and if nothing external prevents him. [In a third way,] there is the one who is already actively contemplating, the one who is actually and in the strict sense a scientific knower of this letter A. Both of the first two, then, are scientific knowers potentially, the one because of having been altered through learning, that is, by frequent changes from the contrary state, the other on the basis of having perception or scientific knowledge of grammar, but not activating it; he [changes] to activity in another way. **$417^{b}1$**

And being affected is not simple either. On the contrary, it is, on the one hand, a sort of destruction of something by its contrary, while, on the other, it is rather the preservation of what is potentially [F] by what is actually [F], and which is like it in the way that a potentiality is like an actuality; for an actual contemplator is what a possessor of scientific knowledge becomes, which is either not precisely an alteration (for the progress of the thing is into itself or into actuality), or else is a distinct kind of alteration. That is why it is not correct to say that what thinks, when it is thinking, is altered, just as it is not correct to say that the builder is altered when he builds. The bringing to actuality, then, of what understands and thinks from doing so potentially should rightly be called not "teaching" but some other name. And a person who learns and acquires scientific knowledge, proceeding from being [a scientific knower] potentially by the agency of one who is actually [a scientific knower], must not be said to be affected, as was said,[43] or else there are two ways of being altered, one a change to conditions of privation, the other to the positive states and the nature [of the thing].

The first change in a perceiver is brought about by the parent, and when it has been born it already has perception, just as it does scientific knowledge. And something is similarly said to be actively perceiving and contemplating. There is the difference, though, that in perception the things productive of the activity are external: what is visible, what is audible, and similarly for the rest of the perceptible objects. The cause of this is that active perception is of particulars, while scientific knowledge is of universals, and these are in a way in the soul itself. That is why it is up to oneself to understand whenever one wishes to, while it is not up to oneself to perceive; for it is necessary that the perceptible object be present. The same holds of the sciences that deal with perceptible objects, and due to the same cause, that perceptible objects are particular and external.

But about these matters there may be an opportunity to speak perspicuously later on.[44] For now, though, let it be enough to have determined this much, that what is said to be potential [or capable] is not simple, but rather while there is what is so in the way we would say that a boy is capable of being a general, there is also what is

43. $417^{a}32–^{b}2$.

44. If the reference is to the way in which contemplation is up to us, it may be to 3.4–5; if it is to the sciences dealing with perceptual particulars, it may be to 3.7, 3.10.

so in the way that a man of the right age is capable of being one, and it is the same way with what is capable of perceiving. But since there is no name for the difference
418a1 between these, although it has been determined about them that they are distinct and in what way they are distinct, it is necessary to use "being affected" and "being altered" as if these names had their prevalent meaning.

What is capable of perceiving is potentially such as the perceptible object already is actually, as was said.[45] It is affected, then, as being not like the object, but when it
5 has been affected it is made like it, and is such as the object is.

2.6
Perceptible Objects

It is necessary to speak first about the perceptible objects of each given perceptual modality. Things are said to be perceptible objects in three ways. Of these, we say that
10 we perceive two intrinsically, and one coincidentally. And of the two, one is special to a given perceptual modality, the other common to all.

By a "special object" I mean whatever cannot be perceived by another perceptual modality, and which we cannot be deceived about—for example, sight is of color, hearing of sound, taste of flavor, while touch has several different ones. At any rate,
15 a given perceptual modality discerns these, and does not make errors about whether there is color or whether there is sound, but rather about what the colored thing is or where it is, or what the thing making the sound is or where it is. Things like these, then, are said to be special objects of a given perception, while those that are said to be common are movement, rest, number, shape, and size; for things like these are special to no perceptual modality but common to all. For a sort of movement is perceived both by touch and by sight.

20 A thing is said to be coincidentally perceptible—for example, suppose the pale thing were the son of Diares; for one perceives this coincidentally, because it is coincident with the pale thing, which one perceives [intrinsically]. And that is why one is not affected at all by the perceptible object insofar as it is of this sort.

Among the intrinsically perceptible things, it is the special objects that are perceptible in the strict sense, and it is to these that the substance of each given perceptual
25 modality is by nature related.

2.7
Sight and Its Objects

That of which there is sight, then, is visible. And what is visible is, on the one hand, color and, on the other, what may be stated in an account, but happens to have no

45. 417a17–22.

name. What we mean will be quite clear as we proceed. For what is visible is color, and it is what is on [the surface of] what is intrinsically visible—intrinsically visible not in account, but because it has within itself the cause of its being visible. And every color is capable of causing movement in what is actively transparent, and this is its **418ᵇ1** nature. That is precisely why it is not visible without light, but rather each color is always seen in light. That is why one must first say what light is.

There is, then, something transparent. And by "transparent" I mean what, though visible, is not intrinsically visible, simply speaking, but rather visible because of the color of something else. Air, water, and many solid bodies are of this sort; for it is not insofar as something is water or insofar as it is air that it is transparent, but because there is a certain nature in it that is the same in both of them and in the eternal body above. And light is the activity of this, of the transparent insofar as it is transparent. And in whatever it is present in, there is potentially also darkness. For light is a sort of color of the transparent, when it is made actually transparent by fire or something of that sort, such as the body above; for something[46] that is one and the same also belongs to it.

What the transparent is, then, and what light is has been stated, that it is not fire nor a body at all, nor an effluence from any body (for it would also be a body in that case), but rather the presence of fire or something of that sort in the transparent; for in addition to its not being possible for there to be two bodies in the same place at the same time, light also seems to be the contrary of dark. But dark is the privation of this sort of state from the transparent, so it is clear again that the presence of it is light.

And so Empedocles is not correct,[47] and nor is anyone else who spoke in this way of light as traveling and extending for a time between the earth and what surrounds it, without our noticing it; for this is contrary not only to what argument makes clear but also to what appears to be so; for over a short distance this might escape our notice, but that it should escape notice all the way from east to west is too much to ask.

It is the colorless that is receptive of color, and the soundless of sound. And the transparent is colorless, and so is the invisible or the scarcely visible—as, for example, the dark seems to be. The transparent is of this sort not when it is actually transparent, but rather when it is potentially so; for the same nature is sometimes darkness and sometimes light.

Not everything is visible in light, but only the color proper to a given thing; for **419ᵃ1** some things are not seen in the light but instead produce perception in the dark—for example, things that appear fiery and shining (there is no one name for them), such as a snuffed wick,[48] horn, and the heads, scales, and eyes of fish. The color special to none of these is seen. The cause due to which these are seen is a subject for another

46. I.e., luminosity.
47. *Sens*. 6.
48. Or possibly a phosphorescent tree fungus (also *mukês*).

account.[49] But for now this much is evident, that what is seen in light is color. This is also why it is not seen without light; for this, as we saw,[50] is what the being is for color, being capable of causing a movement of what is actively transparent; and the activity of the transparent is light. A manifest sign of this is that if one places what has color upon the organ of sight itself, it will not be seen. Instead, the color causes the transparent—for example, the air—to move, and due to this, when the transparent is continuous, the perceptual organ is moved.

For Democritus did not speak correctly about this in supposing that if the intermediate space became a void, an ant would be seen in exact detail even if it were up in the heaven; for this is impossible. For seeing comes about when the part that can perceive is affected in a certain way. But it cannot be affected by the color that is being seen [since it is at a distance]. It remains, then, for it to be affected by what is intermediate, so that there must be something intermediate. If the intermediate space became a void, it is not that things would be seen in exact detail, but rather nothing would be seen at all.

The cause, then, due to which it is necessary for color to be seen in the light has been stated. But fire is seen in both, both in darkness and light, and this is of necessity so; for it is due to this that the transparent becomes transparent.

The same account applies to both sound and odor; for none of these produces perception when it touches the perceptual organ. Instead, due to odor and sound, what is intermediate is moved, and, due to this, each of the perceptual organs. And when one places what makes a sound or has an odor on the perceptual organ, it will produce no perception whatever. The same applies to touch and taste, though it does not appear to. The cause due to which this is so will be clear later on.[51] The medium for sounds is air, for odor something nameless; for there is indeed an affection common to air and water, and as the transparent is to color so this affection, which belongs to both of these, is to what has odor; for aquatic animals also appear to have a perception of odor. But human beings and footed animals that breathe cannot smell without breathing. The cause of these things too will be stated later on.[52]

2.8
Hearing and Its Objects

Now, though, let us first make some determinations about sound and hearing. Sound is twofold; for one is an active sort, the other potential; for we say that some things do not have a sound, for example, sponge or wool, while others do, for example,

49. Aristotle also refers to the phenomenon of phosphorescence at *Sens*. 437b5–7, but his extant treatises contain no account of it.
50. 418b1–2.
51. 422b34–423a2, 423b1–26.
52. 421b13–422a7.

bronze and things that are solid and smooth, because they are able to make sound—that is, to produce an active sound intermediate between themselves and the organ of hearing.

When a sound actively comes about, however, it is always of something, in relation to something, and in something; for a blow is what produces it. That is why indeed it is impossible for a sound to come about when there is [just] one thing; for the thing doing the striking and the thing being struck are distinct. So what makes a sound makes a sound in relation to something. But a blow does not come about without spatial movement, while, as we said,[53] a blow to any random thing is not a sound; for wool produces no sound if it is struck, while bronze does, and things that are smooth and hollow. Bronze does so because it is smooth, while hollow things, by reverberation, produce many blows after the first, because what is moved[, the air inside,] is unable to escape.

Further, sound is heard in air, and in water, although less so. It is not the air or the water that is in control of sound, however, but rather there must be a blow by solid things to each other and to the air. And this happens when air remains after being struck and is not dispersed. That is why if it is struck rapidly and forcefully, it makes a sound; for the movement of the one doing the striking must be too rapid for the air to disperse, just as if someone were to strike a blow to a heap—or rather a whirl—of sand that is in rapid movement.

An echo, on the other hand, comes about whenever, air having become one because a container delimits it and prevents it from being dispersed, the air [outside] is made to bounce back [from it] like a ball. And it seems likely that an echo always comes about, although not a perspicuous one, since what happens in the case of sound is surely just like what happens also in the case of light; for light, in fact, is always reflected (for otherwise there would not be light everywhere, but instead there would be darkness outside the sunlit area), although it is not reflected as it is from water or bronze or anything else that is smooth, so as to produce a shadow, by which we define the light.

What is void is correctly said to be in control of hearing. For the air seems to be a void, and it is this that produces hearing, when it is moved as one continuous thing. But because of its loose texture it does not resound unless what is struck is smooth. And then at the same time it becomes one because of the surface; for the surface of a smooth object is one.

What has a sound, then, is what can cause a movement in air that is one by continuity and that reaches up to [the organ of] hearing. But air is naturally conjoined with the organ of hearing; and because this organ is in air, when the air outside is moved, the air inside is moved. That is why the animal does not hear in every part of it, nor does the air enter every part; for the part that is going to be moved and is animate does not have air everywhere.

53. 419^{b}5–7.

The air alone, then, is soundless because it is easily dispersed; but when it is prevented from being dispersed, its movement is sound. But the air inside the ears has been walled in so as to be unmoving in order that it may perceive in exact detail all the differences in the movement. That is why we hear also in water, because the water does not enter the naturally conjoined air itself. On the contrary, it does not even enter the ear itself, because of the spiral shape. When this does happen, there is no hearing. Nor is there hearing if the eardrum is injured, just as with the cornea of the eye when it is outworn. But it is also a sign of whether there is hearing or not the ear always having an echo, like a horn; for then the air that is in the ears is always moving with a movement that is properly its own. But the sound is alien and not its own. And that is why people say that we hear with what is void and echoing, because we hear with what has the air confined [within it].

Is it what is struck or what does the striking that makes a sound? Or is it in fact both, albeit in distinct ways? For sound is the movement of something that can be moved in the way in which things bounce back from a smooth surface when someone strikes it. Not everything, then, as was said,[54] makes a sound when it is struck or does the striking—for example, if a needle strikes against a needle. On the contrary, what is struck must be even, so that the air may as a single mass bounce back and vibrate.

The differences in things that make sounds are made clear in the sound when it is active; for just as without light colors are not seen, so too without sound the sharp and the dull [are not heard]. Sounds are said to be these, however, by transference from tangible objects; for the sharp moves the perceptual modality a lot in a little time, while the dull moves it a little in a lot of time. Not, of course, that the sharp is rapid and the dull slow, but rather that in the one case, because of the rapidity, the movement comes to be of such a character, and in the other, because of the slowness. **420b1** And it seems that there is some analogy with the sharp and dull in touch; for the sharp, as it were, stabs, while the dull, as it were, pushes, because the one causes movement in a little time, the other in much time, so that it comes about that the one is rapid and the other slow.

About sound, then, let these be our determinations.

Voiced sound is a sort of sound belonging to something animate; for nothing inanimate has a voice, although such things may be said by similarity to have a voice—for example, the pipe, the lyre, and whatever other inanimate things have pitch-variation, melody, and speech. For there is a likeness because voiced sound also has these things. But many animals do not have a voice—for example, those that are bloodless and, among those that have blood, fish. And this is reasonable, if indeed sound is a sort of movement of air. But those fishes that are said to have a voice—for example, those in the Achelous[55]—make a sound with their gills or some other such

54. 419b13–14.
55. *HA* 535b14–18.

part. But voiced sound is sound characteristic of an animal, and not one made by any random part.

But since everything that makes a sound does so because something strikes, strikes something, and in something, and this last is air, it is reasonable that only those things that receive air have a voice. For nature uses what is already breathed in for two works—just as it uses the tongue both for tasting and for speech (of these, tasting is necessary, which is why it also belongs to more things, while communication is for the sake of well-being), so too it uses breath both for the internal heat as something necessary (the cause will be stated elsewhere),[56] and also for voice, so that well-being may be present.

The instrument for breathing is the larynx, and what this part is for the sake of is the lung; for it is due to this latter part that footed animals have more heat than others. And what is first to need the [effects of] breathing is in fact the region around the heart. That is why it is necessary that air should be breathed in and enter.

And so the blow struck on the so-called windpipe by the air that is breathed in, due to the soul in these parts, is voiced sound. For, as we said,[57] not every sound made by an animal is voiced sound (for it is possible both to make a sound with the tongue and as people do in coughing), but what does the striking must be animate, and must involve some sort of imagination. For voiced sound, of course, is a sort of sound that has signification, and is not, like a cough, the sound of the air that is breathed in. Instead, it is with this air that [the animal] strikes the air in the windpipe against the windpipe itself. A sign of this is not being able to use the voice when breathing in or breathing out, but [only] when holding one's breath; for the one holding his breath causes the movement with this. It is evident too why fish are voiceless; for they have no larynx. And they do not have this part because they do not receive air or breath in. The cause of this is for another account.[58]

2.9
Smell and Its Objects

About odor and the smellable it is less easy to make determinations than about the things already discussed; for it is not so clear what sort of thing odor is as it is with sound or color. The cause of this is that this perceptual modality, as we have it, is not exact but is inferior to that of many animals; for a human is a poor smeller and perceives none of the smellable objects unless they are painful or pleasant, because the perceptual organ is not exact. And it is reasonable to suppose that it is also in this way that the hard-eyed animals perceive colors, and that the differences among the colors

56. *Juv.* $474^{a}25$–$475^{b}19$.
57. $420^{b}10$–14.
58. *Juv.* $474^{b}25$–$476^{a}16$, *PA* $669^{a}2$–5.

are not clear to them except insofar as they cause or do not cause fear. And this is the way humankind is with regard to odors.

It would seem, indeed, that while smell is analogous to taste, and similarly the forms of flavor to those of odor, human taste is more exact because it is a sort of touch, and this perceptual modality is most exact in the human being; for in the others he is inferior to many animals, but in touch he is much more exceedingly exact than the rest. That is why it is also the wisest of the animals. A sign of this is that within humankind too being naturally well-disposed or naturally ill-disposed depends on this perceptual organ and on no other; for the hard-fleshed ones are naturally ill-disposed for thought, while the soft-fleshed ones are naturally well-disposed. And just as flavors are sweet or bitter, so too are odors. But some things have an odor and flavor that are analogous, I mean, for example, a sweet odor and a sweet taste, while others have ones that are contrary. In the same way an odor may also be pungent, harsh, sharp, or oily. But, as we said,[59] because odors are not very distinguishable in the way that flavors are, they have taken their names from the latter in accord with a likeness in the things; for sweet odor is from saffron or honey, while pungent odor is from thyme, and the same way in the other cases.

Smell is just like hearing and each of the perceptual modalities in that as hearing is of the audible and the inaudible, and sight of the visible and the invisible, so smell is of what is smellable and what is not smellable. And the smellable comprises what cannot possibly have an odor at all and what has little or faint odor. It is the same way with what is said to be tasteless.

Also, smell comes about through a medium—for example, air or water; for aquatic animals also seem to perceive odor, regardless of whether they have blood or are bloodless, as do those that live in air. And in fact some of them come from a great distance to get their nourishment, guided by odor.

That is why there appears to be a puzzle if, on the one hand, all animals smell in the same way, while, on the other hand, the human being smells when inhaling, and when, instead of inhaling he is exhaling or holding his breath, does not smell (whether the object is distant or near, or even if it is placed on the inside of the nostril); also, if the fact that something placed on the perceptual organ itself is incapable of being perceived is common to all animals, but being incapable of perceiving [odor] without inhaling is special to human beings, as is clear to those who test it; it follows that bloodless animals, since they do not breathe, would have some other perceptual modality beyond those mentioned. But that is impossible, if indeed they perceive odor; for the perception of the smellable, both foul-smelling and sweet-smelling, is smelling. And further they appear to be destroyed as a result of the same strong odors as a human being is—for example, bitumen, sulfur, and the like. They must smell, then, but without inhaling.

59. 421a10–16.

It seems that in human beings this perceptual organ differs from that in the other animals, just as their eyes do from those of hard-eyed animals; for our eyes have eyelids as a protection and a sort of sheath, and if we do not move and open these, we do not see. But hard-eyed animals have nothing of this sort, but see immediately whatever comes about in the transparent. In the same way, then, in some animals the perceptual organ of smell is uncovered, like the eye, while in those that receive air it has a covering, which is removed when they inhale, by dilation of the veins and ducts. And that is why animals that breathe do not smell in water; for it is necessary for them to have inhaled in order to smell, and it is impossible to do this in water. And odor belongs to what is dry, just as flavor does to what is wet, and the perceptual organ of smell is potentially like that.

2.10
Taste and Its Objects

The tasteable is a sort of tangible thing. And that is the cause of its not being perceptible through the medium of a foreign body; for touch [does not perceive that way] either. Also, the body in which the flavor is present—the tasteable—is in what is wet as matter. And this is a sort of tangible thing. That is why, even if we lived in water, if something sweet were thrown in, we would perceive it. But our perception of it would not be through a medium, but would be due to the mixture of it with the wet, as in the case of a drink. Color, by contrast, is not seen in this way, by its being mixed in, nor by effluences. There is nothing, then, serving as medium. And as color is the visible, so flavor is the tasteable. And nothing produces a perception of flavor without wetness, but either actively or potentially it has wetness—for example, the salty; for it dissolves easily and liquefies on the tongue.

Just as sight is of the visible and the invisible (for darkness is invisible but sight also discerns this), and further, of the excessively bright (for this is also invisible, but in another way from darkness), so too hearing is both of sound and silence, of which one is audible and the other inaudible, and of very loud sound as sight is of brightness (for just as a faint sound is inaudible so in a way is a loud or violent one), and as one thing is said to be entirely invisible (as with other cases of impossibility), while another is said to be so if it is natural for it to be visible but it is not visible or slightly visible (just as with the footless and the kernel-less)—so too in that way, then, taste is both of the tasteable and the tasteless, the latter being what has little flavor or slight flavor or is destructive of taste. The drinkable and the undrinkable seem to be a starting-point (for of both there is a sort of taste, in the one case of what is bad and destructive of taste, in the other of what is in accord with nature) and the drinkable is an object common to touch and taste.

But since the tasteable is wet, it is also necessary for its perceptual organ to be neither actually wet nor incapable of being wetted. For taste is affected in some way

by the tasteable, insofar as it is tasteable. What is necessary, therefore, is the wetting of something that is capable of being wetted while being preserved, but which is not itself wet—and this is the perceptual organ of taste. A sign of this is the fact that, when it is very dry, the tongue does not perceive anything nor does it do so when it is very wet; for in the latter case, the tongue becomes wet through the contact with the wetness that is there first, as when someone who has first tasted a strong flavor tastes another, and as to sick people all things seem bitter because they perceive them with a tongue full of bitter wetness.

The forms of flavor, as in the case of colors, are contraries when simple: the sweet and the bitter.[60] And next to the sweet is the oily and to the bitter the salty, and intermediate between these come the pungent, the harsh, the astringent, and the sharp. These seem to be pretty much all the differences in flavor. So what is capable of tasting something is potentially such, while the tasteable is what is capable of making it actually such.

2.11
Touch and Its Objects

As regards the tangible and touch, the same account applies; for if touch is not one perceptual modality but more than one, then the objects that are perceptible by being tangible must also be of more than one sort. But there is a puzzle about whether it is more than one or one, and about what the perceptual organ of the capacity of touch is, whether it is flesh, and what is analogous to this in other beings, or whether it is not, but instead this is the medium, while the primary perceptual organ is something else that is internal. For every perceptual modality seems to deal with one sort of contrariety—for example, sight with white and black, hearing with high and low pitch, and taste with bitter and sweet. But in the tangible there are many sorts of contrariety—hot cold, dry wet, hard soft, and whatever others are of this sort.

But there is a sort of resolution, at any rate, to this puzzle, that with the other perceptual modalities too there is more than one sort of contrariety—for example, in voiced sound there is not only high and low pitch, but also loudness and softness, smoothness and roughness of voice, and others of this sort. And there are other differences of this sort also in the case of color. But what the one thing is that is the underlying subject for touch in the way that sound is for hearing is not clear.

As to the question of whether the perceptual organ is internal or not, but is instead **423a1** immediately the flesh, it seems to be no sign of this that the perception comes about at the same time as contact does. For even as things stand, if one were to make a sort of membrane and stretch it around the flesh, this would immediately on being touched report the perception in the same way. And yet it is clear that the perceptual

60. *Sens.* 442a12–13.

organ is not in this membrane. And if it were in fact to become naturally conjoined [with the flesh], the perception would pass through even more quickly. That is why this sort of part of the body seems to have the same character as air would have if it were naturally conjoined with us all around; for then we would have seemed to perceive sound, color, and odor with one thing, and sight, hearing, and smell to be one perceptual modality. But as things stand, because what the movements pass through is discontinuous with us, it is evident that the perceptual organs that were mentioned are distinct.

But in the case of touch, as things stand, this is unclear; for the animate body cannot be composed of air or water; for it must be something solid. It remains, then, for it to be mixed from earth as well as from these, as flesh and what is analogous to it tend to be. So it is necessary for the body too to be the naturally attached medium for the capacity of touch, through which the perceptual modalities—though more than one—do operate. That they are of more than one sort is made clear by touch in the case of the tongue; for it perceives all tangible objects with the same part as it does flavors. If, then, the rest of our flesh also perceived flavor, taste and touch would have seemed to be one and the same perceptual modality. But as things stand they are two, because they are not interchangeable.

But someone might raise the following puzzle. If every body has depth, and this is the third dimension, and if intermediate between two bodies there is a third body, then it is not possible for the two to touch each other. But what is wet is not without body, neither is what is wet on the surface, but it must either be water or contain water. And things that touch each other in water, since their extremities are not dry, must have water intermediate between them, with which their extremities are flooded. But if this is true, then it is impossible for one thing to touch another in water. And it is the same way in air too (for air stands to the things in air as water does to the things in water, but this more escapes our notice, just as it more escapes the notice of aquatic animals whether the things that touch each other are wet). The question is, then, whether the perception of all objects comes about in **423^{b}1** the same way, or that of distinct things in distinct ways, just as it now seems that taste and touch perceive by touching, while the other perceptual modalities do so from a distance.

But this is not the case. On the contrary, we perceive even what is hard and what is soft through other things, just as we do what is productive of sound, what is visible, and what is smellable. But the latter are further away, the former close at hand, which is why it escapes our notice, since we do indeed perceive all things through a medium, but in these cases it escapes our notice. And yet, as we also said previously,[61] even if we perceived all the tangible objects through a membrane without noticing that it intervened, we would be in the same position as we now are in water and in air; for it seems to us now that we touch the things themselves and nothing through a medium.

61. 423^{a}2–5.

But there the tangible differs from what is visible and what can produce a sound, in that we perceive the latter because the medium acts on us in some way, while we perceive what is tangible not as a result of the medium but rather at the same time as the medium, like a man who is struck a blow through his shield; for it is not that the shield having been first struck then strikes the man a blow, but rather what happens is that both are struck at the same time.

In general, then, it seems that as air and water are to sight, hearing, and smell, so the flesh and the tongue are to their perceptual organ as each of these is. And when the perceptual organ itself is touched, neither in the one case nor in the other can perception take place—for example, if someone were to place a white body on the surface of the eye. From which it is also clear that what can perceive the tangible is internal. For it would be precisely like what happens in the case of the other perceptual modalities; for things placed on the perceptual organ are not perceived, but what is placed on the flesh is perceived; so the flesh is the medium of what can perceive by touch.

It is the differences in body insofar as it is body that are tangible objects. I mean the differences that determine the elements, hot, cold, dry, and wet, about which we spoke previously in our account of the elements.[62] The perceptual organ for these, the one that can perceive by touch and in which the perceptual modality called "touch" primarily belongs, is the part that is potentially such as they are; for perceiving is a sort of being affected, and so what does the affecting makes that part such as it is actively, the part being such potentially. That is why we do not perceive what is equally as hot, cold, hard, or soft [as the perceptual part], but only the excesses, the perceptual modality being a sort of mean between the contraries in the perceptible objects. And that is why it discerns the perceptible objects. For the mean is capable of discerning; for in relation to each extreme it becomes the other. And just as what is to perceive white and black must be neither of them actively, although both potentially (and similarly too in the case of the other perceptual modalities), so in the case of touch it must be neither hot nor cold.

Further, just as sight, as we saw,[63] was of the visible and in a way of the invisible, and just as the rest of the perceptual modalities too were similarly of opposites, so touch is of the tangible and the intangible—where the intangible consists of what has to an altogether minor degree the differences present in tangible objects, as is the case with air, and of the excessive tangible things, such as those that are destructive [of the perceptual modality].

Each of the perceptual modalities has now been spoken about in outline.

62. *GC* 330ᵃ30–ᵇ7.
63. 422ᵃ20–21.

2.12
Perception as the Capacity to Receive Form without Matter

Speaking in universal terms about every perceptual modality, one must grasp that the perceptual modality is what can receive the perceptible forms without the matter, as wax receives the seal of the signet ring without the iron or the gold; it takes on a golden or brazen seal of a signet ring, but not insofar as it is gold or bronze. In the same way too the perceptual modality for each [sort of object] is affected by what has color, flavor, or sound, but not insofar as each is said to be [what it is], but insofar as it is of such-and-such a sort, and in accord with the ratio.[64] The primary perceptual organ is that in which a capacity of this sort exists. It is the same [as the capacity], but the being [for them] is distinct; for what does the perceiving would be a spatial magnitude; but surely neither the being for what is capable of perceiving nor the perceptual modality is a spatial magnitude, but rather a sort of ratio and capacity of that thing.

It is evident from this why exactly it is that the excesses in perceptible objects destroy the perceptual organs; for if the movement is too strong for the perceptual organ, the ratio is dissolved (and this, as we saw,[65] is the perceptual modality), just as the consonance and pitch [of a lyre] are if the strings are struck too forcefully.

And it is also evident why exactly it is that plants do not perceive, although they have a part that is soul and are affected by tangible objects; for in fact they are cooled and heated; for the cause of this is their not having a mean, nor a starting-point of a sort that can receive the forms of perceptible objects; on the contrary, they are affected [by these objects] along with the matter.

But someone might raise a puzzle as to whether what is incapable of smelling can be affected in any way by odor, or what is incapable of seeing by color, and similarly in the other cases. But if the smellable is odor, if it produces anything, it is smelling that odor produces. So none of those things that are incapable of smelling can be affected by odor (and the same account applies in the other cases), nor can any of the ones that are capable, except insofar as each is capable of perceiving [the relevant thing]. At the same time, this is also clear from the following. It is not light and dark or sound or odor that produces any effect on bodies, but rather it is the things in which these perceptible objects are present—for example, it is the air that accompanies the thunder that splits the wood. Tangible objects and flavors, on the other hand, do affect bodies. For otherwise what would inanimate things be affected and altered by? Will these other objects, then, produce some effect? Or is not every body affected by smell and sound, and are those that are affected indeterminate and such as not to remain where they are—for example, air (for air gives off odor as if it had been affected)? What then is smelling beyond

64. $426^{a}27–^{b}9$.
65. $424^{a}24–25$.

some sort of being affected? Or is smelling perceiving, while the air, when affected, quickly becomes perceptible?

BOOK 3

3.1
Why There Are No More Than Five Perceptual Modalities

That there is no perceptual modality beyond the five (I mean by these sight, hearing, smell, taste, and touch), anyone may be persuaded from the following considerations. For if even, as things stand, of everything for which touch is the perceptual modality we indeed have perception (for all the affections of the tangible insofar as it is tangible are perceptible to us by touch); and if indeed when we lack any perceptual modality we must also lack some perceptual organ; and if all the things that we perceive by touching them ourselves are perceptible by touch, which is a perceptual modality we in fact have, while all those we perceive through media without touching the things themselves we perceive by means of the simple bodies (I mean, for example, air and water); and if it is the case that more than one perceptible objects that are distinct in kind from each other are perceived through one [simple body], then a being possessed of a perceptual organ of this sort must be capable of perceiving both (for example, if the perceptual organ is composed of air, and air is the medium for both sound and color), while if there is more than one medium for the same perceptible object (for example, air and water for color, since both are transparent), then even a being possessed of [a perceptual organ composed of] only one of them will perceive whatever is perceptible through both; and if perceptual organs are composed of two of these simple bodies only, air and water (for the eye-jelly is composed of water, the organ of hearing of air, and the organ of smell of one or the other of these), while fire either belongs to none or is common to all (for nothing is capable of perceiving without heat), and earth either belongs to none or is most of all a constituent especially connected to touch; then it would follow that there is no perceptual organ outside those composed of water and air, and these some animals possess even as things stand, with the result that all the perceptual modalities are possessed by those animals that are not either incomplete or deformed (for it is evident that even the mole has eyes under its skin); so if there is not some other [simple] body or some affection possessed by none of the bodies that exist here, then no perceptual modality will be left out.

But neither, however, can there be some special perceptual organ for the common perceptibles, which we [then] perceive coincidentally by means of each perceptual modality—for example, movement, rest, shape, magnitude, number, and oneness;

for we perceive all these by movement (for example, magnitude by movement, and so also shape, for shape is a sort of magnitude, rest by non-movement, number by negation of continuity) and by the special objects (for each perceptual modality perceives one [of these]). So it is clear that it is impossible for there to be a special perceptual modality for any of these—for example, for movement; for in that case it would be the way it is now when by sight we perceive the sweet; and this we do because we happen to have perceptual modalities for both [color and sweetness], by which, when they occur together, we know them simultaneously; otherwise, we would perceive them in no other way than coincidentally—for example, [we perceive] the son of Cleon, not because he is the son of Cleon, but because he is pale, and this pale thing coincides with the son of Cleon. But for the common perceptibles we already have a perceptual capacity that is common, not coincidentally. There is, therefore, no special perceptual modality [for them]; for otherwise we would perceive them in no other way than in the way just mentioned that we see the son of Cleon.

The perceptual modalities, however, perceive each other's special objects coincidentally, not insofar as they are the perceptual modalities they are but insofar as they are one, whenever the perception comes about at the same time in relation to the same thing—for example, that bile is bitter and yellow (for it is certainly not for any *other* perceptual modality to state that both are one). That is also why we may be deceived, and if something is yellow, we may think that it is bile.

For the sake of what, one might inquire, do we have several perceptual modalities instead of only one? Or is it in order that the accompanying common perceptibles should less escape our notice—for example, movement, magnitude, and number? For if there was sight alone, and it was of white, they would more escape our notice, and all things would seem to be the same because of color and magnitude accompanying each other at the same time. But as things stand, since the common perceptibles belong in the objects of another perceptible capacity as well, this makes it clear that each of them is something distinct.

3.2
Perceiving That We Perceive; Relation of Perceptual Modalities to Their Objects; Distinguishing These Objects

Since we perceive that we see and hear, it must either be by sight that someone perceives that he sees or by another [perceptual capacity]. But then it will be the same one that perceives sight and the underlying color. So either there will be two modalities perceiving the same thing, or else one will perceive itself. Further, if the perceptual modality perceiving sight were indeed a distinct one, either they will go on without limit or there will be one that perceives itself. So one should grant this to the first perceptual modality.

But this involves a puzzle; for if to perceive by sight is to see, and what is seen is color or what has color, then if someone is to see the thing that sees, the primary thing that sees will also have color. It is evident, therefore, that to perceive by sight is not one thing; for even when we do not see, we discern darkness and light by sight, although not in the same way. Further, even the thing that sees is in a way colored; for each perceptual organ is receptive of the perceptible object without the matter. That is why, even when the perceptible objects are gone, perceptions and appearances remain in the perceptual organs.

The activity of the perceptible object and of the perceptual modality are one and the same (although the being for them is not the same). I mean, for example, the active sound and the active hearing; for it is possible to have hearing and not to hear, and what has a sound is not always making a sound. But when what can hear is active and what can make a sound is making a sound, then the active hearing comes about at the same **426ᵃ1** time as the active sound, and one might say that the one is a hearing and the other a making of a sound. If, then, the movement—that is, the making and the being affected—is in the thing being acted upon, then both the active sound and the active hearing must be in what is potentially hearing; for the activity of what produces and of what causes movement comes about in the thing that is affected. That is why it is not necessary for what moves something to be itself moved. The activity of what can make a sound, then, is a sound or a making of a sound, while that of what can hear is hearing or an act of hearing; for hearing is twofold, and sound is twofold.

The same account also applies to the other perceptual modalities and perceptible objects. For just as the acting and the being affected are in what is being affected and not in what is acting, so both the activity of the perceptible object and of the perceptual modality are in the perceptual modality. But in some cases they are named, for example, the making of a sound (*psophêsis*) and the act of hearing (*akousis*), while in other cases one or the other is nameless; for the activity of sight is said to be seeing (*horasis*), while that of color is nameless, and that of taste is tasting (*geusis*), while that of flavor is nameless.

Since there is one activity of the perceptible object and of the perceptual modality, although their being is not the same, it is necessary for hearing and sound that are said to be such in this [active] way to be destroyed and to be preserved together, and so also with flavor and tasting, and similarly with the others. But when these are said to be such potentially this is not necessary.

The earlier natural scientists, however, did not speak well about this, since they thought that there was neither white nor black without seeing, nor flavor without tasting. For though in one way they spoke correctly, in another way they spoke incorrectly; for since perception and the perceptible object are spoken of in a twofold way, on the one hand, as potential and, on the other, as active, what they said holds of the latter but not of the former. But they spoke in a simple way about things that are not spoken of in a simple way.

If, then, voice is a sort of consonance, and voice and hearing are in a way one (while in another way not one and the same), and if consonance is a ratio, hearing must also be a sort of ratio. And that is why each sort of excess, whether high or low pitch, also destroys hearing, and similarly excesses in flavor destroy taste, and in colors the intensely bright and dark destroy sight, and in smell the strong odors, whether sweet or bitter, since the perceptual modality is a sort of ratio. That is also why things are pleasant when, being pure and unmixed, they are brought into the ratio—for example, the sharp, sweet, or salty—for they are pleasant then. And in general a mixture is more a consonance than either high or low pitch are, and for touch what can be heated or cooled.[66] The perceptual modality is the ratio, and excessive things pain or destroy it.

Each perceptual modality, then, is of its underlying perceptible subject, is present in the perceptual organ insofar as it is a perceptual organ, and discerns the differences in the underlying perceptual subject—for example, white and black in the case of sight, sweet and bitter in that of taste. And similarly in the case of the others. But since we discern white and sweet and each of the perceptible objects in relation to each, it is by means of something that we also perceive that they are distinct. It is necessary, then, for it to be by perception; for they are perceptible objects. (From this it is clear too that flesh is not the ultimate organ of perception; for then it would be necessary for what discerns to discern by touching it.)

Nor indeed is it possible to discern by separate things that sweet is distinct from white, but both must be clear to some one thing—for otherwise, even if I perceived the one and you the other, it would be clear that they would be distinct from each other. Instead, one thing must state that they are distinct; for sweet is distinct from white. The same thing, therefore, states this; so that, as it states, so too it understands and perceives.

It is clear, then, that it is not possible to discern separate things by separate things—and not at separate times either, as is clear from the following. For just as the same thing states that good and bad are distinct, so also when it states that the one and the other are distinct, the "when" is not coincidental (by "coincidental" I mean, for example, when I say now that that they are distinct, but not that they are distinct now). Instead, it states now that they are that way now—at the same time, therefore. So it is something inseparable [into parts] and discerns in a time that is inseparable [into parts].

But surely it is impossible for the same thing to be moved with contrary movements at the same time, insofar as it is indivisible and in an indivisible time. For if something is sweet, it moves perception or understanding in one way, while what is bitter moves it in a contrary way, and what is white in a distinct way. Is, then, what discerns both indivisible in number and inseparable [into parts], while the being for

66. Reading ἀφῇ δὲ τὸ θερμαντὸν ἢ ψυκτόν. I.e., what is not already at one extreme or the other.

it is separated [into parts]?[67] Surely, it is in one way that what is divisible perceives divided [perceptible] things, but in another way it is this, insofar as it is indivisible, that does so; for the being for it is divisible, but in place and in number it is indivisible.

Or is this not possible? For although what is the same and indivisible admits of contraries potentially, the being for it does not, rather it becomes divided by being activated. And it cannot possibly be white and black at the same time, so that it cannot be affected at the same time by [taking on] the forms of these, if perceiving and understanding are the sorts of things described. On the contrary, it is like what they call a point, in the way that it is one and two, in this way it is [both indivisible] and divisible.[68] Insofar as it is indivisible, what discerns is one and discerns at one and the same time, but in the way in which divisibility belongs to it, it treats the same seal[69] in two ways at the same time. In the way, then, in which it treats the limit[70] as two things, it discerns two separate things, being itself in a way separated; but insofar as it is one, [it treats the limit as] one thing and at one and the same time.

Let the starting-point, then, in virtue of which we say that an animal is capable of perceiving, be determined in this way.

3.3
Imagination

There are two different features by which people most of all define the soul: movement with respect to place, on the one hand, and understanding, discerning, and perceiving, on the other. But both understanding and thinking seem like a sort of perceiving (for in both of these the soul discerns and knows one of the beings). Indeed, the ancients say that thinking and perceiving are the same. Empedocles, for example, said, "Cunning increases in men in relation to what is present to their perceptual modalities" and elsewhere "Hence they always find their thinking too presenting other things,"[71] and the same thing is meant by Homer's "Such is the mind of men";[72] for all of these people take understanding to be corporeal, like perceiving, and both perceiving and thinking to be of like by like, as we determined at the start of our accounts.[73]

427b1 And yet they should have spoken about error too at the same time; for it is something that more properly belongs to animals, and the soul spends more time in this condition. That is why it is necessary either, as some say,[74] that all appearances are

67. *Sens.* 449a5–16, *Somn.* 455a12–27.
68. *Ph.* 220a10–11, 222a10–20.
69. I.e., the form that is imprinted on the perceptual modality. See 424a18–19.
70. I.e., the point at which the two treatments of the seal are registered. Compare 431a17–b2.
71. B106, B108 DK (also *Met.* 1009b19–20).
72. *Odyssey* 18.136.
73. 404b7–405b19.
74. E.g., Democritus (404a27–31).

true, or that error consists in contact with the unlike; for this is contrary to knowing like by like; but both error and scientific knowledge seem to be the same with respect to contraries. That perceiving and thinking are not the same, then, is evident; for all animals have a share of the former, but few of the latter. Nor is understanding (in which there is what is correct and what is incorrect, where what is correct is wisdom, scientific knowledge, and true belief, and what is incorrect is the contrary of these) the same as perceiving. For the perception of the special perceptibles is always true, and belongs to all animals, while thinking admits also of being false, and belongs to no animal that does not also have reason. Imagination is indeed distinct from both perception and thought, and this itself does not come about without perception, and without it there is no supposition.

But it is also evident that imagination is not the same as supposition. For this affection is up to us [to have] whenever we wish (for it is possible to produce something before our eyes, as is done by those who put things in mnemonic systems and make a mental image of it), but believing is not up to us; for it is necessary that it either be done falsely or done truly. Further, when we believe that something is terrible or frightening, we are immediately affected in the corresponding way, and similarly if it is something reassuring. With imagination, by contrast, our state is just like that of people looking at terrible or reassuring things in pictures. (And of supposition itself there are also different sorts—scientific knowledge, belief, wisdom, and the contraries of these; but the difference between these is for another account.[75])

As regards understanding, since it is distinct from perceiving, and since it seems to be part imagination and part supposition, after having made determinations about the imagination, it is thus necessary to speak about the other. If, then, imagination (*phantasia*) is that in accord with which we say that some appearance (*phantasma*) comes about in us, and if we are not speaking metaphorically, is it some one of these: **428ᵃ1**
a capacity or state in accord with which we discern and grasp truth or falsity? And of this sort are perception, belief, scientific knowledge, and understanding.

That it is not perception is clear from the following. For while perception is either a capacity or an activity, such as sight and seeing, things can appear to us when neither of these is present—for example, the ones in dreams. Next, perception is always present but not imagination. And if they were the same in activity, it would be possible for all beasts to have imagination, but it seems not to be so—for example, in the case of ants, bees, or grubs. Next, perceptions are always true, while most appearances prove false. Next, we do not say, when we are activating [our perceptual modalities] in an exact way regarding a perceptible object, that it [merely] appears to us to be a human, but rather when we do not perceive it clearly, then it may be true or false.[76] And, precisely as we said previously, visible objects appear to us even when we have our eyes closed.

75. *APo*. 1.33, *NE* 6.3, 6.5.
76. Reading τότε ἢ ἀληθὴς ἢ ψευδής.

But then again neither will imagination be any of those things that always prove true—for example, scientific knowledge or understanding; for imagination can also be false.

It remains, then, to see whether it is belief; for there is both true and false belief. But conviction follows upon belief (for it is not possible to believe what we believe without being persuaded of it), and while none of the beasts has conviction, imagination is present in many. Further, every case of belief implies conviction, conviction implies being persuaded, and persuasion implies reason, and while some beasts have imagination, none has reason.

It is evident, therefore, that imagination will be neither belief together with perception, nor belief due to perception, nor a combination of belief and perception,[77] both because of the foregoing considerations and because it is clear that belief is about nothing other than that object, if it exists, which is also the perceptible object. I mean that it is the combination of a belief about the pale and a perception of the pale that constitutes imagination; for imagination is surely not constituted from a belief whose object is the good and a perception of the pale. To be appeared to [in **428b1** imagination], then, is to believe non-coincidentally precisely what one perceives. In fact, though, something can appear falsely, about which one has at the same time a true supposition. For example, the sun appears to be a foot across, although one is persuaded that it is bigger than the inhabited world. It follows [on the view we are considering], then, either that one has jettisoned the true belief one had, even though the thing has remained the same, and one has neither stopped noticing nor been persuaded to change, or else, if one still has the belief, it will be necessary for the same one to be true and false. But it could have become false only if the object changed without one's noticing. Therefore, imagination is not one of these things nor is it constituted from them.

But since, when something is moved a distinct thing can be moved by it, and since imagination seems to be a sort of movement and seems not to occur without perception, but rather to occur in things that perceive and to be of those things that perception is of, and since it is possible for movement to occur as a result of the activity of perception, which movement must be like the perception—this movement could neither be present without perception nor could it belong to non-perceiving things, and it is possible for what has it to do and be affected by many things in accord with it, and for it to be either true or false.

This happens due to the following: Perception of the special perceptibles is true or has the least possible degree of falsity. Second, perception is of the things coinciding with these, and here it is already possible for it to be in error; for about the fact that something is pale, perception cannot be false, but about whether this or something else is the pale thing, it can be false. Third, perception of the common perceptibles that follow along with the coinciding things, I mean, for example, movement and

77. Plato, *Timaeus* 52a, *Sophist* 264a, b.

magnitude, that coincide with the perceptibles. And about these now it is most of all possible to be in error in accord with perception.

But the movement that comes about as a result of the activity of perception, the one that results from these three sorts of perception, will be different. For the first is true as long as the perception is present, while the others may be false whether it is present or absent, and especially when the perceptible object is far away.

If, then, imagination has no characteristics other than the ones that were mentioned, but is what has been described, imagination will be a movement that comes about as a result of the activity of perception. And since sight is perception to the highest degree, imagination (*phantasia*) derives its name from light (*phaos*), because without light it is not possible to see. And because its objects persist and are similar to perceptions, animals do many things in accord with them, some because they lack understanding (for example, beasts) and others because their understanding is sometimes obscured by feelings, diseases, or sleep (for example, human beings).

As regards imagination, then, what it is and why it is, let this much be said.

3.4
Passive Understanding

Concerning the part of the soul by which the soul both knows and thinks, whether this is separable or whether it is not, indeed, separable as a spatial magnitude but only in account, it is necessary to investigate what its different sorts are, and how exactly understanding comes about.

If understanding were like perceiving, it would be either a sort of being affected by the intelligible object or something else of that sort. Therefore, it must be unaffectable but receptive of the form, and potentially such as the form is, although not the same as it, and as what is capable of perceiving is in relation to the perceptible objects, so the understanding must be in relation to the intelligible ones.

Therefore, it must, since it understands all things, be unmixed, as Anaxagoras says,[78] in order that it may master them—that is, in order that it may know them; for something alien intruding into it impedes and obstructs it. So too it has no other nature than this, that it is potentially. Therefore, the [part] of the soul that is called the "understanding" (and I mean by the "understanding" that by which the soul thinks and grasps things) is actively none of the beings before it [actively] understands them. That is why it not reasonable for it to have been mixed with the body; for it would then come to be of a certain sort, either cold or hot, or there would be some instrument for it, just as for what is capable of perceiving; but as things stand there is none. Those who say, then, that the soul is a place of forms speak well, except

78. B12 DK.

that it is not the whole soul, but what is capable of understanding, and it is not actually but potentially the forms.

That the ways in which what is capable of perceiving and what is capable of understanding are unaffectable are not the same is evident from the case of the perceptual organs and the perceptual modality. For the perceptual modality is not capable of perceiving after the perceptible object has been too intense—for example, it cannot perceive sound after hearing very loud sounds, nor see nor smell after very intense colors or odors. But when the understanding understands something intensely intelligible, it [afterward] understands inferior ones not less, but even more; for while what is capable of perceiving does not exist without a body, the understanding is separable. And when the understanding becomes each of the [intelligible] things in the way in which the one who is said to have active scientific knowledge does so (and this comes about when he is capable of activating it by himself), even then it exists potentially in a way, although not in the same way as before learning or discovering [these]—and then it is also capable of understanding itself.

But since magnitude is other than the being for magnitude, and water than the being for water (and so also for many other things, although not for all; for in some cases they are the same), one discerns the being for flesh and flesh [itself] by distinct things or by the same thing in distinct states; for flesh does not exist without matter, but, like the snub, is this in this.[79] It is by means of the perceptual capacity, then, that one discerns the hot and the cold, and those things of which flesh is a certain ratio. But it is by something else—either something separable or the way the state of a bent line is in relation to itself when straightened out—that one discerns the being for flesh. And, again, in the case of abstract beings the straight is like the snub; for it involves extension. But its essence, if the being for straight is distinct from the straight, is something else—let it be, twoness. Therefore, it is by means of a distinct thing that one discerns it, or by means of the same thing in a distinct state. In general, therefore, the way the things are separable from matter is the way it is too with what concerns the understanding.

But someone might raise a puzzle: if the understanding is something simple and unaffectable, and if it has nothing in common with anything, as Anaxagoras says, how will it understand, if to understand is to be affected in some way (for it is insofar as two things have something in common, that the one seems to affect and the other to be affected)? Further, is it itself also intelligible? For either understanding will belong to other things—if it itself is intelligible not in virtue of something else and if the intelligible is something that is one in form—or it will have something mixed with it that makes it intelligible in just the way other things are.

Or rather, [since] "being affected in virtue of something common" has been determined previously,[80] is it that the understanding is in a way the intelligible objects

79. *Met.* 1030b16–18, 1035b27–30, 1036b23–24.
80. 417b2–8.

potentially, although it is none actually before it [actively] understands [them]? It is potentially [these] in the same way as on a wax tablet on which nothing actually written **430ᵃ1**
is present; that is precisely how it is in the case of the understanding. And it is an intelligible object in just the way the intelligible objects are. For in the case of those things that have no matter, what understands and what is understood are the same; for theoretical scientific knowledge and what is scientifically known in that way are the same. (The 5
cause of the understanding's not always [actively] understanding must be investigated later on.[81]) In those that have matter, each of the intelligible objects is present potentially. So in these understanding will not be present (for the understanding is a capacity to be such things without the matter), but being an intelligible object will belong to it.

3.5
Productive Understanding

But since, just as in the whole of nature, there is something that is matter for each kind (and this is what is potentially all those things [that are in the kind]), while there 10
is something else that is causal and productive, because of producing them all (which, for example, is the role of craft in relation to the matter), in the soul too there must be these differences. And one sort of understanding exists by becoming all things, another sort by producing all things, as a sort of state, like light, does; for in a way 15
light too makes the beings that are potentially colors into active colors.

And this [productive] understanding is separable, unaffectable, and unmixed, being in substance an activity; for the producer is always more estimable than the thing affected, and the starting-point than the matter. Active scientific knowledge, for its part, is the same as its object, while potential scientific knowledge is prior in 20
time in the individual, but in general, is not even prior in time; on the contrary, [productive understanding] is not sometimes understanding and at other times not. But, when separated, it is alone precisely that which it is, and it alone is immortal and eternal (but we do not remember because this is unaffectable, while the passive understanding is capable of passing away), and without this nothing understands. 25

3.6
Simple and Complex Intelligible Objects

The active understanding of indivisible things is found in those cases concerning which there is no falsehood,[82] while in those in which there is both falsehood and truth, there is already some sort of composition of intelligible objects as if they were

81. 430ᵃ20–22.
82. *Met.* 1051ᵇ17–1052ᵃ11.

one—as Empedocles said, "as many heads sprouted without necks"[83] and were then combined by love—so too these things that were separate are combined (for example, the incommensurable and the diagonal); and if it is of things that have been or that will be, it understands and combines time in addition. For falsehood always involves composition; for even if [it understands] the pale thing not to be pale, it combines not-pale [with it]. (It is possible to say that all these are also cases of division.) But, at any rate, it is not only false or true that Cleon is pale, but also that he was or will be so. And what produces the one thing is in each case the understanding.

But since what is indivisible is twofold, either potentially so or actively so, nothing prevents someone from grasping what is indivisible when his understanding grasps a length (for this is actively indivisible), nor from doing so in an indivisible time; for the time is divisible and indivisible in a similar way to the length. It is not possible, then, to say what he is understanding in each half of the time; for [the part] does not exist before [the whole] gets divided, except potentially. But if he grasps each of the halves separately, then he also divides the time together with it, and then it is as if they were lengths. But if he grasps the length as composed of both halves, then he does so in the time composed of both halves; things that are indivisible, not with respect to quantity, but in form, he understands in an indivisible time and with an indivisible part of the soul. But coincidentally, and not in the way that those things are, the thing by which he understands and the time in which he understands are divisible, but in the way that those things are, indivisible.[84] For there is also something indivisible in these things, although presumably not separable, which makes the time and the length one. And this is likewise the case for everything that is continuous, both for time and for length.

A point, on the other hand, and every division, and whatever is in this way indivisible, is made clear in the way a privation is. And the same account applies to the other cases (for example, how one knows the bad or the black); for one knows them in a way by their contrary. But what knows must be potentially [the contrary] and in it [the contraries] must be one.[85] And if for something there is no contrary of its causes,[86] it knows itself and is actively and is separable.

A phrase,[87] however, is something [predicated] of something, as too is an affirmation, and each one is either true or false. But understanding is not like that in every case; on the contrary, that of the what-it-is in the sense of the essence is true, and is not something [predicated] of something. However, just as the seeing of a special object is true, but seeing whether the pale is a human or not is not always true, so it is also with [understanding] what is without matter.

83. B57 DK.
84. Reading ἀλλ᾽ ᾗ ἀδιαίρετα.
85. Reading ἕν εἶναι ἐν αὐτῷ.
86. *Met.* 1075b21–23.
87. *Int.* 16b26–31.

3.7
Active and Potential Scientific Knowledge

Active scientific knowledge is the same as its object; but potential scientific knowledge is prior in time in the individual, but in general, is not even prior in time; for all things that come to be do so from what actually is. And it is evident that from the perceptual capacity, which is potentially [perceiving], the perceptible object produces active [perception]; for it is not affected or altered.[88] That is why this is another form of movement; for movement [proper] is the activity of what is incomplete, while an activity in the strict sense—the activity of what is complete—is something else. Perceiving, then, is like mere phrasing and understanding,[89] but when [the perceived object] is pleasant or painful, [the soul], as if affirming or denying, pursues or avoids; and to feel pleasure or pain is to be active with regard to the perceptual mean in relation to what is good or bad, insofar as they are such. Both aversion and desire, when activated, are the same, and the desiring capacity and the aversive capacity are not distinct either from one another or from the perceptual one, although the being for them is distinct. **431a1**

To the thinking soul, however, appearances are like perceptual affections. And when it affirms or denies good or bad, it avoids or pursues. That is why the soul never understands without an appearance.[90] But just as the air made the eye-jelly be such-and-such, and it, in turn, something else, and hearing likewise, the last thing is one, and a single mean, but the being for it is manifold.

What it is by which it determines how sweet and hot differ was stated previously,[91] but one must also say the following. It is indeed one thing, but in the way a defining mark[92] is. And with respect to these, it—being one by analogy and in number—is with respect to each of the two as they are with respect to each other; for what is the difference between puzzling over how it discerns things that are not the same in kind and how it discerns contrary ones—for example, white and black? Let A (white), then, be to B (black) as C is to D, as those are to each other,[93] so that the alternation [A : C :: B : D] also holds. If, then, CD belong to one thing, it will be the case, as for AB too, that they will be one and the same, but the being for them will not be the same, and similarly for the other pair. And the same account would apply if A were the sweet thing and B the white. **431b1**

What is capable of understanding, then, understands the forms in the appearances, and since it is in them that what is to be pursued or avoided is distinguished for it, so, even outside of perception, whenever one is in the presence of appearances, one

88. 417b2–9.
89. *Met.* 1051b24–28.
90. *Mem.* 449b30–450a14.
91. 426b12–427a15.
92. Or limit (427a13).
93. Reading ὡς ἐκεῖνα πρὸς ἄλληλα.

is moved [to pursuit or avoidance]. For example, perceiving the beacon, because it is fire, one recognizes by the common [perceptual capacity], on seeing it moving, that it is the enemy, but when one calculates by means of the appearances or intelligible objects that are in the soul, just as if seeing them, one then deliberates about future things on the basis of present ones. And when one says there is the pleasant or painful, in that case one pursues or avoids—and so in cases of action generally.

Also, objects that are without reference to action, the true and the false, are in the same kind as the good and the bad; but in the former they differ unconditionally, in the latter relative to a person.

As for objects spoken of in abstraction, one understands them just as one would the snub: insofar as it is snub, not separately; but insofar as it is concave, if someone understood it actively, he would understand it without the flesh, in which the concavity is. That is the way it is with mathematical objects, which are not separable, but which one understands as separable, when one understands them.

But, in general, the active understanding is its objects. Whether or not it is possible for the understanding to understand any separated things when it is itself not separated from a spatial magnitude must be investigated later on.[94]

3.8
Scientific Knowledge, Perception, and Imagination

And now, summing up what has been said about the soul, let us say again that the soul is in a way all the beings; for the beings are either perceptible or intelligible, and scientific knowledge is in a way the scientifically knowable ones and perception the perceptible ones. In what way this is so one must inquire.

Scientific knowledge and perception are divided to correspond to the things, the potential to the potential, the actual to the actual. In the soul, what is capable of perception and what is capable of scientific knowledge are potentially these things, the latter the scientifically knowable ones, the former the perceptible ones. And these must be either the things themselves or their forms. But they are certainly not the **432^a1** things; for in fact it is not the stone that is in the soul, but its form. And so the soul is just like the hand; for in fact the hand is an instrument of instruments,[95] and the understanding is a form of forms, and a perceptual modality a form of perceptible objects.

But since there is no separated thing, it seems, beyond the perceptible magnitudes, it is in the perceptible forms that the intelligible objects are found—both those said in abstraction and those that are states and affections of perceptible things. And that is why, without perceiving, no one could learn or comprehend anything, and

94. This investigation is also mentioned at *Mem*. 450^a7–14, but is not in the extant treatises.
95. Cf. *PA* 687^a20–^{b}7.

when one contemplates, one must at the same time contemplate an appearance;[96] for appearances are like perceptual affections, except that they are without matter.

But imagination is distinct from affirmation and denial; for truth and falsity involve a combination of intelligible objects. But regarding the primary intelligible objects,[97] what difference does their not being appearances make? Or are the others not appearances either, although they are not found without appearances?

3.9
Soul as a Cause of Movement

Since the soul of animals has been defined[98] by two capacities, by the capacity to discern, which is the work of thought and perception, and further by the capacity for causing movement with respect to place, about perception and understanding let the previous determinations suffice—but about what exactly it is in the soul that moves things, one must investigate whether it is some part of the soul, separable either as a spatial magnitude or in account, or whether it is the whole soul, and, if it is some part, whether it is a special one beyond the ones usually spoken about and the ones mentioned, or whether it is one of these.

A puzzle is immediately involved, however, as to what way one should speak of parts of the soul and how many there are. For in a way there appear to be an unlimited number, and not only the ones that some people speak of[99] in distinguishing a rationally calculative part, a spirited part, and an appetitive part, and others,[100] the part that has reason and the non-rational part; for in virtue of the differences because of which they separate these, there will manifestly also be other parts with a greater contrast between them that these, namely, those that have now been spoken about, the nutritive part, which also belongs both to plants and to all animals, and the perceptual part, which could not easily be posited either as non-rational or as having reason. Further, there is the imaginative part,[101] the being for which is distinct from that of all the others, although which of them it is the same as and which it is distinct from involves much puzzlement, if one is to posit separate parts of the soul. And in addition to these there is the desiring part, which would seem to be distinct from all of them both in account and in capacity. And it would surely be absurd to break this up; for in the rationally calculative part there is wish, and in the non-rational part appetite and spirit; and so, if the soul is tripartite, there will be desire in each part.

96. *Sens*. 445b16–17.
97. *Met*. 1037a33–b6.
98. 427a17–19.
99. E.g., Plato, *Republic* 435c–441c.
100. E.g., *NE* 1102a26–32.
101. *Insomn*. 459a15–22.

To come in particular, then, to the point our account has now reached: what is it that moves the animal with respect to place? For movement with respect to growth and withering, which belongs to all, would seem to be caused by what all have, the generative and nutritive part. (Breathing in and out, and sleep and waking, must be investigated later on;[102] for they too involve much puzzlement.) But as regards movement with respect to place, what it is that causes animals to move by progression must be investigated. That it is not the nutritive capacity is clear; for this movement is always for the sake of something and also involves imagination or desire; for nothing that is not desiring or avoiding something is moved, except by force. Further, plants would be capable of movement, and would have some instrumental part for this sort of movement.

Similarly, it is not the perceptual part either; for there are many animals that have perception although they remain stationary and unable to move to the end of their lives.[103] If, then, nature does nothing pointlessly and leaves out none of the necessary things, except in things that are deformed or incomplete, while the animals of this sort are complete and not deformed (a sign of this is that they can generate offspring and have a prime of life and a withering), then they would also have instrumental parts for progression.

Nor is it the understanding part,[104] that is, what is called the understanding, that causes movement; for theoretical understanding does not understand anything doable in action, and says nothing about what is to be avoided and pursued, while the movement in question is always one of avoiding or pursuing something. But even when it does get a theoretical grasp on something of that sort, it does not at once urge pursuit or avoidance, for example, it often thinks of something frightening or pleasant, but it does not urge us to be afraid, although our heart is moved, or, if the thing is pleasant, some other part.

Further, even when the understanding does prescribe and thought tells us to avoid or pursue something, one is not moved, but [sometimes] acts in accord with appetite, like the person who lacks self-control. And, in general, we see that the one who has the craft of medicine does not [ipso facto] give treatment, implying that there is something else that has control of acting in accord with scientific knowledge, but not scientific knowledge. But then again desire does not have control of the movement in question either; for self-controlled people, even when they desire and have an appetite for things, do not do these things for which they have the desire, but instead follow the understanding.

102. *Somn.*, *Insomn.*, *Div. Somn.*, *Juv.*, *Long.*
103. 410^b19–20.
104. Reading τὸ νοητικὸν.

3.10
Understanding, Imagination, and Desire as Causes of Animal Movement

But manifestly these two things do cause movement, either desire or understanding—if one posits imagination as a sort of understanding; for in many cases people follow their imaginations against their scientific knowledge, and in the other animals understanding and rational calculation do not exist, although imagination does.

Therefore, both of these, understanding and desire, are capable of causing movement with respect to place, but understanding that rationally calculates for the sake of something, that is the practical sort, which differs from the theoretical sort with respect to its end. And all desire too is for the sake of something; for the object of desire is the starting-point of practical understanding, and the last thing is the starting-point of the action.[105] So it is reasonable that these two things appear to be the causes of movement: desire and practical thought; for the object of desire moves us, and, because of this, thought causes movement, because its starting-point is the object of desire. Imagination too, when it causes movement, does not cause movement in the absence of desire. There is, then, one thing that causes movement: the desiring part. For if there were two things that caused movement, understanding and desire, they would cause movement in virtue of some common form. But, as things stand, the understanding manifestly does not cause movement without desire (for wish is a desire, and when something is moved in accord with rational calculation, it is moved in accord with wish), and desire causes movement even contrary to rational calculation; for appetite is a sort of desire.

Understanding is in every case correct, while desire and imagination may be either correct or not correct. That is why what causes movement is always the object of desire, which is either the good or the apparent good—not every good, however, but the good that is doable in action. And what is doable in action is what admits of being otherwise.

Manifestly, then, it is a capacity of the soul of this sort—the one called desire—that causes movement. For those, on the other hand, who divide the soul into parts, and divide and separate them in accord with their capacities, the parts turn out to **433b1** be very many—a nutritive part, perceptual part, understanding part, deliberative part, and further, a desiring part; for these differ more from each other than do the appetitive and spirited part.

But since desires come about that are contrary to each other, and this happens when reason and appetites are contraries, and occurs in beings that have a perception of time (for the understanding urges us to resist because of the future, appetite because of the present; for the present pleasure appears both unconditionally pleasant and unconditionally good, because of not seeing the future), what moves us will yet be one

105. *Met.* 1021b29–30, *EE* 1219a11–12.

in form, namely, the desiring part insofar as it is desiring (but the primary [mover] of all is the object of desire; for it moves things without being moved, by being understood or imagined), although in number there will be more than one mover.

Since, then, there are three things, first, the mover, second, that by means of which it moves things, and third, the thing moved, and the mover is twofold, the unmoved one and the one that causes movement and is moved, there is, on the one hand, the one that is unmoved, which is the good that is doable in action, and, on the other, the one that moves and is moved, which is the desiring part (for what is moved is caused to move insofar as it desires, and desire, the active one, is a sort of movement), while the thing moved is the animal.

That by which desire moves is already something bodily—therefore, it is in the works common to body and soul that one must get a theoretical grasp on it. But to speak for now in summary form—what moves in an instrumental way is found where a starting-point and an end are the same, as, for example, in a hinge or ball-and-socket joint, since there the convex and concave are respectively the end and the starting-point [of movement] (that is why the one [the concave socket] remains at rest, while the other [the convex ball] moves), the two being distinct in account, but not separated as spatial magnitudes. For everything is moved by pushing and pulling, which is why, just as in the case of a circle [or sphere], so here too there must be something that remains fixed, and the movement must have it as starting-point.

In general, then, as was said, insofar as an animal is capable of desiring capacity, so far is it capable of moving itself. But it is not capable of desiring without imagination, and all imagination is either rationally calculative or perceptual. It is in the latter, then, that the other animals also have a share.

3.11
Causes of Animal Movement

But one must also investigate what it is that causes movement in the incomplete animals, the ones whose only perceptual modality is touch, and whether it is possible for imagination to belong to them or not, and for appetite too. For pain and pleasure are manifestly present in them, and if these are present, appetite must be too. But how could they have imagination? Or is it that just as they are moved in an indeterminate way, so too these things are present in them—but are present in an indeterminate way?

Perceptual imagination, as was said,[106] also belongs to the other animals, but the deliberative sort exists [only] in the rationally calculative ones (for whether to do this or that is already a work of rational calculation; and it is necessary to measure by one [standard]; for it pursues the greater [good]; and so it must be able to make one appearance from many). And this is the cause of these animals seeming not to have

106. 433b30.

belief, namely, that they do not have the [imagination] that results from a deduction, but this has that.

That is why desire does not have the deliberative capacity, but sometimes conquers and moves wish, while sometimes wish conquers and moves it, like a ball, the desire [doing it to] a desire, whenever lack of self-control occurs. But by nature the higher is more ruling and causes movement, so that there are already three spatial movements caused.[107] But the scientific part is not moved, but remains at rest. And since the one supposition and premise is universal and the other concerns particulars (for the first says that any man of such-and-such a sort should do an action of such-and-such a sort, and the second that this is an action of such-and-such a sort, and I am a man of such-and-such a sort), either it is the latter belief that produces movement, not the universal one, or it is both, but the one remains entirely at rest, while the other does not.

3.12
Interrelations of the Soul's Capacities (1)

The nutritive soul, then, must be possessed by everything that is alive and has a soul, and be possessed from its birth until its death; for what has been born must have growth, a prime of life, and a time of withering away, and these things are impossible without nourishment. Therefore, the nutritive capacity must be present in all things that grow and wither away.

Perception, on the other hand, is not necessarily present in all living things; for those things that have a body that is simple cannot have perception, and nor can those that are not receptive of the forms without the matter. But an animal must have perception, if nature does nothing pointlessly. For all things that are by nature are for the sake of something or will be concomitants of those things that are for the sake of something. Every body that moves by progression, then, if it did not have perception, would perish and fail to arrive at its end, which is the work of nature; for how would it be nourished? For the stationary ones this is indeed present where they have grown. However, it is not possible for a body to have a soul and an understanding that is capable of discerning but not to have perception, if it is not stationary and is generated; for why would it not have this? For either it would have to be better for the soul or for the body. But as things stand it would be so for neither; for the soul would not understand better, and for the body nothing would be better because of that. No body, therefore, that is not stationary has a soul without perception.

But then if it does have perception, the body must be either simple or mixed. But it cannot be simple; for then it will not have touch, but it is necessary for it to have this. This is clear from the following. For since the animal is an animate body, and

107. The one manifesting lack of self-control (appetite overcomes opposing wish); the one manifesting self-control (wish overcomes opposing appetite); and the one manifesting virtue of character (wish and appetite work together in harmony).

every body is tangible, and it is what is perceptible by touch that is tangible, the body of an animal must also be capable of touch, if the animal is to preserve itself. For the other perceptual modalities perceive through other things: smell, sight, and hearing. But if, when touching things, an animal does not have perception of them, it will be unable to avoid some of them and take others. And if that is so, it will be impossible for the animal to preserve itself.

That is why taste too is like a sort of touch; for it is concerned with nourishment, and nourishment is a tangible body. Sound, color, and odor, on the other hand, do not nourish, nor do they produce growth or withering. So it is necessary for taste too to be a sort of touch, because it is a perception of what is tangible and nourishing. These perceptual modalities, then, are necessary to the animal, and it is evident that it is not possible for an animal to exist without touch.

The others are for the sake of the good and it is not just to any random kind of animal but in some (for example, the kind that moves by progression) that their presence is necessary; for if an animal that moves by progression is going to preserve itself, it must perceive not only by touching but also from a distance. And this would be the case if it had the capacity to perceive through a medium, the latter being affected and moved by the perceptible object, and the animal by the medium. For just as when what moves something with respect to place makes it change to a certain extent, and what has pushed something else makes the latter push as well, the movement occurs through an intermediate, and just as the first moves and pushes without being pushed, and only the last is pushed and does not push, while the intermediate is both (and the intermediates are many), so it is too in the case of alteration, except that things are altered while remaining in the same place. For example, if someone presses into wax, the wax is moved to the extent that he presses, while stone is not moved at all, and water is moved to a further extent. Air, however, is moved to the greatest extent, and acts and is acted upon, if it remains in place as one thing.

That is why in the case of reflection too, it is better to say not that sight issuing [from the eye] is reflected back,[108] but that the air—to the extent that is one thing—is affected by shape and color. But over a smooth surface it is one thing, which is why it in turn moves sight, just as if the seal [pressed] into the wax were to pass on to the extent of reaching the limit.[109]

3.13
Interrelations of the Soul's Capacities (2)

It is evident that the body of an animal cannot be simple—I mean, for example, composed of fire or of air. For without touch it cannot have any other perceptual modality; for every animate body is capable of touch, as was said.[110] All the

108. Plato, *Timaeus* 45b–46c.
109. 427a13–14.
110. 434b11–19.

other elements, except earth, could come to be perceptual organs, but they all produce perception through something else, that is, through media, while touch involves touching things, which is why indeed it has this name. And yet even the other perceptual organs perceive by touch, but through something else, while touch alone seems to do so through itself. So none of these other elements could compose the body of an animal. Nor, then, can it be composed of [just] earth. For touch is, as it were, a mean between all tangible objects, and its perceptual organ is receptive not only of the differences in earth,[111] but also of hot and cold and all the other tangibles. And that is why we do not perceive with our bones, hair, or other such parts: because they are composed of earth. It is also because of this that plants have no perceptual modality at all, because they are composed of earth. But without touch no other perceptual modality can be present, and its perceptual organ is composed neither of earth nor of any of the other elements.

It is evident, therefore, that this is the only perceptual modality lacking which an animal must die; for it is not possible for anything to have this if it is not an animal, nor is there any besides it that something must have to be an animal. And that is why the other perceptible objects (for example, color, sound, and odor) do not in excess destroy the animal but only the perceptual organs—except coincidentally, such as when at the same time as the sound a push or a blow takes place); and by visible objects or an odor other things are caused to move which destroy by touch. And flavor too destroys only insofar as it is at the same time capable of touch. But excess in tangible objects—for example, hot ones, cold ones, or hard ones—does away with the animal; for excess in every perceptible object does away with the perceptual organ, so that in the case of tangible objects it does so to touch, which is what life is defined by; for it has been proved[112] that without touch it is impossible for an animal to exist. That is why excess in tangible objects destroys not only the perceptual organ but also the animal, because this is the only one that it must have.

The other perceptual modalities, as was said,[113] the animal has not for the sake of being but for the sake of well-being. For example, it has sight in order to see, since it lives in air or water, or, in general, in what is transparent; taste because of what is pleasant and painful, in order that it may perceive these in nourishment, have appetite, and be moved; hearing so that something may be signified to it; and a tongue so that it may signify something to another.

111. I.e., cold and dry.
112. $434^{b}11–19$.
113. $434^{b}24–27$.

DE SENSU ET SENSIBILIBUS*

On Perception and Perceptible Objects

1
Introduction

Since we have drawn our distinctions about the soul by itself, and about each of its capacities in turn, we must next make our investigation of animals and of all things that have life, as to which of their actions are special to some and which are common to all of them. What has been said about the soul, then, is to be assumed throughout, but let us speak about what remains, starting with what comes first. **436ª1** 5

It is evident that the most important [affections], both those that are common and those that are special to certain animals, are common to body and soul: perception, memory, spirit, appetite, and, in general, desire, and in addition to these, pleasure and pain. For these belong to pretty much all animals. 10

In addition, some [affections] are common to all things that partake of life, while others pertain only to some animals. The most important of them happen to be four pairs: wakefulness and sleep, youth and old age, inhaling and exhaling, and life and death. We will investigate them and determine what each of them is and due to what causes it occurs. 15

It is for the natural scientist also to consider the primary starting-points of health and disease; for neither health nor disease can occur in things deprived of life. That is why among pretty much most of the natural scientists and those among the doctors who pursue their craft in a more philosophical manner, the former end up discussing matters pertaining to the craft of medicine, while the latter begin their medical craft starting from matters pertaining to natural science.[1] 20 **436ᵇ1**

That all the [affections] mentioned are common to body and soul is not unclear. For they all take place either together with perception, or through perception; and some happen to be affections of perception, others states of perception; some of them protect and preserve it, while still others are destructions or privations of it. And that perception comes to the soul through the body is clear both with and without argument. 5

About perception and perceiving, however, what it is and due to what causes this affection takes place in the animals was spoken about previously in the *De Anima*. It is necessary that perception belongs to animals insofar as each one is an animal; for it is by this that we distinguish between being an animal and not being an animal. But, now, as for each particular perceptual modality, touch and taste necessarily go along 10

* Translated by Klaus Corcilius. Text: J. Winzenrieth, *Les* Parva Naturalia *d'Aristote: Édition et Interprétation* (PhD diss., Sorbonne, Paris & LMU Munich, 2023).

1. *Juv*. 480ᵇ22–30.

with all animals, touch due to the cause stated in the *De Anima*,[2] and taste because of nourishment; for it distinguishes the pleasant and the unpleasant in nourishment, so as to avoid the one and pursue the other, and flavor is, in general, an affection of what is nutritive.

The perceptual modalities that perceive through external media belong to animals that move by progression, that is, smell, hearing, and sight. They all belong to the animals that possess them for the sake of preservation, in order to pursue and perceive their nourishment beforehand and to avoid what is bad and destructive for them. But **437ᵃ1** to animals that also possess practical wisdom they belong for the sake of the good; for they report many differences, from which practical wisdom concerning intelligible objects and things doable in action comes about.

Of these latter perceptual modalities sight is superior with respect to what is necessary [for survival] and also intrinsically, but with respect to understanding and coincidentally it is hearing. For the capacity of sight reports many differences of all sorts, because all bodies partake of color, so that the common perceptibles too are most of all perceived through sight (by "common ones" I mean magnitude, shape, movement, number). Hearing reports only the differences of sounds, and to few animals also the differences of voice. But coincidentally hearing contributes the greatest share to practical wisdom. For speech, since it is audible, is a cause of learning, not intrinsically but coincidentally; for it consists of names and each name is a symbol. That is why among those deprived from birth of either of the two perceptual modalities, the blind tend to be more practically wise than the deaf and mute.

2
Composition of the Perceptual Organs: The Eye

About the capacity that each of the perceptual modalities possesses we have spoken previously;[3] about the body in whose perceptual organs they naturally come to reside, however, some [thinkers] inquire by distributing them among the elements of bodies. But since they are at a loss as to how to match four [elements] with five [perceptual modalities], they struggle about the fifth.

They all ascribe sight to fire because they are ignorant of the cause of a certain affection; for when the eye is pressed and moved it appears that fire flashes out from it. And this naturally occurs when it is dark, or else when the eyelids are closed; for then too there is darkness. But this also involves another puzzle. For if it is not possible for it to escape the notice of someone who is perceiving and seeing that he is seeing something, it is immediately necessary that the eye sees itself. Why, then, does this not occur when the eye is at rest?

2. 2.5–12.
3. *DA* 2.7–11.

The causes of this, and also of the puzzle connected to the belief that sight is fire, must be grasped from the following. Smooth things naturally shine in the dark, although certainly without producing light, and the so-called black and middle of the eye is smooth. And this [flashing out of fire] appears when the eye is [pressed and] moved because what happens is just as if the one thing became two. This is the effect of the speed of the movement, so that what sees and what is seen seem to be different. That is also why this does not happen unless [the eye is moved] swiftly and in darkness; for what is smooth naturally shines in the dark (for example, the heads of certain fishes and the ink of the cuttlefish), and so when the eye changes slowly what sees and what is seen do not seem to be one and two at the same time as a result. And in that way, the eye sees itself just as it does in a reflection.

For if sight really was fire, as Empedocles says[4] and is written in the *Timaeus*,[5] and seeing did take place by the emission of light, as if from a lantern, why would the eye not also see in the dark? To claim that it is extinguished when issuing out [from the eye] in darkness, as the *Timaeus* says, is completely empty. For what is extinction of light supposed to be? For it is by something wet or cold that the hot and dry is extinguished, as seems to be the case with fire and the flame in coal-like things, but it is evident that neither of these things holds true of light. If, however, it[6] is present [in light] but it escapes our notice because of its feebleness, then light, by day and during rain, would have to be extinguished, and it would have to get darker during frost; at any rate, flame and bodies on fire undergo some such affection. But none of this occurs in the case at hand.

Empedocles seems at times to think that we see when the light is emitting [from our eyes], as has been said before. At any rate, he says this:

> As when a man planning a journey had armed his lamp
> —the gleam of a fire blazing through the stormy night—
> by adjusting sides thereto, protections against winds of all kinds,
> which scatter the breath of the blowing winds,
> but the fire that was leaping outward according to its expansion,
> [where] they were perforated straight ahead with wonderful [passages],
> was shining down upon his doorstep with incessant beams—
> So at that time the primeval fire, enclosed in the membranes,
> spread through the ring-shaped iris by means of fine pores,
> which, while fending off the depth of the water flowing around,
> let the fire pass outward according to its expansion.[7]

4. 437ᵇ23–438ª3.
5. 45b–d, 67e–68b.
6. I.e., the hot and the dry.
7. B84 DK. Trans. Primavesi.

Sometimes, then, this is how he says that we see, but at other times he says that we see by means of the effluences from the objects seen.

Democritus, when claiming that the eye is water, speaks correctly, but he does not speak correctly in thinking that seeing is mirroring; for this occurs because the eye is smooth, and it is not in it but in the one who is seeing. For this affection is reflection, but it seems that there was not yet anything clear to him in universal terms concerning mirroring and reflection. But it is strange too that it did not occur to him to be puzzled about why it is only the eye that sees, but none of the other things in which mirror images appear.

It is true, then, that the eye consists of water. However, seeing does not take place insofar as it is water but insofar as it is transparent, which is common also to air. But water is easier to confine and compress than air. That is why the eye-jelly and the eye consist of water. This is also clear from the facts themselves. For when the eyes are destroyed it is evident that what flows out is water, and at least in very young fetuses, the eye-jelly is excessively cold and bright; and in blooded animals the white of the eye is fatty and oily, in order that its liquid may remain unfrozen. That is why the eye is the part of the body that is most insensitive to cold; for no one has ever felt cold under the eyelids. The eyes of non-blooded animals have a hard skin [instead of eyelids] and this is what provides them with shelter.

It is wholly absurd, though, for the eye to see because of the emission of something that either extends as far as the stars or grows together [with rays that proceed from the object] once it goes out a certain distance, as some say.[8] For it would be better [to say that] it grows together where the eye begins. But this is naive too; for what does it mean to say that light grows together with light? Or how is it possible for this to happen? For it is not any random thing that grows together with any other random
438b1 thing. And how can the internal light grow together with the external light? For the membrane [of the eye] is in between them.

We have spoken elsewhere[9] about the fact that one cannot see without light. But whether it is light or air that lies between the object seen and the eye, it is the movement that goes through this that produces the seeing.[10] And it is reasonable that the inner part of the eye consists of water; for water is transparent. And just as seeing on the outside is not possible without light, so also on the inside. Therefore, it must be transparent. Therefore, it is necessary for it to be water, given that it is not air. For the soul, or better, the perceptual part of the soul, is not located on the eye's surface, but clearly inside. That is precisely why it is necessary for the inner part of the eye to be transparent and receptive of light. And this is also clear from what happens. For to some who were struck in battle by a blow on their temple so that the eye ducts[11] were severed, it seemed that darkness was falling, as if a lamp had been put out, because

8. Plato, *Timaeus* 45c.
9. *DA* 418a27–b3.
10. *GA* 780a3–4, 781a3–12.
11. *HA* 495a11–18, *PA* 656b16–18.

the transparent part, the so-called eye-jelly, which is like a sort of lantern screen, had been severed.

So, if these things happen in the way we say they do, it is clear that if one must in this way assign and attach each of the perceptual organs to one of the elements, one must suppose that the part of the eye that is capable of seeing is composed of water, that what is capable of perceiving sounds is composed of air, and that that of smell is composed of fire—for what smelling is actively, that is what the part that is capable of smelling is potentially. For the perceptible object makes the perceptual modality active, so that it is necessary for it to be potentially the object previously. An odor is a sort of smoky exhalation, and smoky exhalations originate from fire. That is also why the perceptual organ special to smell has its place in the brain. For the matter of what is cold is potentially hot. And the process of generation of the eye takes place in the same way. For its constitution originates from the brain; for it is the wettest and coldest of the parts in the body. What is capable of touch is composed of earth, and the capacity of taste is a certain form of touch. And because of this the perceptual organ of both taste and touch is located near the heart; for it is set over against the brain and it is the hottest of the parts.

And as regards the perceptual parts of the body, then, let the distinctions be made in this way.

3
Sight and Color

About the perceptible objects corresponding to each of the perceptual organs—I mean color, sound, smell, flavor, and touch—we have spoken in universal terms in the *De Anima*,[12] as to what their work is, that is, what as regards each of the perceptual organs its activity is. But what exactly one should say about what each single one of them is—for example, what color, sound, smell, or flavor is, and similarly also about touch, must be investigated, and first about color.

Each, then, is said of things in two ways: in activity or in potentiality. In which way, then, active color and sound are the same as, or different from, the active perceptions—that is, seeing and hearing—has been stated in the *De Anima*.[13] But let us now say what each of them must be in order to produce the active perception.

As has been said in that investigation[14] about light, that it is coincidentally the color of the transparent—for whenever something fiery is in something transparent, its presence is light, and its privation is darkness. And what we call "transparent" is not special to air, water, or any other of the bodies called "transparent," but is a common nature and capacity, which is not separable, but in them, and is also present

12. 2.7–11.
13. 425^{b}26–28, 426^{a}10–12.
14. *DA* 418^{a}11–12.

in other bodies, in some more and in some less. Just as, then, it is also necessary for there to be some extremity of the bodies, so too of this nature. The nature of light, then, is present in the transparent as in something indeterminate. But it is clear that the extremity of the transparent present in bodies must be something, and that this is color will be apparent from the facts. For in that case color is in the limit insofar as it is a limit (that is also why the Pythagoreans used to call the surface "color"); for it is in the limit of the body, but is not the body's limit; rather, one must regard precisely the same nature that is colored outside as also colored inside.

439ᵇ1 Both air and water appear colored; for their gleam is also of this quality. But in the former case, because their color is in something indeterminate, neither the air nor the sea have the same color for those who approach them from nearby or at a distance. In bodies, by contrast, unless the environment makes them change, the appearance of their color is determinate as well. It is clear, therefore, that it is the same thing that is capable of receiving color in the one case as in the other. Therefore, inasmuch as it is present in the bodies (and it is more or less present in all of them), the transparent makes them partake of color.

But since color is in the limit, it would be a sort of limit [of the transparent]. So color would be the limit of the transparent in a determinate body. And regarding the transparent bodies themselves—for example, of water and of anything else of this sort—in all of them that appear to have a color of their own, it is present at the extremity of all of them in the same way.

Precisely the same thing, then, that produces light in the air can also be present in the transparent, and it can also not be present, but lacking. So just as in the air one of them is light and the other darkness, so white and black come to be present in bodies.

But it is necessary now to speak about the other colors by determining in how many ways they can come about. For it is possible that they come about in the following way, namely, that the white and the black are so juxtaposed that each of them is invisible on account of its smallness while their combination is visible. For this combination cannot appear either white or black. But since it is necessary that it have some color, and neither of these two is possible, it is necessary that it be something mixed and another form of color. In this way, then, it is possible to suppose that there is a plurality of colors besides white and black, and that the plurality is due to the ratio. For it is possible for them to be juxtaposed in a ratio of three to two, or three to four, or in accord with other numbers; others, however, may in general be juxtaposed in accord with no ratio, but in accord with some excess and deficiency that is incommensurable. And they will certainly behave in the same way as concordant sounds. For the colors that are [mixed] in the simplest numerical ratios, just like the concordant ones there (and these seem to be the most pleasing of the colors, like **440ª1** purple and red, but there are few of this sort, and for the same reason that explains why there are few concords too); and those that are not [mixed] in numerical ratios are the other colors. Or may it also be that all colors are [mixed] in numerical ratios,

those that are ordered at least, while those that are not, as well as the previous ones when they are not pure, are such because they are not [mixed] in numerical ratios?

This, then, is one mode of generation for the colors. Another is for them to appear through each other, as painters sometimes produce them, when they paint one color over another more manifest color, as, for example, when they wish to make something appear to be in water or in air, and as the sun by itself appears white, but red [when viewed] through mist and smoke. There will be many colors also in the same way as the one mentioned earlier; for there should be some ratio of the colors at the surface to those underneath, while others may not stand in any ratio at all.

To say, then, as the ancients did, that color is an effluence and that it is seen due a cause of this sort is absurd. For it is necessary for them then to make perception be in every case due to contact, so that it is better to say from the outset that perception occurs due to the medium of perception being moved by the perceptible object than [to invoke] contact and effluences.

In the case of juxtaposed colors, it is necessary to accept that there is an invisible magnitude, just as it is necessary to accept that there is an imperceptible time, in order that the incoming movements may escape our notice and appear to be one [color] because of their simultaneous appearance. But here[15] there is no such necessity. On the contrary, when the color at the surface is unmoved as when it is moved by the underlying color, it will not produce the same movement. That is why in fact it appears to be another color and neither white nor black. Therefore, if there cannot be any invisible magnitude, but everything is visible from some given distance, then this very juxtaposition [of colors] will be a sort of mixture of colors. And in this other way [of generating colors by superposition] nothing prevents a sort of ordinary color from appearing to those who view it from afar. That there is indeed no invisible magnitude must be investigated later on.[16]

But whether there can be a mixture of bodies, not only in the way which some believe to be the only one (namely, by a juxtaposing of their smallest parts that is not evident to us through perception), but wholly and completely in every way, just as has been stated in universal terms as regards all bodies in the investigation of mixture,[17] [cannot be discussed here, but has to be presupposed]. For in that other way those things alone admit of being mixed that can be divided into smallest parts, like human beings, horses, or seeds. For of human beings, a human being is the smallest part, and of horses, a horse, so that it is by means of their juxtaposition that the joint mass of both is "mixed." But we do not say that one human being can be mixed with one horse. For all the things, however, that do not divide into smallest parts, it is not possible that a mixture of them comes about in that way, but only by means of all of them being mixed completely; and these very things are by nature most apt for

15. I.e., in the case of the superimposed colors.
16. 445^{b}20–29, 446^{a}16–20.
17. *GC* 1.10.

mixture. How it is possible that this [complete] mixture comes about has been stated previously in the investigations concerning mixture.[18]

At the same time, in what way it is necessary that when things are mixed their colors are mixed too, is clear, and also that this is the principal cause of why there are many colors, and not superposition or juxtaposition. For it is not the case that the mixed ingredients result in the appearance of one color if viewed from far away and not so if viewed from close, but rather from everywhere. And there will be many colors because it is possible to mix the ingredients with each other in accord with many ratios, either in numerical ratios or in accord with excess only.

And the other things we have said about the juxtaposed or the superimposed colors can also be applied in the same way to those involving mixture. Due to what cause the forms of colors are determinate and not unlimited in number, and also those of taste and of sounds, must be investigated later on.[19]

4
Flavor

What color is and due to which cause there are many colors has been stated, then, and about sound and voice we have spoken previously in the *De Anima*.[20] Now we must speak of smell and flavor. For they are pretty much the same affection, but they are not each present in the same [things]. The flavor kind is clearer to us than the **441ª1** smell kind. The cause of this is that smell is the worst even among our own perceptual modalities, while touch is the most exact, in comparison to all the other animals, and taste is a sort of touch.

The nature of water tends to be flavorless. And it is necessary either that the water will have the kinds of flavors in itself but they will be imperceptible on account of [their] smallness, as Empedocles claims;[21] or else that water is a certain sort of matter, like a universal seedbed[22] of flavors, and that while all flavors come from water, each single one of them comes from a distinct part of it; or that water possesses no internal differentiation [in terms of flavors] and that what acts on it is the cause [of the flavors]—for example, if one were to say that heat and the sun [are such causes].

Among these three views, the falsity of the way Empedocles speaks is exceedingly easy to detect. For we see that the flavors of fruits change due to the heat when they are picked to be exposed in the sun and roasted. This implies that they do not come about due to drawing something from the water but due to changes that occur in the fruit itself. And when they are dried and are left lying for some time, they change

18. *GC* 1.10.
19. 445^b20–29, 446^a16–20.
20. 2.8–9.
21. B102 DK.
22. Cf. *Ph.* 203^a21–22.

from sweet to harsh and bitter, and acquire all sorts of flavors. And when they are boiled, they change into (one might almost say) all kinds of flavors.

Similarly, it is also impossible for water to be the matter of a universal seedbed [of flavors]; for we see that from the same water as nourishment[23] distinct flavors are produced.

The remaining option, then, is that the water changes by means of a certain affection. It is clear, therefore, that water does not acquire this capacity, which we call "flavor," due to the capacity of the heat alone. For water is the finest-grained of all liquids, even finer-grained than oil itself (though oil extends over a broader area than water on account of its viscosity). Water, by contrast, is non-viscous, which is also why it is more difficult to keep water in one's hand than oil. And since it is evident that water by itself alone does not become coarse-grained when heated, it is clear that the cause [of the flavor] must be something else; for all the flavors exhibit a greater degree of coarse-grainedness [than water].[24] Heat is [just] a co-cause.

All the flavors that are present in the fruits also appear to occur in earth. That is why many of the ancient natural scientists say that water is like the earth through which it travels. And this is especially clear in the case of saltwater; for salt is a form of earth. Also, when waters are filtered through ash, which is bitter, it makes the flavor bitter. And there are many springs that are bitter, or sharp, or have all sorts of other flavors.

It is reasonable that the flavor kind occurs the most in plants. For the wet, just like everything else, is naturally affected by its contrary. And the contrary of the wet is the dry. That is why [water] is somehow affected by fire; for the nature of fire is dry, but heat is a special affection of fire, and the dry a special affection of earth, as was said in the investigations concerning the elements.[25] Insofar as it is fire, then, or insofar as it is earth, it will not affect or be affected in any way, and neither will any other body, but rather insofar as there is a contrariety present in each of them, to that extent all things both affect and are affected.

In just the way, then, in which those who steep colors or flavors in liquid make the water have that same quality, in that same way nature too [steeps] the dry and the earthen [in liquid], and by filtering the liquid through the dry and earthen and causing it to move by means of heat, it makes it acquire a certain quality. And this is flavor, the affection in the wet produced by the dry just mentioned that is capable of altering [the perceptual modality of] taste from potentiality to activity. For it brings the perceptual part into that state, which was previously in one of potentiality. For perceiving does not correspond to learning but to contemplating.

That the flavors are not an affection or a privation of everything dry but only of what is nourishing, one must grasp from the following. Neither the dry without

23. I.e., for fruits and the like.
24. Since they are sorts of humors or "juices."
25. *GC* 2.2–3.

the wet nor the wet without the dry [has flavor]; for one [of them] by itself is no nourishment for animals and moreover also not for plants, but only the mixture. And of the nourishment received by animals it is the tangible among the perceptible [bodies] that produce growth and withering. For it is the cause of these things insofar as what is received is hot or cold (for it is these that produce growth and withering), but it nourishes insofar as what is received is tasteable (for all are nourished by what is sweet, either simply so or mixed).

One must make determinations concerning these things in the investigations concerning generation,[26] now, however, we touch upon them only as far as is necessary. For the hot causes growth, crafts the nourishment, by means of drawing upward what is light, and leaving behind what is salty and bitter due to their heaviness.

And, indeed, what the external heat does in external bodies, this is what the [internal heat] in the nature of animals and plants [does], which is why they are nourished by the sweet. Other flavors are mixed into the nourishment in the same way as the salty and sharp take the place of seasoning, because of these counterbalancing the excessive nourishing effect of the sweet and its tendency to remain on the surface [of the stomach].

In the same way in which the colors are mixtures of white and black, so the flavors are of sweet and bitter, and are so, then, in accord with a ratio of the more and the less, either in accord with certain numbers belonging to the mixture or movement,[27] or else in an indeterminate way. Those flavors, however, that when mixed produce pleasure occur only in numerical proportions. The flavor of the sweet is the oily, and the salty and the bitter are pretty much the same, and the pungent, harsh, astringent, and sharp are in between. For the forms of flavors are pretty much equal in number to those of the colors. For there are seven forms of each of them, provided one takes, as is reasonable, the gray to be some sort of black. It remains, in fact, that yellow pertains to white just as the oily pertains to the sweet, and that red, purple, green, and blue are between white and black, and the other colors mixed from them. And just as black is a privation of the white in the transparent, so the salty and the bitter are privations of the sweet in the nourishing liquid. That is also why the ash of everything that has been burned up is bitter; for what is drinkable has been extracted from it.

Democritus and most of the natural scientists who speak about perception do something that is extremely absurd. For they make all perceptible objects tangible ones. And yet, if this is how things are, it is clear that each of the other perceptual modalities will be a sort of touch. But it is not difficult to see that this is impossible. Further, they all treat objects that are common to all perceptual modalities as special perceptibles. For magnitude and shape, the rough and the smooth, and also the sharp and the dull in solid objects, are common to the perceptual modalities, and if not common to all, they are at least common to sight and touch. That is also why

26. *GA* 762ᵃ12–13, 776ᵃ28–30.
27. 440ᵃ20–31.

the perceptual modalities can be mistaken about the common perceptibles, but not mistaken about the special ones—for example, sight about color and hearing about sounds.

Others reduce the special perceptibles to the common ones, as Democritus does;[28] for he says that the white and the black are one rough and the other smooth, and he reduces the flavors to the shapes [of atoms]. And yet, to recognize the common ones either belongs to no [particular] perceptual modality or else it belongs more to sight.[29] But if it belongs more to taste, then since it belongs to the most exact perceptual modality to discern among the smallest items in each kind, it follows that taste would also have to perceive the other common perceptibles best and be most apt for discerning the shapes.

Further, all perceptible objects involve contrariety—for example, in color, the white is contrary to the black and in flavors the bitter is contrary to the sweet. But it does not seem to be the case that shape is contrary to shape; for which of the polygons is contrary to the circle? Further, since shapes are unlimited in number, it is necessary that the flavors be unlimited in number as well; for why would one [flavor produced by a given shape] produce perception and another not?

The tasteable and flavor have now been spoken about. For the investigation of the other affections of the flavors properly belong to the natural inquiry concerning the plants.[30]

5
Smell and Odor

It is in the same way that one should also understand the case of odor. For what the dry produces in liquid[31] is precisely what the flavored and wet produces in another kind, in air and water alike. And even though we predicated "transparent" of them in common just now,[32] it is not insofar as it is transparent that the smellable is such, but insofar as it is capable of washing and cleansing what is flavored and dry. For the smellable is not only present in air but also in water. This is clear in the cases of the fishes and the hard-shelled animals. For they are observed to smell even though there is neither air in the water (for air floats to the surface when it occurs in the water) nor do they breathe. If, then, one were to assume that air and water are both wet, it would follow that odor would be the nature of what is flavored and dry present in what is wet, and that the smellable would be this sort of thing.

28. A135 DK.
29. 437ᵃ5–9.
30. Not extant.
31. 441ᵇ15–23.
32. 438ᵃ14–15.

That the affection comes from something flavored is clear from a consideration of the things that have an odor and those that do not. For the elements—fire, water, air, earth—are odorless, because both the dry and the wet among them are flavorless, unless one produces a mixture of them. And that is why the sea has an odor—for it has flavor and dryness—and why salt is more odorous than soda[33] (as the oil it exudes shows), while soda is more earthen. Further, stone is odorless, for it has no flavor. Woods, by contrast, are odorous, for they have flavor; but among these, the watery ones are less so. Further, in the case of metals, gold is odorless, for it has no flavor, while bronze and iron are odorous. But when the liquid is burned away, the dross of all of them becomes more odorless. Also silver and tin are more odorous than some and less so than other [metals]; for they are watery.

Some believe that the smoky exhalation is odor, since it is common to earth and air, and everyone is inclined to say this about odor. That is also why Heraclitus spoke in this way, saying that if all the beings were to become smoke, noses would distinguish them.[34] But everyone is inclined to say this about odor, some saying it is vapor, others that it is an exhalation, and still others that it is both of these. But vapor is some sort of the wet, and the smoky exhalation, as was said,[35] is common to air and earth, and water is formed from vapor, and a certain form of earth is formed from the smoky exhalation. But [odor] does not seem to be either of them. For vapor consists of water, and it is impossible for the smoky exhalation to occur in water. But the animals in the water also smell, as was said previously.[36] Further, exhalation is invoked in
443b1 a similar way to the effluences;[37] if the latter is not correct, then neither is the former.

That it is possible to enjoy the wet, both in the breath and in the water, and to be somehow affected by what is flavored and dry, is not unclear. For air too is in its nature wet. Also, if indeed what is [flavored and] dry produces an effect like being washed out in liquids and in the air, it is evident that smells must be analogous to flavors. But surely this *is* what happens in some cases. For there are pungent and sweet smells, and also harsh, astringent, and oily smells, and one may say that rotten smells are analogous to bitter flavors, which is why just as bitter things are hard to swallow, rotten ones are hard to inhale. It is clear, therefore, that the precise thing that is flavor in water is odor in air and water. And that is why cold and solidification dull flavors and make smells disappear; for cooling and solidification make the heat, which is the mover and producer [of these affections], disappear.

There are two forms of the smellable; for it is not the case, as some claim,[38] that there are no forms of the smellable, because there are. But one must distinguish in which way there are and in which way there are not.

33. Sodium carbonate.
34. B7 DK.
35. 443a21–22.
36. 443a3–6.
37. 440a15–20, 442a29–b23.
38. Plato, *Timaeus* 66 D.

One form of the smellable is ordered in accord with the flavors, as we have said,[39] and they are pleasant and painful coincidentally. For because they are affections of what is nourishing, to those that have an appetitive for it, its odors are pleasant, but they are not pleasant to those that are full or not in need of anything, and they are also not pleasant to any of those to whom the nourishment that has these odors is not pleasant either. Therefore, these smells, as we have said, are coincidentally pleasant and painful, which is also why they are common to all animals. The other odors, by contrast, are intrinsically pleasant—for example, those of flowers. For they neither provide any invitation, either more or less, in relation to nourishment, nor do they contribute anything in relation to appetite, but rather the contrary. For what Strattis said when mocking Euripides is true: "when you boil lentils don't pour in perfume."[40] And those who nowadays mix such potent ingredients into drinks force the pleasure by habituation, until something pleasant arises from two perceptions as if it were from one.

This form of the smellable is special to human beings, whereas the one that is ordered in accord with the flavors belongs also to the other animals, as was said previously.[41] And the forms of those odors, because they are pleasant coincidentally, are divided in accord with the flavors, but this form is no longer [divided in this way], because its nature is intrinsically pleasant or painful. The cause of this sort of smell being special to human beings is because of the cooling in the region around the brain. For since the brain is by nature cold, and the blood in the small blood vessels around it is fine-grained and pure, but easily cooled (which is also why the exhalation from the nourishment when cooled by this place causes diseased discharges), this form of smell serves human beings as an aid for health; for it has no other work. And it manifestly does it; for nourishment, both dry and wet, since it is pleasant, is often unhealthy, but the aid resulting from the smell of an object that has an intrinsically pleasant smell is (one might almost say) always beneficial whatever condition they happen to be in. And that is why it occurs through respiration, not in all animals, but in human beings and among blooded animals in the four-footed ones and in all those that share more in the nature of air. For since the odors rise toward the brain, due to the lightness of their heat, the parts of the body around that place are in a healthier condition. For the capacity of smell is hot in nature. But nature has made use of breathing for two things: for the work of aiding the chest and for the secondary work of smelling;[42] for during breathing it produces a movement through the nostrils as if from a side entrance. And this form of odor is special to the nature of the human being because he has the largest and also the wettest brain for his size in comparison with the other animals. In fact, it is because of this that (one might almost say) only the human being that perceives and enjoys the odors of flowers and other such

39. 443^{b}7–8.
40. Fr. 45 Kock.
41. 443^{b}26.
42. *Juv*. 473^{a}19–25.

things. For the heat and movement of these odors is commensurable with the excess
444ᵇ1 of the wetness and coldness in this place. To all those animals that have lungs, due to the fact that they breathe, nature has given the capacity to perceive the first kind of odor, so as not having to produce two perceptual organs. For, since they too breathe
5 in this way, just as in human beings it is enough for the perception of both [forms] of smellable things, in these animals it is enough for the perception of the first only.

That the non-breathing animals have a perception of the smellable is evident. For fishes and the entire insect kind all perceive it exactly even from a distance, due to the
10 nourishment-related form of smell, even when far away from their proper nourishment, like the bees do with their honey and the kind of small ants, which some call *knipes*.[43] And among the marine animals, the purpuras and many other animals of this sort are capable of sharply perceiving their nourishment due to its odor.

15 What they perceive it with, however, is not equally evident. That is why one might be puzzled as to the means by which they perceive smell, if indeed in breathing animals smelling comes about in only one way (for this appears to be the case in all breathing animals), but none of these animals breathes, although they do perceive [odor]—unless there is another perceptual modality beyond the five. But this
20 is impossible. For smelling is of the smellable, and these animals do perceive it, although not perhaps in the same way. In animals that breathe, the breath takes away something that lies on [the organ of smell] like a sort of lid, which is why they do not perceive when they do not breathe; but in non-breathing animals this is taken away, just as in the case of the eyes some animals have eyelids and cannot see unless they
25 uncover their eyes, while the hard-eyed animals do not have eyelids, which is also why they have no additional need of anything for uncovering them, but see immediately from the moment this is possible for them.

Similarly too, none of the other animals is annoyed by the odor of the things that are intrinsically malodorous, unless one happens to be destructive. And due to
30 these they are destroyed in the same way as human beings also get headaches and often are destroyed by the vapor of charcoal; in this same way, the other animals are destroyed by capacity that brimstone has and bituminous materials, and they avoid
445ª1 them because of this effect. But they are not at all concerned with the intrinsically bad odor—and indeed many plants do have bad odors—unless it contributes something to the flavor or food for them.

It seems that the perception of smell—since the perceptual modalities are odd in
5 number and an odd number has a middle—is itself in the middle between the tactile ones (touch and taste) and those that perceive through something else (sight and hearing). That is also why the smellable is an affection of things that nourish (and these belong to the tangible kind) and also of what is audible and what is visible,
10 which is why it is both in air and water that they can be smelled. So the smellable is common to both of these, and belongs to the tangible and to the audible and

43. Reading κνίπας. Cf. *HA* 534ᵇ19.

transparent. That is also why it was reasonable to have compared it[44] to a sort of dipping and washing of the dry in the wet and liquid.

Let this much be said about how one should, and should not, speak of forms of the smellable.

What some Pythagoreans claim is not reasonable; for they say that some animals nourish themselves by smells. For, in the first place, we see that nourishment must be compound; for the beings that nourish themselves are not simple either, which is also why there are residues of their nourishment, either inside them or outside, as in the plants, and since not even water is able to nourish [them] by itself, alone and unmixed (for it is necessary for what is to constitute the compound to be something corporeal), it makes still less sense to make of the air something corporeal. In addition, because there is a place in all animals that is receptive of nourishment, from which, when it is drawn in, the body takes it, while the perceptual organ for what is smellable is located in the head and the odor enters together with a breath-like exhalation, it follows that the nourishment should go into the place of respiration. That the smellable, then, insofar as it is smellable, does not contribute to nourishment is clear; that it contributes to health, however, is evident both from observation and from what has been said.

So the precise thing that flavor is in nourishment and in relation to beings that nourish themselves, the smellable is in relation to health.

Let [the objects of the perceptual modalities] with respect to each of the organs of perception, then, be determined in this way. **445b1**

6
Puzzles about Perceptible Objects

One might raise a puzzle as to whether, if every body is divisible without limit, the perceptible affections—for example, color, flavor, smell, sound, weight, cold and hot, and hard and soft—are so too. Or is this impossible? For each of them is productive of the corresponding perception (for they are all said to be so because they are capable of moving perception). So it is necessary for the perception to be divisible without limit and for every magnitude to be perceptible (for it is impossible to see something white without it having a certain magnitude). For if this were not so, it would be possible for there to be a body that has neither color nor weight nor any other affection of this sort, so that it would not be perceptible at all; for these [affections] *are* the perceptibles. Therefore, the perceptible object will not be composed of perceptible objects. But this is necessary. For it will not be composed of mathematical ones, at any rate.

44. 442b27–29.

Further, by what [capacity] will we discern and know them? Is it by means of the understanding? But they are not intelligible objects, and the understanding does not understand external objects unless it is accompanied by perception.[45] At the same time, if these things were so, it would seem to provide evidence for those who posit indivisible magnitudes; for in this way the argument would be resolved. But [indivisible magnitudes] are impossible, and we have spoken about them in our investigations concerning movement.[46]

As regards the resolution of these puzzles, it will simultaneously become clear why the kinds of color, of flavor, of sounds, and of the other perceptible objects are limited in number. For when things have extremes, what is inside them is necessarily finite. But the contraries are extremes, and every perceptible object involves contrariety—for example, in color, white and black; in flavor, sweet and bitter; and likewise in all other cases the contraries are extremes.

What is continuous, then, divides into an unlimited number of unequal parts, but into a limited number of equal ones. But what is not intrinsically continuous divides into a limited number of forms. Since, then, the affections must be regarded as forms, and there is always continuity in them, one must grasp that what is potentially and what is actively are distinct. And that is why, when we see a grain of millet, the ten-thousandth part of it escapes notice, even though the sight went over it, and the
446ᵃ1 sound within the quarter-tone escapes notice, even though one hears the entire tune, which is continuous; it is the interval of what lies in between the extreme sounds that escapes notice.

It is the same way too with the altogether small parts in the other perceptible objects; for they are visible potentially, but not actively, when they are not separated (for the foot length is potentially present in the two-foot length, but actively so when it has been separated). But if increments so small were separated, it would be reasonable if they dissolved into their environment, like a flavored droplet poured into the sea. But then, since the increment of the perception is neither perceptible by itself nor separable (for the increment is potentially present in the more exact perception), a perceptible object of that size, if separated, cannot be actively perceived either. But it will be perceptible nonetheless; for it is already so in potentiality, and it will be actively so if it is added [to an object of larger size].

That some magnitudes and affections escape notice, then, and due to what cause and in what way they are perceptible objects and in what way they are not, has now been stated. Hence, whenever certain quantities are present in [some object] in such a way that they are also actively perceptible, not only because they are contained in the whole but separate from it, it is necessary that these colors, flavors, and sounds are limited in number.

45. *DA* 432ᵃ7–10.
46. *Ph.* 6.1–2.

One might raise a puzzle: Do perceptible objects or the movements from perceptible objects (in whichever way perception comes about), when active, arrive at the middle first, as odor and sound manifestly do? For the smell is first perceived up close, and the sound reaches us after the blow. Is this also the case with what is seen and with light—just as Empedocles claims[47] that the light from the sun first arrives in the middle before it arrives at our sight or at the earth? It would seem reasonable if this happened. For what is being moved is moved from somewhere to somewhere, so that necessarily there is also a time in which it is moved from the one place to the other. But all time is divisible,[48] so that there was a time when the ray of light was not yet seen but was still spatially moving in the middle. And if every animal **446^{b}1** simultaneously hears and has heard, and, in general, perceives and has perceived, and there is no process of coming to be for them, but they exist without coming to be, nonetheless, in spite of all that, just as the sound has not yet reached the ear even though the blow has already occurred (and the change in the shape of articulate sounds shows that their spatial movement occurs in the middle; for what one hears is not what was said because the letters change their shape while the air is spatially moving), is this also the case for color and light? For it is surely not merely because they stand in a relation that one thing sees and the other is seen, like things that are equal; for in that case it would not be necessary for each of them to have a particular location. For to those things that become equal it makes no difference whether they are near or far away from each other. Or is it rather as regards sound and smell that this is reasonable? For just as in the case of air and water, the movement of both of them is divided into parts, while they are continuous in a different way. And that is why the same thing is in one way smelled by the first person and by the later one, and in another way not.

Some people think that there is a puzzle even about this. For some people say that it is impossible for one person to hear, see, or smell the same thing as another; for it is not possible for many people, since they are separate, to hear and smell [the same thing]; for that would require one and the same thing to be separate from itself. Or is it that, in the case of what first initiated the movement, for example, the bell, frankincense, or fire, all perceive one and numerically the same object, while the special perceptible [given to each of their perceptions] is distinct in number, though the same in form, which is why many people can see and smell and hear it at the same time? For these are neither bodies—but an affection and a sort of movement (for otherwise this [simultaneous perception] would not have occurred)—nor can they exist without body.

But concerning light there is another account. For light exists due to something being present [in something] but is not a movement. And, in general, things do not happen the same way in alteration and in spatial movement.

47. A57 DK.
48. *Ph.* 6.4.

For it is reasonable that spatial movements arrive first in the middle (and sound seems to be a movement of something that spatially moves), but things that undergo alteration are no longer like that. For it is possible for something to undergo alteration all at once and not one half before [the other], just as water solidifies all at the same time. Nonetheless, when what undergoes heating or solidification happens to be a large quantity, one part is affected by the part next to it, and it is necessary that the first part will change due to the thing itself that causes the alteration, and will undergo alteration at the same time all at once.

Tasting would be like smell if we lived in water and perceived [the tasteable object] from far away before making [direct] contact with it.

It is reasonable, then, to say that not all of what lies between [the perceptible object] and the perceptual organ is affected at the same time, with the exception of light, because of what we have said, and due to the same thing, in the case of seeing too; for it is light that produces seeing.

7
Perceiving More Than One Object at the Same Time

There is also another puzzle about the perceptual modalities that is as follows: Is it possible to perceive two objects together in the same undivided time, or not? Suppose, then, that the greater movement always knocks out the smaller one, which is why people do not perceive things that are brought right before their eyes, if they happen to be thinking intensely about something, or are afraid, or hear a loud noise. Let this, then, be assumed, and also that each thing can be better perceived when it is simple than when it is mixed—for example, wine that is unmixed than when it is mixed, and honey, and color, and also the highest pitch alone than together with the octave, because these things obliterate each other. And this is the effect produced by things from which some single item comes about. If, then, the greater movement knocks out the smaller, when they occur at the same time, it is necessary for that movement to be less perceptible than if it occurred alone; for the smaller movement will take away something of the larger when mixed with it, if indeed everything simple is more perceptible.

Therefore, if there are distinct movements of equal size, there will be no perception of either of them; for each will obliterate the other to the same extent, and to perceive [either of them] as simple is not possible. So either there will be no perception at all or another perception that results from both. And this is precisely what seems to occur in the case of things that are mixed, whatever the way is in which they may be mixed.

Since, then, in some cases something new emerges from [the co-occurrence of movements], while in other cases nothing new emerges, and these are the sorts of things that pertain to different perceptual modalities (for only things whose extremes

are contraries mix; for it is not possible for one thing to come about from white and high-pitched, except coincidentally, that is, not in the way in which a concord **447ᵇ1**
emerges from high-pitched and low-pitched), it follows that it is not possible either to perceive them at the same time. For if the movements are equal, they will obliterate each other, since no single movement will emerge from them; but when they are not equal, only the stronger will produce perception. 5

Further, if the soul is more likely to perceive two things at the same time by one perception if they pertain to the same perceptual modality, for example, high-pitched and low-pitched (for the movement of a single perceptual modality is simultaneous with itself to a higher degree than the movement of two, for example, of sight and hearing), and if, on the other hand, it is not possible to perceive two things with the same perceptual modality unless they are mixed (for the mixture tends to be one 10
thing, and of one thing there is one perception at the same time, and one perception occurs at the same time as itself), it follows of necessity that [only] mixed things can be perceived at the same time, because they are perceived by one active perception; for one active perception is of what is numerically one, while one potential perception is of what is one in form. Therefore, if the active perception is one, [the soul] will say that these movements are one. Therefore, they have necessarily been mixed. 15
Therefore, when they have not been mixed, there will be two active perceptions. But pertaining to one capacity and an undivided time the activity is necessarily one. For one use and movement is of one thing at once, and the corresponding capacity is one. It is not possible, therefore, to perceive two things at the same time by means of one 20
perceptual modality.

But then, if it is impossible to perceive things falling under the same perceptual modality at the same time when they are two, it is evident that it will be even less possible to perceive things at the same time if they pertain to two perceptual modalities—for example, white and sweet. For it appears that the soul expresses something's being one in number in virtue of nothing other than the simultaneity [of its perception], but [expresses] its being one in form in virtue of the [sameness 25
of the] perceptual modality discerning [it], that is, in virtue of the way [it does so]. I mean this: surely, the same perceptual modality discerns the white and the black, which are different in form; while the sweet and the bitter are discerned by a perceptual modality, which, while the same as itself, is different from the former; but though each perceives its contraries in a different way, they perceive their corresponding objects in the same way. For example, in the same way in which taste discerns the sweet, so sight discerns the white, and in the way the latter discerns 30
the black, so the former discerns the bitter. Further, if the movements of contrary **448ᵃ1**
objects are contrary to each other, and it is not possible for contraries to occur together in what is the same and undivided [time], and if contraries fall under one and the same perceptual modality, like sweet [is contrary in relation] to bitter, then it is not possible to perceive them at the same time. And it is similarly clear for the 5

ones that are not contraries;[49] for one part [of the colors] is on the side of the white, the other of the black, and similarly for the others, as some flavors are on the side of the sweet, others on the side of the bitter.

Nor can the mixed ones be perceived at the same time; for they are ratios of opposites, such as the chord of the octave and of the fifth, unless they are perceived as one. But in this way the ratio of the extremes comes about as one; but otherwise not; for then there would be at the same time the ratio of the many to the few (or of the even to the odd) and of the few to the many (or of the odd to the even).

If, then, the objects that are said to be "corresponding ones,"[50] though they are distinct in kind, are even more distant and different from each other than those that are the same in kind (I mean, for example, that the sweet and the white are corresponding, though distinct in kind, while the sweet is even more different from the black in form than the white is), it would be even less possible to perceive them simultaneously than those that are the same in kind, so that if the latter cannot be perceived at the same time, neither can the former.

As for what some of those concerned with musical concords claim, namely, that the sounds do not arrive at the same time (though they appear to do so), and it escapes our notice whenever the time is imperceptible, are they correct in claiming this or not? For perhaps, as things stand, one might also claim beyond this that it seems that we see and hear at the same time, because the intermediate times escape our notice. Or is this not true, and it is not possible for any time to be imperceptible or to escape our notice, but rather every time admits of being perceived? For if, while someone perceives himself or something else in a continuous time, it is not possible at that time for him not to notice that he exists, and if there is a time in that continuum so small that it is wholly imperceptible, it is clear that at that time he would not notice if he himself exists, and while he sees and perceives, if he perceives.

Further, there would be neither a time during which he perceives nor any object that he perceives, unless it is in this way, namely, by perceiving during a part of that time or by seeing a part of the object, if indeed there is any magnitude, whether of time or object, that is wholly imperceptible because of its smallness. For if he sees the whole line [AB], and perceives it continuously during that time in this way, namely, by perceiving in some part of that time, then let CB, during which he does not perceive it, be taken away. Surely, then, he perceives during some part [of this remaining time] or he sees some part of [the line], just as he sees the whole earth, because he sees this particular part of it, and as he walks during a whole year, because he walks during this particular part of it. But during part CB he perceives nothing. Therefore, it is by means of perceiving during a part of the time, and by perceiving a part of AB, that he is said to perceive the whole AB and the whole line. And the same argument

49. I.e., the intermediate ones, which, in the case of colors, belong to the black if black predominates in them, and to the white, if white does.
50. 447b30.

applies to AC as well. For his perception is always during some part and of some part, but the whole ACB cannot be perceived.

All [magnitudes] are perceptible, then, but do not appear to have the magnitude they have. For one sees the magnitude of the sun and of the four-cubit object from afar, but they do not appear to be of that size, but sometimes they appear to be indivisible, but one does not see an indivisible object. The cause was stated in the previous discussion concerning this issue.[51] That there is no imperceptible time, then, is clear from this.

But the previously mentioned puzzle must be investigated, as to whether it is possible or not possible to perceive a plurality of objects at the same time. By "at the same time" I mean in one and indivisible time in relation to each other.

First, then, is it possible in this way, when they are perceived at the same time but with a distinct part of the soul, and not in an indivisible time, but in one that is invisible in the sense that the whole is continuous? Or, is it that, first, with regard to the objects of one perceptual modality (I mean, for example, sight), if the soul perceives one color with one part and another color with another part, it will have a plurality of parts that are the same in form (for what it perceives is in the same kind)? But if someone were to claim that, as there are in fact two eyes, nothing prevents this from also being the case in the soul, one must reply that presumably from these one thing emerges, and so the activity of these is one; but here [in the soul], if one thing emerges from both, this will be what perceives, but if they are separate, the two cases will not be alike. Further, perceptual modalities that are the same will be many in number [because their activations are many], as if one were to declare indistinguishable sciences [to be many, on the same grounds]. [But this is not possible.] For the activity will not exist without its corresponding capacity, nor will there be perception without this capacity.

But if *this* object is perceived in one indivisible time, it is clear that the other objects will be too. If, then, the soul perceives sweet with one part and white with another part, what results from them will either be one or not one. But it must be one. For the part capable of perception is one part [of the soul]. What, then, will its one corresponding object be? For no single object is composed of these.[52] It is necessary, therefore, that there will be one part with which the soul perceives everything, as was said previously,[53] but one kind through one part [of it], another through another.

Is the capacity to perceive sweet and white—insofar as it is actively undivided—one thing, then, but distinct [ones] whenever it becomes actively divided? Or is what is possible in the case of things themselves likewise possible in the case of the soul as well? For what is white and sweet, and many other things too, is numerically one and the same thing. For, if the affections of things are not separate from each other, the

51. $445^{b}3$–$446^{a}20$.
52. I.e., white, sweet, and so on.
53. *DA* $426^{b}23$–$427^{a}14$.

being, however, is distinct for each of them. Therefore, we should similarly posit also in the case of the soul that the part capable of perceiving everything is numerically one and the same but the being for it is distinct—in kind in the case of some things, in form in the case of others. So the soul perceives [a plurality of objects] at the same time and with a part that is the same and one, but not the same in account.

That every perceptible object is a magnitude, and that there is no indivisible perceptible object, is evident. For the distance from which an object could not be seen is without limit, but the distance from which it can be seen is limited. And similarly also in the case of smellable objects, audible objects, and all the objects we perceive without [direct] contact. There is, then, a last point of the distance from which the object is not seen and a first one from which it is seen. This point, beyond which it is not possible to perceive that the object exists and before which the object is necessarily perceived, must be indivisible. If, then, there is an indivisible perceptible object, whenever it is placed at the extreme point from which it last cannot be perceived and first can be perceived, it will turn out to be visible and invisible at the same time. But this is impossible.

449b1 The perceptual organs, then, and the perceptible objects, what way things stand with respect to them both in common and in regard to each perceptual organ, have now been spoken about. Of the remaining issues, memory, remembering, and sleep must be investigated first.

ON MEMORY AND RECOLLECTION*

1
Definition and Explanation of Memory

Concerning memory and remembering we must say what it is, due to what cause it occurs, and to which part of the soul both this affection, and also recollection, belong. For it is not the same people who are good at remembering and at recollecting, but for the most part those who are slow are good at remembering, while those who are quick and learn with ease are better at recollecting.

First, then, we must grasp what sorts of things can be remembered; for often there is error about this. For neither is it possible to remember the future—which is rather the object of belief or of expectation (and there might even exist a science concerned with expectation, just as some people say that the craft of prophecy is)—nor is it possible to remember the present, but only to perceive it, because with perception we know neither the future nor the past but only the present. Memory, however, is of the past. As for the present while it is present, nobody would say that he remembers it—for example, this particular white thing while he sees it. Nor would he say that he remembers what he contemplates while engaged in contemplation and understanding; instead, of the former he would say only that he perceives it, and of the latter only that he scientifically knows it. But whenever he possesses the scientific knowledge or the perception without their actual objects, then he remembers that he has learned or contemplated that the angles of the triangle are equal to two right angles, or that he has heard or seen it or something like that. For always when he is actively remembering he says in his soul that he has heard, perceived, or understood it before.

Memory, then, is neither perception nor supposition but rather a state or an affection of one of these when time has passed. Of the now, and in the now, there is no memory, as was said,[1] but of the present there is perception, of the future there is expectation, and of the past there is memory. That is why all memory involves time. So only those animals that perceive time can remember and [they do this] by means of that by which they perceive it.

* Translated by Klaus Corcilius. Text: As for *De Sensu*.

1. 449^{b}13–18.

Further, we have spoken about imagination previously in the *De Anima*,[2] and understanding is not possible without an appearance[3]—for in understanding precisely the same thing happens as in drawing a figure. For in drawing it, even though we do not make use of the fact that the triangle is of a determinate quantity, we nontheless draw it as having a determinate quantity; and in the same way a person who is understanding, even when he does not understand something quantitative, puts something quantitative before his eyes, but does not understand it insofar as it is a quantity. And when the nature of what he understands belongs to quantitative things, but of indeterminate size, he posits it as a determinate quantity but understands it only insofar as it is a quantity.

Due to what cause it is not possible to understand anything without a continuum nor without time is a matter for another account.[4] But it is necessary that one knows magnitude and movement by the same means by which one also knows time, and the appearance is an affection of the common perception, so that it is evident that the knowledge of them is by means of the primary perceptual capacity. And memory, including the memory of intelligible objects, is not possible without an appearance. So memory belongs to the understanding part coincidentally, but intrinsically to the primary perceptual capacity. That is also why it belongs to some of the other animals and not only to the human being, that is, to those that possess belief or thought.[5] And if memory were one of the understanding parts, it would not occur in many of the other animals, and perhaps in none of the mortal animals, since, even as things stand, it does not belong to all of them because not all of them have a perception of time. For always, when one is active with one's memory, just as we have said previously,[6] one additionally perceives that one knew this or heard or experienced it before, and the before and after are in time.

To which part of the soul memory belongs, then, is evident: it belongs to precisely the part to which imagination also does. And the intrinsic objects of memory are the things of which there is imagination, and the coincidental objects of memory are all those that are not without imagination.[7]

One might raise a puzzle as to how one may ever, while the affection is present and the object absent, remember what is not present. For it is clear that one must understand the affection that takes place in the soul through perception, and in the part of the body that possesses it, like a sort of picture, the having of which we call "memory." For the movement which comes about is impressed like a sort of imprint of the perceptual affection, like those who seal documents with their signet rings make.

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2. 3.3.
3. *DA* 431a17.
4. *DA* 3.6.
5. *HA* 588a18–b3, *GA* 753a11–17.
6. 449b19–23.
7. I.e., intelligible objects.

That is also why in some people who are much in movement, due to feeling or to young age, the imprint does not come about, just as if the movement or the seal **450ᵇ1** were to encounter running water; while in others, because they are worn away like old buildings, and because of the hardness of what is to receive the affection, the imprint does not enter in the first place. That is why those who are very young and those who are old are forgetful; for they are in flux, the young on account of their growth, the old on account of their withering away. And, similarly, neither the exceedingly quick nor the exceedingly slow appear to have good memory, because the former are wetter, and the latter are harder than what is needed. In the case of the young, then, the appearance does not remain in the soul, while in the case of the old it does not take hold.

But if this is indeed what happens with regard to memory, does one remember the affection or the thing from which the affection originated? For, if the former, we would not remember any of the things that are absent; and if the latter, how do we, while we perceive, remember what we do not perceive, namely, what is absent? And if it is like an imprint or a picture in us, why would the perception of it be a memory of something else and not of that imprint or picture itself? For the person who is active with his memory contemplates this affection and perceives it. How, then, will he remember what is not present? For then it would also be possible to see what is not present or to hear it.

Or is there a way in which this is possible and does happen? For just as a picture drawn on a panel is both a picture and a likeness, that is, one and the same thing is both of these, yet the being is not the same for both, and it is possible to contemplate it both as a painting and as a likeness, so in this same way one should also suppose that the appearance in us is both something intrinsically and the appearance of something else. Insofar as it is intrinsically something, then, it is an object of contemplation or an appearance, and insofar as it is of something else, it is like a likeness and an object of memory. So too whenever the movement belonging to the appearance is active, and the soul perceives it in the way it is intrinsically, it appears to enter [the soul] like an object of thought or an appearance; if, on the other hand, it [perceives it] as of something else and like a picture, the soul contemplates it as a likeness, and, even though it has not seen Coriscus, contemplates it as Coriscus. In this latter case, the experience of the contemplation is other than when the soul contemplates [the appearance simply] as a drawn picture, and in the soul the latter occurs like an intelligible object only, while in the former way, because it is a likeness, **451ᵃ1** it occurs as an object of memory.

And that is why we sometimes do not know, when movements of this sort occur in our soul due to prior perception, or whether they are in accord with our prior perception, and sometimes we are in doubt whether this is a memory or not. And sometimes it happens that we think and recollect that we have heard or seen something before. This occurs whenever one changes, while contemplating something as itself, and contemplates it as of something else. The contrary happens sometimes as well, as it happened to Antipheron of Oreos and to other deranged people; for they spoke

of their appearances as of past events and as if they were remembering them. This happens whenever one contemplates what is not a likeliness as if it were a likeness.

Mnemonic exercises preserve memory by means of repeated recollection. This is nothing other than often contemplating [an image] as a likeness and not as it is in itself.

What memory and remembering is, then, has been stated: it is the having of an appearance as a likeness of what it is an appearance of, and also to what part in us it belongs, namely, the primary perceptual one,[8] that is, the one by means of which we perceive time.

2
Definition and Explanation of Recollection

It remains to speak about recollecting. First, then, everything that is true in the tentative discussions[9] must be set down as facts. For recollection is neither the recovery of a memory nor is it its acquisition. For when one learns or is affected for the first time, one neither recovers any memory (for there was none before), nor does one acquire it from the start; for it is when the state or affection has come about in one that there is memory, so that it does not come about together with the affection that has come about.

Further, when [the affection] has come about for the first time, in that indivisible and ultimate moment, the affection is already present in the person thus affected, that is, the scientific knowledge, if one must call the state or the affection "scientific knowledge" (and nothing prevents us from also coincidentally remembering some of the things that we know). But the remembering as such does not exist before time has passed; for one remembers now what one has seen or experienced before, one does not remember now what one has experienced just now.

Further, it is evident that it is possible for someone to remember something without having recollected it just now, but rather having perceived or experienced it from the start. But whenever one recovers the knowledge or perception one had before (or whatever we said[10] it is the having of which is memory), this is [recollection] and then the recollecting of one of the items just mentioned can take place, the remembering occurs and the memory follows.

But surely these things are not [recollected] unconditionally when, having been previously present in one, they come about in one again; rather, in a way they are, and in another way they are not. For it is possible for the same person to learn and discover the same thing twice. Recollecting, then, must be different from such cases, and recollecting must require the presence of a richer starting-point than the one from which they learn [the same thing for a second time].

8. *DA* 422b23, 424a25.
9. Reference unclear.
10. 451a15–16.

Recollections take place when one movement naturally occurs after another. For if this happens of necessity, it is clear that whenever the first movement occurs, the second movement will occur, and if not of necessity, it will occur for the most part. It happens that some people become more habituated by being moved just once than others by having been moved many times. That is why we remember some things better, even though we have seen them only once, than others that we have seen many times.

Whenever we recollect, then, we are moved by a certain one of the antecedent movements, until we are moved by a movement that is habitually followed by that one. That is also why we hunt [for the latter] using what comes next in sequence by proceeding in our understanding from the present or from some other time, and from what is similar, or contrary, or close to the one we are searching for.

That is why recollection occurs; for some of the movements of these things are the same [as the one sought], some of them occur at the same time, and some of them have a part of it, so that little remains for one to be moved by after it. People search, then, in this way, and even when they are not searching, they recollect in this way, whenever the movement they are searching for occurs after another. But for the most part the movement they are searching for occurred after other movements of the sort we mentioned have occurred.

And one must not investigate how we recall what is distant from us, but what is nearby; for it is clear that the way [of finding the movement] is somehow the same. What I mean [by "what is nearby"] is what is next without having previously searched for or recollected [it]. For the movements follow each other through habit, this one after the other, and whenever one wishes to recollect, therefore, this is what one will do: one will seek to get hold of a starting-point of movement, after which the one sought will occur.

That is why recollections that begin from a starting-point occur in the quickest and best way. For as the things stand in relation to each other with regard to their **452^{a}1** sequence, so too do the movements. And all movements that have a certain order are easy to remember, such as mathematical objects, while those that are poorly ordered are difficult to remember.

Also, recollecting is different from relearning in that one will be capable somehow of being moved by oneself toward what comes after the starting-point. But whenever this is not the case, and one is moved by something else, one is no longer reminding oneself. Often, though, one is incapable of recollecting something immediately, but when one searches, one is capable and finds it. And this happens when one brings about many movements, until one causes the sort of movement that is followed by the thing one is searching for. For reminding oneself consists in the internal presence of the capacity to cause movement; and this in such a way as to be moved by oneself, that is, from the movements one possesses, as was said.

But one must get hold of a starting point. That is why people sometimes seem to recollect from places.[11] The cause is that they move quickly from one thing to the

11. E.g., in a mnemonic device.

other—for example, from milk to white, from white to air, and from this to wet, from which one recalls fall, which was the season one was searching for.

The universal seems to be a starting-point and the middle in all cases; for if one does not do so before, one will remind oneself whenever one arrives at this middle point, or else one no longer knows from where else to start. For example, suppose one understands the sequence as marked by A B C D E F G H [Fig. 1].

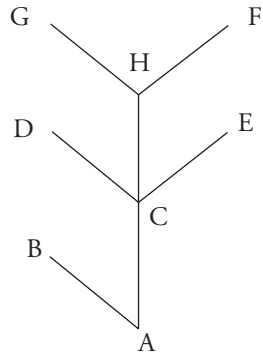

Fig. 1

For if one has not reminded oneself at C—for from there it is possible to be moved both toward D and toward E—and if one was not searching for one of them, one will remind oneself when one arrives at H, if one is searching for G or F. And one keeps going in this way.

The cause of our sometimes reminding ourselves from the same starting-point and sometimes not is that it is possible to be moved in a plurality of directions from the same starting-point—for example, from C toward E or D. Whenever, then, we are moved after a very long time, we will move toward what is more habitual; for habit is already like nature. That is why we recollect quickly the movements we do frequently; for just as one thing comes after another by nature, so also do activities. And frequency [in the activities we engage in] produces a nature.

But since in nature things happen both contrary to nature and by luck, and this happens even more so in movements due to habit, which, at any rate, are not equally natural, so that sometimes one is not moved in that direction [in which one wishes to be moved], especially if one pulls oneself away from there. That is why, when we need to remember a name which is similar to a name we know, we commit a slip of the tongue with respect to it.[12]

Recollection, then, comes about in this way. Most importantly, however, one must know the time [that has elapsed], either by a measure or indeterminately. But there

12. E.g., saying "Cathleen" for "Catherine."

was something by which one discerned the greater and lesser time.[13] It is reasonable that this takes place in the same way in which one discriminates magnitudes. For one understands magnitudes as great and distant not by stretching out one's thought to the object, as some people[14] claim we stretch out our sight (for one can in the same way understand non-existent things), but by a proportional movement; for in it there are similar shapes and movements.

In what way, then, will it be different when one understands larger objects? Is it that one understands the [internal objects], which are smaller (for all internal objects are smaller), and, proportionally, the external objects as well? Perhaps, then, just as with [perceptual] forms, it is possible to take something proportional, but inside oneself, so also with their distances. Thus, if one is moved in movement AB and BE [Fig. 2], one produces[15] CD, for AC and CD are proportional.

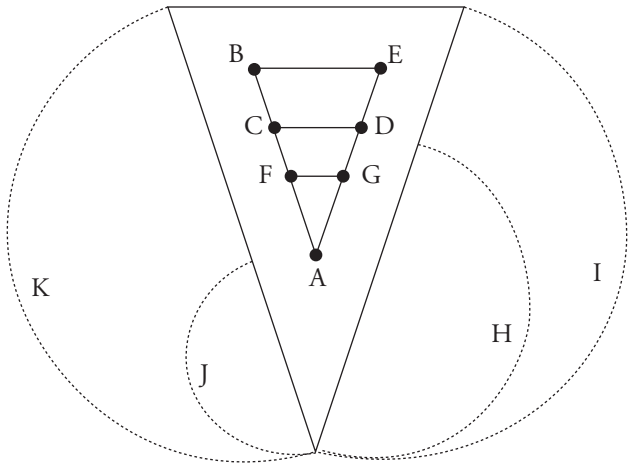

Fig. 2

Why, then, does one produce movement CD rather than FG? Or is it because AC is to AB as H is to I? And one is accordingly also simultaneously moved in these movements. And if one wishes to understand FG, one will in that same way understand BE, and instead of HI one will understand JK. For they are related as FA is to BA.

Thus, whenever the movement of the sought object occurs simultaneously with that of the time, then one is active with one's memory. And if one merely thinks one is, but one is not producing [these movements], one merely thinks that one remembers. For nothing prevents someone from being mistaken and believing that he is remembering when he is not remembering. But to be active with one's memory and not to think so, and to remember without noticing it, is not possible; for that very

13. 449ᵇ28–30.
14. *Sens.* 437ᵇ9–438ᵃ5.
15. I.e., represents by way of.

thing was the remembering. But when the movement of the object occurs without the movement of the time, or the latter without the former, one does not remember.

The movement of time is twofold. For sometimes one does not remember the time in terms of a measure, for example, that it was three days ago (one does, however, remember that one did something at some time), and sometimes one remembers the time in terms of a measure. But one remembers even when it is not in terms of a measure. And people are accustomed to say that they remember something, but do not know when [it occurred], whenever they are unaware of the quantity of time in terms of a measure.

That not the same people are good at remembering and at recollecting was stated previously.[16] But remembering is different from recollecting not only with respect to time but in that many of the other animals have a share in remembering as well, but (one might almost say) none of the known animals has a share in recollecting, except for the human being. The cause of this is that recollecting is like a sort of deduction. For one who recollects deduces what he previously saw, heard, or was affected by in some such way, and it is like a sort of search. And by nature it occurs only in those animals that also have the deliberative capacity; for deliberating too is like a sort of deduction.

A sign that the affection is something bodily, and that recollection is a search for an appearance in this domain, is that some people get troubled when they cannot recollect in spite of having directed their thought to it, and also when they nonetheless recollect even when they are not trying anymore, and this is especially the case with impulsive people, for the appearances move them most intensely. The cause of its not being up to them is this. Just as it is not any longer up to those who throw a ball to make it stop, in this same way too the person who is recollecting and hunting for something sets in movement a sort of bodily affection. Most troubled by this are those who happen to have liquid around the place of the perceptual part; for the liquid does not easily stop moving, until what they seek returns and the movement proceeds in a straight course. That is why episodes of anger and fear, when they cause such movements, do not calm down in spite of reverse contrary movements [of those who undergo these movements], but set up countermovements in the same direction. This affection is like when some name, tune, or saying is very much on one's lips. For even though having stopped ourselves, and having no wish to, it comes upon us to sing it or say it again.

Those who have larger upper bodies and those who are dwarf-like have poorer memory than those with the contrary stature, because much weight rests on their perceptual part, which means that from the start the movements cannot stay but dissolve instead, and they also do not easily move in a straight course during recollection. Those who are altogether young and exceedingly old are forgetful because of the movement involved; for the latter are withering, the former growing very rapidly. Further, children are also dwarf-like until they advance in age.

Memory and remembering, then, what their nature is and by means of which part of the soul animals remember, and also recollecting, what it is, how it occurs, and due to what cause, have now been spoken about.

16. 449b6–8.

ON SLEEP AND WAKING*

De Somno et Vigilia

1
Introduction

As regards sleep and waking it must be investigated both what they are and whether they are special to the soul or to the body, or common to both; and if they are common to both, to which part of the soul or of the body they belong, and due to what cause they belong to the animals. Also, whether all animals share in both of them, whether some share in sleep alone and others in the other alone, or whether some share in neither and some others in both. In addition, it must be investigated what a dream is, and due to what cause those who are asleep sometimes dream and sometimes do not dream, or whether it so happens that those who are asleep always dream but do not remember it, and if this happens, due to what cause it happens. Also, whether it is possible or not possible to foresee what will happen in the future, and if it is possible in which way; and whether only those future things that are done by human beings can be foreseen or also those for which the daimonic is the cause, and come about by nature or spontaneously.

That waking and sleep belong to the same part of the animal is evident. For they are opposed to each other and it seems that sleep is some sort of privation of waking. For the extreme opposites, both in others and also in natural things, manifestly always occur in the same recipient, that is, they are affections of the same thing. I mean, for example, health and disease, beauty and ugliness, strength and weakness, seeing and blindness, hearing and deafness. Further, this is also clear from the following. For what we recognize whether someone is awake by is **454ª1** also what we recognize whether he is asleep by. For we think that the one who is perceiving is awake, and that the one who is awake is perceiving either one of the external things or one of the movements that take place in himself. If to be awake, therefore, lies in nothing other than in perceiving, it is clear that it is by virtue of the very same thing that those who are awake are awake and that those who are asleep are asleep. And since perceiving is neither special to the soul nor to the body (for what the capacity belongs to the actuality belongs to as well, and what is called perception in actuality is a sort of movement of the soul through the body), it is evident that the affection is neither special to the soul nor is it possible for a soulless body to perceive.

* Translated by Klaus Corcilius. Text: As for *De Sensu*.

Since we have made our distinctions previously elsewhere[1] about what are called "parts" of the soul, and the nutritive part was separated from the other parts in the things that possess life, while none of the other parts can exist without it, it is clear that all living things that participate only in growth and withering possess neither sleep nor waking, such as the plants (for they do not have the perceptual part, whether it is separable or not separable; for it is separable in capacity and in being).

Likewise it is clear too that there is nothing that is always awake or always sleeping; rather, both of these affections belong to the same animals. For if there is an animal that does not possess perception, it is not possible for it to sleep or to be awake (for both of these affections have to do with a disposition of the primary perceptual part); nor is it possible for one of them always to belong to the same animal—for example, a kind of animal that always sleeps or a kind that is always awake.

Further, for everything that has a natural work, whenever it exceeds the time [for its exercise], or for doing one of the things that it is capable of doing, it must become incapacitated—for example, the eyes when they see for too long, and so cease doing this; and likewise the hand too, and everything else that has a work. If, then, to perceive is the work of something, this too, when it exceeds the time during which it was capable of perceiving continuously, will become incapacitated and will not do it any longer.

If, therefore, to be awake is defined by the release of perception [from sleep], and, among contraries, it is necessary for one of the two to be present and the other not, if to be awake is contrary to sleeping, and it is necessary for one of the two to belong to every animal, then sleeping is necessary. If this sort of affection is sleep, then, and it is an incapacity due to an excess of being awake, and the excess of being awake is sometimes connected to illness and sometimes occurs without illness, so that the incapacity and its release will occur in the same way, it is necessary that every animal that is awake can sleep. For it is impossible to be always active.

Nor, similarly, can any animal always sleep. For sleep is a certain affection of the perceptual part, like a sort of fetter and inability to move, so that it is necessary for every animal that sleeps to possess the perceptual part. But a perceptual part is what is capable of perceiving in actuality. And it is impossible to be active with one's perception in the strict sense and unconditionally and at the same time to sleep. That is why it is necessary that all sleep admits of awaking.

Pretty much all other animals clearly have a share in sleep, whether swimming, winged, or footed. For in fact the kinds of fishes and of the soft-bodied animals have been observed sleeping, and also all other animals that have eyes; for even the hard-eyed animals and the insects manifestly do sleep, but all these animals have short sleeps, which is why one might often not notice whether they participate in sleep or not. As for the hard-shelled animals, it has not yet become clear to observation whether they sleep. But if the argument we have advanced is persuasive to anyone, he will be persuaded by it.

1. *DA* 2.2–3, 3.9.

That all animals have a share in sleep, then, is evident from the following. For the animal is defined by the possession of perception, and we say that sleep is in some way the inability of perception to move, like a fetter, whose release and loosening is waking. But none of the plants is capable of having a share in either of these affections. For without perception there is neither sleep nor waking. And those who possess perception also possess pain and pleasure, and those who possess these also possess appetite. But plants have none of these. A sign of this is that the nutritive part does its work more during sleep than during wakefulness. For then animals nourish themselves and **455ᵃ1** grow more, which suggests that they do not need perception for these tasks.

2
Why Sleeping and Waking Occur

Why animals sleep and are awake and due to which sort of perceptual modality, or which sorts if it is due to several of them, must be investigated. Since, then, some animals possess all the perceptual modalities, and some do not possess sight, while all possess touch and taste, except if one of the animals is incomplete (we have spoken about this in the *De Anima*[2]) and it is impossible for an animal unconditionally to perceive with any of the perceptual modalities whatever while asleep, it is evident that the same affection necessarily belongs to all perceptual modalities during what is called "sleep." For if the affection belongs to one perceptual modality but not to another, the animal will perceive with the latter while asleep, which is impossible.

Since each perceptual modality has something special to it, and also something common—for example, special to sight is seeing, and to hearing to hear, and the same account applies to the other perceptual modalities. But there is also a common capacity, one that goes along with all these, and with which one also perceives that one sees and hears. For it is clearly not with the sight that one sees that one sees, and it is also clearly neither by way of taste nor sight nor with both that one discerns, and is capable of discerning, that sweet things are distinct from white things, but rather with a certain part that is common to all perceptual capacities. For there is one perception, and the controlling [perceptual organ] is one, but the being for perception is distinct for each kind—for example, of sound and of color. And [this common capacity] occurs above all together with the capacity of touch. For this can be separated from the other perceptual organs, whereas the others are inseparable from it. (We have spoken about these things in our observations in the *De Anima*.[3]) It is evident, therefore, that waking and sleep are affections of this common capacity. That is also why it belongs to all animals; for touch alone also belongs to all.

2. 425ᵃ10–11, 432ᵇ20–25.
3. 413ᵇ4–10, 414ᵃ2–4, 415ᵃ3–6, 435ᵃ12–14, ᵇ2.

For if sleep came about by way of an affection of all the perceptual modalities, it would be strange if those perceptual modalities, for which it is neither necessary nor possible in a certain way to be active at the same time, were necessarily inactive and immovable at the same time. For it would make more sense if the contrary happened to them, namely, not to be at rest at the same time. And the way we now speak is reasonable also in regard to this. For when the perceptual organ that controls all the others, and toward which the others are directed, undergoes some affection, it is necessary that the remaining ones are all affected along with it, while when one of the latter is incapacitated, it is not necessary for it to be incapacitated.

It is evident from many considerations that sleep does not consist in the inactivity of the perceptual modalities, in our not employing them, and also not in not being able to perceive. For something of this sort also happens in cases of fainting; for a faint is an incapacity of perception, and there are also states of unconsciousness of this sort. Further, those whose blood vessels in the neck are squeezed become insensible. But rather [sleep occurs] whenever the incapacity of its employment takes place neither in a random perceptual organ nor due to a random cause, but, as has just been said, in the primary perceptual one with which one perceives all things. For whenever this is incapacitated, it is necessary for all the perceptual organs to be incapable of perceiving too, but whenever one of these is incapable, it is not necessary for the primary perceptual one to be so.

Due to what cause sleeping comes about, and what sort of affection it is, must now be stated. For we call the for-the-sake-of-which, the starting-point from which the movement arises, the matter, and the account a "cause."

First, then, since we say that nature acts for the sake of something, and this is some good, and rest is necessary and beneficial for every creature that is by nature moved and not capable of moving always and continuously with pleasure, and since people, due to the truth itself, apply to sleep the metaphor of being a "rest," it follows that it exists for the sake of the preservation of the animals. Waking, though, is the end. For perceiving and thinking are the end for all that possess either of them. For they are the best, and the end is what is best. That sleep of necessity belongs to each of the animals is clear. I mean, hypothetical necessity,[4] because if there is going to be an animal that possesses its own nature, of necessity certain things must belong to it, and if these things belong, other things must belong.

Further, which sort of movement and action occurring in their bodies produces waking and sleeping in animals must next be discussed. We must suppose, then, that their causes in other animals are just like (either the same or analogous) the ones in the blooded animals, and in the blooded animals just like in the human beings, so that it is on the basis of the latter that we must get a theoretical grasp on all of them.[5]

4. *PA* 639b19–640a8.
5. *HA* 491a19–23.

That the starting-point of perception is from the same part from which the movement also arises has been determined earlier elsewhere.[6] And of the three places that **456ᵃ1**
have been distinguished this is the one in the middle between the head and the lower stomach. In blooded animals this is the part around the heart. For all blooded animals have a heart, and the starting-point of movement and of the controlling 5
perception is located there.

As for movement, it is evident that the starting-point of breath and, in general, that of cooling is located there, and that it is with a view to preserving the heat residing in this part that nature has provided beings that breathe and cool themselves by means of liquid. But we will speak about this by itself later on.[7] 10

In bloodless animals, insects, and those that do not take in breath, it is in the analogous part that their innate breath is observed puffing up and sinking down. This is also clear in the case of the whole-winged insects, such as wasps and bees, and in flies and other animals of this sort. And since it is impossible to move anything or to produce anything without strength, and what produces strength is the holding of one's 15
breath—in the case of those animals that breathe in, this is the holding of the breath from outside, while in the case of animals that do not breathe, it is the holding of the innate breath (that is also why the winged insects are observed to buzz when they move because of the breath rubbing against the diaphragm of the whole-winged insects), and all animals move themselves as a consequence of some perception, either proper or 20
alien,[8] in the primary perceptual organ—then, if sleep and waking are affections of this part, it is evident in which place and in which part sleep and waking primarily occur.

Some people, though, move while they are sleeping and do many things that are characteristic of wakefulness,[9] but they do not do this without an appearance and a sort of perception. For a dream is in a way a perceptual affection. But we must speak about 25
this later on.[10] Why these people remember their dreams when they are awake, but do not remember the actions characteristic of wakefulness, has been stated in the *Problems*.[11]

3
The Efficient Cause of Sleep

Next after what has been said it is to discuss in what sorts of circumstances and from 30
what source the affection of waking and sleeping arises. It is evident, then, that since it is necessary for the animal, as soon as it has perception, to first take in nourishment

6. *PA* 665ᵃ10–15, 666ᵃ11–13 mention this fact, but 647ᵃ24–27 and 656ᵃ27–30 seem to refer to the present discussion.
7. *Juv*. 14, 19.
8. I.e., internal or external.
9. *GA* 779ᵃ16–19.
10. *Insomn*. 3.
11. Not in the extant †*Pr*.

and to grow, and the last stage of the nourishment for all blooded animals is the nature of the blood, and its analog for the bloodless animals, and the place of the **456ᵇ1** blood is the blood vessels, and the starting-point of them is the heart (what we say is evident from the *Dissections*)—thus, while the nourishment from outside arrives in the places that are receptive of it, the vapor arising from it gets into the blood vessels, and there it undergoes a change, turns into blood, and proceeds toward its starting-point.

We have spoken about these things in *On Nourishment*.[12] But now we must take them up again for the sake of getting a theoretical grasp on the starting-points of the movement and how the perceptual part is affected when waking and sleeping occur. For sleep is not any random sort of incapacity of the perceptual part, as was said.[13] For unconsciousness, a sort of choking, and fainting also produce some such incapacity. In fact, to some people an appearance has even occurred during a deep faint.

But this involves a certain puzzle. For if it is possible that someone who has fainted has fallen asleep, it is possible that the appearance is a dream. And there are many things that those in a deep faint and who are believed to have died report, about all of which one must suppose that the same account holds. However, as we have said, sleep is not every incapacity of the perceptual part, but this affection comes about from the exhalation that rises in connection with nourishment. For the product of the exhalation is necessarily pushed up to a certain point, and then it must turn and change its course like the tide in a narrow strait. And the hot material of each of the animals is naturally carried upward. But when it reaches the upper places, it turns back in a mass and is carried downward. That is why fits of sleepiness start most often after nourishment. For much of the wet and corporeal material is carried upward in a mass. When, then, it comes to a stop, it weighs one down and makes one doze off. And when it turns, sinks downward, and pushes away the hot material, then sleep comes about and the animal sleeps.

The things that induce sleep are also a sign of this; for they all make the head heavy, both the drinkable and the eatable ones—poppy, mandrake root, wine, and darnel. And people who are weighed down [by sleep] and doze off seem to be affected in this way, and they are incapable of lifting their heads and their eyelids. And it is most of all after eating food that sleep is of this sort. For after meals there is a large quantity of exhalation from the food. Further, it comes from certain sorts of fatigue. For fatigue has a liquifying effect, and the product of that liquification, unless it is cold, acts like unconcocted nourishment. Also, some diseases produce the same **457ª1** effect, namely, all those that originate from a wet and hot residue, as it happens, for example, in those who have a fever or are lethargic.

Further, early childhood. For infants sleep a lot because the whole nourishment is carried upward. A sign of this is that the size of the upper parts exceeds that of the

12. Cf. *PA* 650ᵇ8–11.
13. 455ᵇ2–13.

lower parts during early childhood, because growth goes in that direction. Due to the same cause they are also prone to epilepsy. For sleep is similar to epilepsy and is in a way a sort of epilepsy. That is also why the starting-point of that affection occurs to some people while they are asleep, and they have seizures while sleeping, but not while awake; for when a large quantity of breath is carried upward, when it comes down again it makes the blood vessels swell and compresses the ducts through which breathing takes place. That is why wines are not advantageous to small children, nor to their wet nurses (for presumably it makes no difference whether they drink it themselves or their wet nurses do); on the contrary, they should drink them mixed with water and in small quantities; for wine is breath-like, in particular dark wine. The upper parts are so full of nourishment in small children that they do not turn their neck for five months; for just as in the very drunk a large quantity of liquid is carried upward. And it is reasonable that this affection is also the cause of the fetuses remaining at rest in their mother's uterus at first.

Also, in general, those who have inconspicuous blood vessels are prone to sleeping and also those who are dwarf-like or have large heads; for the blood vessels of the former are narrow, so that it is not easy for the liquid to flow downward, while in dwarf-like people and in those with large heads the upward impulse of the exhalation is great. Those who have large blood vessels, however, are not prone to sleeping, because of the free passage their vessels allow, unless they have some other contrary affection.

Nor are impulsive people (*melagcholikoi*) prone to sleep; for their inner place has been cooled down, so that no large quantity of exhalation comes about in them. That is also why they are voracious eaters though they are thin; for their bodies are so disposed as not to receive any benefit from it. And the black bile (*melaina cholê*), since it is cold by nature, also makes the nutritive place and the other parts of the body cold, wherever this sort of residue is potentially present.

So it is evident from what was said that sleep is a sort of assembling of the hot in the inward direction and a natural reciprocal replacement [of hot with cold material] due to the cause that was stated.[14] That is why there is a lot of movement in a sleeping person. And the place where the heat leaves from grows cold and, on account of the cooling, the eyelids fall close, and the upper and external parts grow cold, while the internal and lower parts are hot—for example, the parts around the feet and the internal parts. **457b1**

And yet one might raise a puzzle about the fact that sleep is deepest after meals, and that wine and other such things that possess heat are sleep-inducing, though it does not make good sense that sleep should be a process of cooling, while the causes of sleeping are hot.

Does this, then, happen because just as the stomach is hot when empty, and the filling cools it down because of the movement, so too the ducts and places in the head are cooled down when the exhalation is moving upward? Or is it that just as people

14. 456b17–28.

who have hot material poured over them shiver immediately, so too here when the heat moves upward the cold gathers together, cools down, and makes what is hot by nature lose its power and withdraw?

Further, when a large quantity of nourishment comes in, which the heat draws upward, it—like a fire when logs are placed on it—cools down, until it has been concocted. For, as was said,[15] sleep comes about when the corporeal exhalation is carried upward by the heat through the blood vessels in the direction of the head. And when what has been drawn upward cannot keep going upward, but is excessive in quantity, it is pushed back again and flows downward. That is also why human beings fall down when the heat raising them up is withdrawn from under them; for the human being alone among the animals stands upright. And when it befalls them it first produces a loss of consciousness, and later an appearance.

Or is it rather that, while the resolutions of the puzzles given just now are possible explanations for the coming about of the cooling process, nonetheless it is the place that is really in control, as has been stated elsewhere,[16] and the brain is the coldest of all the parts of the body, and for those animals that do not possess a brain it is the analog? Just as the moisture, then, that evaporates due to the heat of the sun, when it comes to the upper region is cooled down due to its coldness, and having been condensed is carried down once it has become water again, in that same way during the rise of the heat toward the brain the exhalation from the residue gets composed into phlegm[17] (which is also why mucus is observed to arise from the head), and the nutritive and non-diseased exhalation is carried downward after it gets composed and cools the heat. The thinness and narrowness of the blood vessels around the brain contributes to its cooling and not easily receiving the exhalation. This, then, is the cause of the cooling, despite the fact that the exhalation is exceedingly hot.

One wakes up, though, whenever [the nourishment] has been concocted and a large quantity of heat, after having been forced together from the surroundings into a small space, gets the upper hand and the more corporeal blood has been disaggregated from the purer blood. And the finest-grained and purest blood is in the head, while the coarsest-grained and thickest is in the lower parts. But the starting-point of all blood, as has been stated both here and elsewhere,[18] is the heart.

Of the cavities of the heart, the one in the middle is common to each of the other two, and each of them receives [its blood] from each of the two blood vessels, the so-called great vessel and the aorta, while the disaggregation takes place in the middle cavity. But to make determinations about these issues more properly belongs to other accounts.[19] Sleep occurs because the blood becomes more disaggregated after the intake of nourishment, until the purer blood is disaggregated into the upper places

15. 456ᵇ20–24.
16. *Sens.* 444ᵃ10–15, *PA* 652ᵃ24–653ᵇ8.
17. *GA* 725ᵃ15–16.
18. 456ᵇ5, *HA* 521ᵃ9–10, *PA* 647ᵇ4–7, 665ᵇ9–17, 666ᵃ5–11.
19. *HA* 494ᵃ4–ᵇ11, *PA* 3.4–5.

and the thicker blood into the lower places. And whenever this happens, once they have been released from the weight of the nourishment, animals wake up.

What the cause of sleeping is, then, has been stated,[20] namely, that it is the reciprocal replacement [of hot with cold material] due to the corporeal exhalation being carried upward by the innate heat acting all at once upon the primary perceptual organ; and it has also been stated what sleep is, namely, that it is a seizure of the primary perceptual organ that renders it incapable of being active, occurring of necessity (for it is not possible for an animal to exist if the things that bring it to completion do not come about), and is for the sake of preservation; for rest preserves.

20. 457[b]1–2.

ON DREAMS*

De Insomnis

1
To Which Part of the Soul Does Dreaming Belong?

Next we must inquire about the dream, and, first, to which of the parts of the soul it appears to belong, that is, whether this affection belongs to the understanding part or to the perceptual one; for it is only by way of these capacities in us that we know things. **458ᵇ1**

Since the use of sight is seeing, and that of hearing is hearing, and, in general, that of perception is perceiving, and since there are objects that are common to the perceptual modalities, such as shape, magnitude, and the others of this sort,[1] and since all animals are incapable of seeing when their eyes are closed and while asleep, and similarly also with the other perceptual modalities, it is clear that we do not perceive anything during sleep. Therefore, it is not with perception, at any rate, that we perceive dreams.

But neither is it with belief; for [in belief] we assert not only that the approaching thing is a human being or a horse but also that it is white or beautiful—things of which belief could not assert anything, either truly or falsely, without perception. But in sleep it happens that the soul does this, for [in a dream] we equally believe that we see that the approaching thing is a man and that it is white.

Further, alongside a dream we think something else, just as we do in waking when we perceive something. For often we also think something about what we are perceiving; and in this same way in sleep too we sometimes think other things alongside the [dream] appearances. This should become evident to anyone who directs his thought [to a dream] and tries to remember it on arising. In fact, some people have seen dreams of this sort—for example, those who [while dreaming] believe that they can arrange the things presented to them in accord with a mnemonic precept. For it happens to them that they put some other appearance in that place before their minds alongside the dream one. It is clear, then, that not every appearance in sleep is a dream, and that what we think is something we believe by the capacity of belief.

From all these considerations this much at least is clear, that the same [part] by which we are deceived when awake and sick is also the one that produces the affection during sleep. Even to those who are healthy and who know [that it is not the case]

* Translated by Klaus Corcilius. Text: As for *De Sensu*.

1. Accepting the seclusion of ἢ τὰ ἴδια οἷον χρῶμα ψόφος χυμός ("or the special objects such as color, sound, flavor").

the sun still seems to be a foot across. But whether the imaginative part of the soul is the same as, or distinct from, the perceptual part, nonetheless [dreaming] will not occur without seeing or perceiving something. For to mis-see or to mis-hear involves seeing and hearing something true, though it is not what the person thinks. But it is assumed that in sleep one neither sees, nor hears, nor perceives anything at all. Is it true, then, that one sees nothing, but not true that perception is not at all affected, and that instead it is possible that sight undergoes a certain affection, and also the other perceptual modalities, and that each of them somehow impinges on perception, just as when one is awake, but not in the same way as when one is awake? And sometimes the belief says that it is false, as in people who are awake, while at other times it is held back and follows along with the appearance.

That this affection we call "dreaming," then, does not belong either to the part that forms beliefs nor to the thinking part is evident. But nor does it belong simply to the perceptual part, for then it would simply be seeing or hearing. But how and in which way [it does so], then, must be investigated.

Let it be assumed, the precise thing that is also evident, that it is an affection of the perceptual part, if indeed sleep is too. For it is not the case that sleep belongs to one sort of animal and dreaming to another, rather, they belong to the same one. But since we have spoken about imagination in the *De Anima*,[2] and since the imaginative part is the same as the perceptual part, though the being for imagination and the being for perception are distinct, and since imagination is a movement occurring due to active perception, and since a dream seems to be a sort of appearance (for we call an appearance during sleep a "dream," either unconditionally or one that comes about in a certain way), it is evident that dreaming belongs to the perceptual part, but that it belongs to it insofar as it is imaginative.

2
The Subject of Dreaming

We will be best able to get a theoretical grasp on what a dream is, and how it comes about, from what happens in connection with it. For the perceptual objects corresponding to each perceptual organ produce perception in us, and the affection that results from them is present in the perceptual organs not only when the perceptual modalities are active, but also after the perceptual objects have gone away. In such cases the affection seems to be much the same as in the case of things in spatial movement. For in the case of things in spatial movement too, the movement continues even though there is no longer contact with what moved them; for the mover moved a certain portion of air, and this, since it was moved, in turn moved another portion; and in this way, then, movement in both air and in liquids is produced, until it comes

2. 3.3.

to a stop. Likewise, one must suppose this to be so in the case of alteration too. For **459^{b}1**
what is heated by something hot heats what is next to it, and this passes it on until
it reaches the starting-point. So it is necessary that this also happens in perceiving,
since active perception is a sort of alteration. That is why the affection is not only in
the perceptual organs while they are perceiving, but also when they have ceased to do
so, and this both deep inside and on the surface.[3]

This is evident whenever we perceive something continuously. For when we shift
our perception, for example, from the sun to darkness, the affection follows along
with it; for it then happens that we see nothing because of the movement due to the
light still subsisting in our eyes. And if we look at one color, whether white or green,
for a long time, whatever we turn our sight to next appears to be of that same color.
And if, after having looked into the sun or into some other bright object, we close
our eyes, if we watch closely, the object appears right in front of us wherever our
sight happens to look, at first in the same color, then it changes to crimson, next to
purple, until it comes to black and disappears. Also, to those who turn their eyes away
from moving things, such as rivers, and especially from those that flow fastest, the
things that are at rest appear to be moving. Again, people also become deaf from loud
sounds, and from strong odors they become bad at smelling similar objects. These
things manifestly take place in the way we say.

A sign that the perceptual organs quickly perceive even slight differences is what
happens in the case of [bronze] mirrors, which, even when attended to by itself, is
something one might investigate and raise puzzles about. At the same time, it is clear
from this that just as the organ of sight is affected it also produces an effect. For when
menstruating women look into the mirror, in the case of extremely clean mirrors, the
surface of the mirror becomes like a bloody cloud; and if the mirror is new, it is not
easy to remove this sort of stain, but if it is old, it is easier. The cause, as we said, is
that the organ of sight is not only affected by the air but also produces an effect and **460^{a}1**
causes movement, just as bright objects also do; for the organ of sight is a bright and
colored object too.

It makes good sense, then, that the eyes during menstruation are in a condition
just like any other part of the body; for by nature they are full of blood vessels. That
is why when menstruation occurs, due to the disturbance and bloody inflammation,
the resulting difference in the eyes is not clear to us, but is still present (for seed and
menstrual fluid have the same nature),[4] and the air is moved by them, and it makes
the air on the mirror, which is continuous with it, have a certain quality, that is, the
same one it itself is affected by, and the air does the same to the surface of the mirror.

Just as with garments, the cleanest mirrors are the quickest to get stained. For
what is clean shows exactly whatever it receives, and what is so to the highest degree
shows the smallest movements. But bronze, because it is smooth, best perceives any

3. *Somn.* 456^{a}20–21.
4. I.e., they are involved in the transmission of form, in the present case that of color.

contact (one must understand the contact of the air as a sort of friction and, as it were, a wiping and washing), and because it is clean, contact of whatever intensity is manifest. And cause due to which the stains do not easily go away from new mirrors is that they are clean and smooth. For the stain penetrates such things both in depth and all over; in depth because of the cleanness, all over because of the smoothness. But the stain does not remain on the old mirrors because it does not penetrate in the same way but is more superficial.

That movement is also produced due to slight differences, then, and that perception is quick, and that the perceptual organ of colors is not only affected, but also produces an effect in return, is evident from these considerations. Evidence for what has been said is provided by the things that happen with wine and in the manufacture of perfumes. For the oil, once prepared, quickly takes on the smell of the objects next to it, and the wine does too. For they take on not only the smells of what is thrown into them or mixed with them, but also those of the things that are placed next to the vessels that contain them, or that grow there.

But in relation to the question at the start let one thing be assumed, which is
460b1 precisely what is evident from what has been said, that even when the external perceptual object has gone the perceptual affections remain and are themselves perceptual objects; and in addition that we are easily deceived when we are in the grip of feelings, and distinct people in distinct ones—for example, the coward when in the grip of fear, and the lover when in the grip of love, so that from a slight similarity the one believes he see his enemies, and the other his beloved. And the more in the grip of a feeling he is, the smaller the similarity due to which things appear so. And in the same way all people become easy to deceive when in the grip of anger and all sorts of appetites, and the more so, the more they are in the grip of the feelings. That is also why to those in a fever sometimes animals appear on the walls due to a slight similarity in the composition of the lines there. And these appearances sometimes agree in intensity with the feelings in such a way that when they are not very ill it does not escape their notice that it is false, but when the affection is more severe, they even move themselves in connection with these.

The cause of these occurrences is that it is not in virtue of the same capacity that the controlling part judges and that the images come about. A sign of this is that the sun appears a foot across, but often something else speaks against the appearance. And when the fingers are crossed, one object [placed between them] appears to be two [to touch]; but we nonetheless deny that it is two; for another [perceptual modality] is more controlling than touch, namely, sight. But if there was only touch, we would also have judged the one object to be two. The cause of our being deceived is that things of any sort whatever appear not only when the object of perception causes movement, but also when perception itself is moved as if due to a perceptual object. I mean, for example, that the earth seems to be moving to those who sail, though their sight is moved by something else.

3
The Efficient Cause of Dreaming

From these considerations, then, it is evident that the movements from the perceptual affections, coming both from the outside and from the body itself, do not occur only in waking people, but also when this affection called "sleep" occurs, and then they even appear to occur more. For during daytime these movements are knocked out since the perceptual modalities and thought are active, and they vanish just as a smaller fire vanishes next to a big one and small pleasures and pains next to great ones, but when these stop, the small [movements] surface too. But at night—because of the idleness of the particular perceptual modalities and their incapacity to be active, due to the backflow of the heat from the external parts to the inner parts of the body—the movements are carried down to the starting-point of perception[5] and become apparent when the disturbance has settled.

We must suppose, then, that, just as little eddies are carried along in rivers, so each [such] movement occurs continuously, often remaining the same, but often dissolving into other shapes because of striking against something. That is why dreams do not occur after meals or to those who are altogether young, such as small children. For there is a great deal of movement due to the heat from the nourishment. So, just as in a liquid, if there is violent movement, sometimes no reflected image appears, while at other times it does appear, but is altogether distorted, so that it appears other than what it is, but once the movement has come to a rest, the reflected images are clear and evident, in this same way during sleep too the appearances—that is, the remaining movements that come about from the perceptual affections—sometimes, by a movement greater than the mentioned one, vanish altogether, while sometimes the visions appear confused and monstrous, and the dreams are incoherent as in impulsive people and in those who are feverish or drunk. For all affections of this sort, since they are breath-like, cause much movement and disturbance.

When the blood in blooded animals calms down and gets disaggregated, the movement from each of the perceptual affections, when preserved, makes the dreams coherent, and so something appears, and because of the movements that are carried down from the eyes [to the heart], the dreaming person believes he sees, and because of the movements [carried down] from the ear he believes he hears, and in a similar manner too with the movements from the other perceptual organs. For it is due to the movement arriving from there at the starting-point [of perception] that the waking person too believes that he sees and perceives, and sometimes we say we see because the organ of sight seems to be moved, even though it is not. Also, one thing seems to be two because touch reports two movements. For, in general, the starting-point affirms what comes from each perceptual modality, unless some other more controlling capacity speaks against it. And in every case there is something that

5. *Somn.* 456ᵃ4–6.

appears, but one does not believe what appears in every case, unless the judging one[6] is held back or is not moved with its own movement.

And in the way we said[7] that distinct people are easily deceived by distinct affections, so also the sleeping person, because of sleep, the movement of the perceptual organs, and the other things that happen regarding perception, so that something that has only a slight similarity to it appears to be the actual thing. For when one sleeps, since most of the blood moves downward toward the starting-point, the movements that are present in it, some potential and some others active, move down with it. The movements are so related that if anything moves the blood, this movement will rise to the surface from it, and when this one passes away, another [will too]. And they are related to each other just like the fabricated frogs[8] that come up in water as the salt melts. This is the way they are potentially present [in the blood], and they become active when the hindrance has slackened, and, on being let loose in the little remaining blood that is moved in the perceptual organs, they bear resemblances just like clouds do, which people liken to human beings and to Centaurs as they rapidly change.

Each of these, as was said,[9] is a remnant of the active perceptual affection. And they are present even when the true one has gone away, and it is true to say that this is like Coriscus but is not Coriscus. And when it was perceiving, the controlling and judging capacity did not say that [the affection] is Coriscus, but rather it said because of it that that true one is Coriscus. The same capacity, then, with which one says this during perception, unless it is entirely held back by the blood, is now moved by the movements in the perceptual organs as if it was perceiving, and what is similar [to a thing] seems to be the actual thing itself. And the capacity of sleep is such as to make this escape one's notice.

Hence, it is just like if someone is unaware that a finger is been pressed under his eyeball,[10] it will not only appear to him, but he will also believe, that what is one thing is two, while when he is not unaware of this, it will appear so to him, but he will not believe it. So too during sleep, when someone perceives that he sleeps (that is, he perceives the affection in which the perceptual capacity of the sleeper finds itself), something appears to him, but something in him says that though it appears to be Coriscus, it is not Coriscus (for often during sleep something in the soul says that what appears is a dream); but when he is unaware that he sleeps, nothing will speak against the appearance.

That we are speaking the truth and that there are movements capable of producing appearances in the perceptual organs is clear, if one directs one's attention to

6. 460ᵇ16–18.
7. 460ᵇ3–7.
8. These were evidently stacked on top of each other and so weighed down with a covering of salt that one surfaced after another.
9. 460ᵇ2–3.
10. *Met.* 1063ᵃ6–10.

it and tries to remember how we are affected when we fall into sleep and when we wake up. For sometimes, in the moment of awakening, one will discover the images that appear during sleep as being movements in the perceptual organs. For to some younger people, even when they open their eyes altogether wide during darkness, there appear many moving images, so that they often cover up their heads in fear.

From all these considerations, then, one must deduce that a dream is a sort of image and that it occurs during sleep. For the appearances just mentioned are not dreams, nor is anything else that appears while the perceptual modalities are released [from sleep]; nor is every appearance in sleep a dream. For, first, it happens to some people that they somehow perceive sounds, light, flavor, and touch, but weakly and as if from afar. For in fact there have been people that blink while they sleep who dimly saw the light of a lamp during sleep, as they thought, and immediately after waking recognized it as the light of the real lamp, and also those that have dimly heard the voice of cocks and dogs that they recognized perspicuously upon awaking. Some people even reply to questions put to them [while they are asleep]. For it is possible in the case of waking and sleeping that, while one of them is present unconditionally, the other be present in a way. None of these must be said to be a dream, nor must any of the true things understood that occur in sleep alongside the appearances,[11] but rather the appearance due to the movement from the perceptual affections, when it occurs during sleep, and insofar as one is sleeping—this is a dream.

But cases have been observed of people who have never seen a dream in their whole lives, while others have seen a dream only at an advanced age having never dreamed before.[12] The cause of their not having dreams appears to be much the same as the case of young children and what happens after meals.[13] For it is reasonable that no appearance appears to all those whose nature is composed in such a way as to have much exhalation moving upward to the upper place, which, when it descends, produces a great quantity of movement. But with older age it is not at all strange if a dream appears to them. For when a change has taken place either in virtue of age or in virtue of an affection, this contrary condition necessarily results.

11. 458^{b}15.
12. Cf. *HA* 537^{b}16–20.
13. *Somn.* 456^{b}32–457^{a}5.

ON PROPHECY DURING SLEEP*

De Divinatione per Somnum

1
Is Prophecy during Sleep Possible?

As regards the prophecy that occurs during sleep and that is said to come about from dreams, neither to despise it nor to be persuaded by it is easy. For the fact that all or many people suppose that dreams have something significant about them is a persuasive factor, since it is something said on the basis of experience; also, that in some cases there is prophecy in dreams is not unpersuasive; for there is some reason for it. That is also why one might think in a similar way about the other dreams too. On the other hand, to see no reasonable cause due to which it might come about, makes one not be persuaded. For to hold both that the god is the one who sends [prophetic dreams], and that he sends them not to the best and wisest people but to random ones, is—in addition to its other inconsistencies—absurd. But once causation from the god has been excluded, none of the other causes seems reasonable either. For it would seem beyond our comprehension to discover the starting-point from which some people foresee events at the Pillars of Heracles or on the banks of the Borysthenes.

Necessarily, then, dreams are either causes or signs of events, or else they are coincidental concomitants, and they are either all or some of these, or only one. By "cause" I mean, for example, as the moon is of the eclipse of the sun, and fatigue of the fever; by "sign" as the entrance of a star[1] into the shadow is of the eclipse, and as the roughness of the tongue is of the fever; and by "coincidental concomitant" that someone is walking when the sun is eclipsed; for this is neither a sign of the eclipse nor a cause, and neither is the eclipse of the walking. That is why none of the coincidental concomitants occurs always or for the most part. **463ª1**

Is it, then, that some of the dreams are causes and signs, as for example of the things that occur in the body? At any rate, even the more sophisticated of the doctors[2] say that one must pay attention to dreams. And it is reasonable for those who, though not practitioners of the craft, are investigating [the issue] and philosophizing about it, to suppose so as well. For the movements that occur during daytime, unless they are very great and strong, escape notice alongside the larger waking movements. During sleep the opposite is the case, however, for even the small movements seem to be

* Translated by Klaus Corcilius. Text: As for *De Sensu*.

1. Probably the appearance of a star when the sky is darkened by a solar eclipse.

2. *Sens.* 436ª19–ᵇ1, *Juv.* 480ᵇ26–30.

great. This is clear in the case of what often happens during sleep. For then people think that there is thunder and lightning while there are faint sounds in their ears, that they are enjoying honey and sweet flavors when a droplet of phlegm runs down their throat, or that they are walking through fire and feeling intense heat when there is a slight heating in some parts of their bodies. But once they are awake, it is evident the way things are. So, since the starting-points of all things are small, it is clear that this holds also for illnesses and other affections that are about to occur in the body. It is evident, then, that these things are necessarily more manifest during sleep than during waking.

Moreover, it is not unreasonable that at least some of the appearances that occur during sleep are causes of the actions corresponding to each of them. For, just as when we are about to act, or are engaged in doing actions, or have already done them, often, in a vivid dream, we find ourselves concerned with these actions and even performing them, in that same way it is conversely necessary that the movements that occur during sleep are also often starting-points of our daytime actions, because our thinking has conversely paved their way in the appearances that occurred during the night. In this way, then, it is possible that some dreams be both signs and causes.

However, many dreams seem most of all like coincidental concomitants, and in
463b1 particular all the extravagant ones, that is, those whose starting-point is not in the dreamers themselves, but instead are about a naval battle and things that happen far away. For regarding these dreams, it is likely that the same thing happens as in the case of those who have remembered something, and this very thing comes to pass. For what prevents this from happening in dreams as well? Rather, it is likely that many things of that sort happen. Just as remembering this person, then, is neither a sign nor a cause of his presence, so also in this case the fact that the thing happens after the dream is for the person who saw it neither a sign nor a cause, but a coincidental concomitant. That is why many dreams do not become true. For coincidental concomitants do not occur either always or for the most part.

2
The Explanations

In general, though, since some of the other animals dream as well, dreams would not seem to be sent by a god, nor do they occur for that purpose; they are, however, daimonic, for nature is daimonic, but not divine.[3] There is a sign of this, for completely worthless people are capable of foresight and of dreaming vivid dreams, implying that it is not a god that sends them; but rather that people with a garrulous and impulsive sort of nature see visions of all sorts; for they, because they undergo many movements in all sorts of ways, chance to have visions similar to actual events since they are lucky

3. *Somn.* 453b20–24.

in this, just like some people who play at odd or even; for, as the saying goes, "if you make many throws your luck must change," which holds in their case as well.

That many dreams do not come true is nothing strange. For it is also not the case that many signs in the body or in the sky, such as those of rains or winds (but still if another movement occurs that has more control than this one due to which it was a sign of a future event, the event does not occur), and many of things that should be done, even though deliberated about correctly, are canceled because of other more controlling starting-points. For, in general, not everything that was going to happen occurs, nor is what will be the same as what is going to happen;[4] but still it must be said that some of these are starting-points due to which nothing was accomplished, and these are natural signs of events that did not occur.

But as regards the dreams we have spoken of[5] that have no such starting-points but are outlandish in time, in place, or in magnitude, or that are outlandish in none **464^{a}1** of these ways, yet do not have their starting-points in the people themselves who see the dream, provided their foreseeing does not happen due to a coincidental concomitance, the following would be better than to say, as Democritus[6] does, that images and effluences are the causes. For just as when something causes movement in water or air, this causes movement in something else, and when the first cause has ceased, it happens that a similar movement continues up to a certain point, even though the first mover is not present, in this same way nothing prevents a certain movement and perception from arriving at dreaming souls (coming from the things Democritus makes the images and effluences come from); and wherever they happen to arrive, they are more perceptible at night because movements that are carried along during daytime are more liable to dissolution (for the air is less disturbed at night because nights are less windy), and they produce perception in the body because of sleep, because sleeping people perceive even small internal movements more than those who are awake. And these movements produce appearances, from which people foresee what is going to happen even as regards things of this sort.[7]

That is also why this affection occurs to random people and not to the wisest ones. For during daytime it would also occur in the wise ones, if a god was the sender. But in this way[8] it is reasonable that random people have foresight. For the thought of these people is not busy with thoughts but rather, as it were, deserted and empty of all things, and once moved it darts in accord with what moves it. The cause of some excitable people's having foresight is that their own movements do not disturb but rather pave the way [for the incoming movements]; hence they especially perceive alien movements.

4. *GC* 337^{b}4–7.
5. 463^{a}31–^{b}11.
6. A77 DK.
7. I.e., outlandish ones.
8. I.e., as it has just been explained.

That some people have vivid dreams, for example, that people who know each other have foresight especially with respect to the ones they know, happens because people who know each other care about each other most. For just as they very quickly
30 know and perceive each other from far away, so they also perceive each other's movements; for the movements of the ones they know are more familiar. And impulsive people, because of their vehemence, as if they were throwing from afar, are good at hitting the mark, and because of their changeability, what comes next appears to
464b1 them quickly. For just as even mad people recite and think in their minds the poems of Philaigis, which are connected by similarity like "Aphrodite" and "phrodite," in this same way also impulsive people go on stringing things together. Further, due to their vehemence their movements are not knocked out by other movements.

5 The most craftsman-like judge of dreams is the one capable of observing resemblances (for anybody can judge vivid dreams). I say "resemblances," because what happens in the case of appearances is much the same as happens to images in water, as
10 we also said previously.[9] But there, when the movement becomes great, the reflection and the images bear no resemblance at all to the real objects. Truly clever at judging the appearances would be the person capable of quickly and distinctly perceiving and immediately comprehending the scattered and distorted fragments of these images, namely, that it is the reflection of a human being, or of a horse, or of whatever else—
15 it is the same, then, in the case of seeing what this dream means; for the internal movement knocks out the vividness of the dream.

What sleep is, then, and what dreaming is, and due to what cause each of them comes about, and, further, about all the prophecy that comes from dreams has been stated.

9. *Insomn*. 461a14–25.

ON LENGTH AND SHORTNESS OF LIFE*

De Longitudine et Brevitate Vitae

1
Puzzles about Longevity

As regards the fact that some animals are long-lived, others short-lived, and as regards length and shortness of life in general, the causes must be investigated. And the necessary starting-point of this investigation is to go first through the puzzles about these things. For it is not evident whether the cause of some being long-lived, others short-lived, is a distinct one or the same for all animals and plants. For some plants too last [only] one year while others live longer. A further puzzle is whether among the things that are naturally composed the same ones are long-lived and healthy in their nature, or whether being short-lived and being sick are separate [affections], or for some illnesses the bodies that are ill in their nature coincide with those that are short-lived, while in other cases nothing prevents those that suffer from an illness from being long-lived.

Sleep and waking were spoken about previously, and life and death must be spoken about later, and likewise illness and health, to the extent that they pertain to natural philosophy; now, though, we must get a theoretical grasp on the causes of some things being long-lived, others short-lived, as was said previously.[1] Whole **465ª1**
kinds have this difference with respect to whole kinds, and also individuals that fall under one form differ from one another [in this way]. By "different according to kind" I mean the human being with respect to the horse (for human beings as a kind live longer than horses), and [by "different] according to form," a human being with respect to another human being. For some human beings are long-lived, others short-lived, because they are set apart by the distinct places in which they live. The nations who live in hot places are longer-lived, while those who live in cold places are shorter-lived. Even among those who live in the same place, some are different in a similar way with respect to this difference from each other.

* Translated by Andrea Falcon. Text: W. D. Ross, *Aristotle: Parva Naturalia* (Oxford, 1955).

1. 465ª19–20. The order of treatises suggested is *Somn.* (including *Insomn.* and *Div. Somn.*), *Long., Juv*. A study of the starting-points of health and illness is announced also in *Sens.* 1 but nothing by Aristotle on it survives.

2
Modes of Destruction

One must grasp, then, what it is in naturally constituted things that makes them easy to destroy, and what it is that makes them not easy to destroy. For fire, water, and the things that are akin to them, although they do not have the same capacity, are the cause of coming to be and passing away for each other, so that it is reasonable that all the other things that come from these and are composed out of them partake of their nature, except for those that, like a house, are a combination of many things.

As regards the other things, then, there is a different account; for there are modes of passing away that are special to many beings—for example, to scientific knowledge and ignorance, health and disease. These things pass away even if the things that are receptive of them do not pass away but are instead preserved—for example, recollection and learning are a passing away of ignorance, and forgetting and error of scientific knowledge. But the passing away of these other things follows coincidentally on the passing away of the natural ones; for when animals pass away, the scientific knowledge and health in the animals also pass away. That is why, as regards the soul too, one might draw a conclusion; for if it is not by nature but rather in just the way scientific knowledge is in a soul that the soul is likewise in a body, there should be another mode of passing away that is special to the soul beyond the passing away that it undergoes when the body passes away. So, since there is manifestly no such mode, the soul must have its communion with the body in a different way.

3
A Puzzle

465b1 But perhaps someone might reasonably raise a puzzle as to whether there is a place where what admits of passing away becomes incapable of passing away, as fire does in the upper place where there is no contrary. For what belongs to contraries coincidentally passes away because the contraries pass away; for contraries do away with each other. But none of the contraries that are in substances passes away coincidentally because a substance is not predicated of any subject.[2] So it would be impossible for what has no contrary, or is in a place where there is none, to pass away. For what will be the cause of its passing away, if indeed its passing away only comes about due to contraries, while a contrary either does not exist altogether or does not exist in that place?

Or is this true in one way and not true in another? For it is impossible for a contrary not to belong in some way to what has matter.[3] For it is possible for the hot

2. *Cat.* 5.
3. I.e., not to belong potentially to what has matter.

or the straight to be present in every thing, but it is impossible for the whole thing to be either hot or straight or white; for then the affections would be separate. If, then, what can affect and what can be affected are simultaneous, it is always the case that one affects and the other is affected, and it is impossible for there to be no change. Further, [this is so] even if it is necessary for a residue to be produced, and the residue is a contrary; for change is always from a contrary, and the residue is a leftover of the previous contrary.

But if what is actively a contrary is driven out as a whole, would at that point the thing become incapable of passing away? Or is this not so, but rather the thing would pass away due to the environment? If it is, then what has been said is enough; but if it is not, it must be assumed that something that is actively a contrary is present and that a residue is produced. That is why a smaller flame is accidentally burned up by a greater one, because the nourishment that the smaller flame uses up in a greater time, which is the smoke, the greater flame uses up quickly.[4] That is [also] why everything is always in movement, that is, coming to be or passing away. The environment, for its part, acts either in a co-operative or in an opposite way, and because of this the things that change their place come to be longer-lived or shorter-lived than their nature warrants, but they—[at any rate] those in which there are contraries—are never eternal. For their matter involves contrariety from the outset, so that if it is of place, the thing changes with respect to place; if of quantity, the thing changes with respect to growth and decay; and if of affection,[5] the thing undergoes alteration.

4
Failed Correlations and Trans-generic Facts

The animals that are less capable of passing away are neither the largest ones (for the horse is shorter-lived than the human being) nor the small ones (for many insects live for [only] one year); nor are plants in general less capable of passing away than animals (for a few plants live for [only] one year); nor are blooded animals (for bees live longer than a few blooded animals); nor are the bloodless animals (for the soft-bodied animals, though they live for [only] one year, are bloodless) nor are the terrestrial ones (for there are plants and terrestrial animals that live for [only] a year); nor the ones that live in the sea (for in that place both the hard-shelled animals and the soft-bodied ones are short-lived).

In general, the longest-lived ones are found among plants—for example, the date palm. Next, among blooded more than the bloodless animals, and among the terrestrial animals more than the aquatic animals. As a result, when those two features are combined, the longest-lived animals are found among the blooded terrestrial

4. Retaining διὸ . . . ταχύ.
5. I.e., quality.

animals—for example, the human being and the elephant. And, indeed, the largest animals live for the most part longer than the smaller animals; for the other longest-lived ones also happen to be of large size, as in the case of those mentioned.

5
Length and Shortness of Life in Animals Explained

As regards all the above facts, one should get a theoretical grasp on the cause starting from what follows. For it must be grasped that the animal is by nature wet and hot, and to be alive is such, while old age is dry and cold, and so is what is dead; for this is manifestly so. These things—the wet and the hot, the dry and the cold—are the matter for the bodies of animals. It is therefore necessary that as animals age they become dry. That is why the wet must not be easy to dry up. And because of this, oily things are incapable of putrefying. The cause is that they are made of air, and air is fire in relation to the other [elements], and fire never becomes putrefied. Again, the liquid must not be small in quantity; for what is small in quantity is also easy to dry up. That is why the largest ones, both animals and plants, are, to speak in general terms, longer-lived, as was said previously;[6] for it is reasonable for the larger creatures to contain more liquid.

But it is not only because of this that they are longer-lived; for there are two causes, the quantity and the quality, so that the wet must not only be great in quantity, but also be hot in order to be neither easy to solidify nor easy to dry up. And because of this the human being is longer-lived than some of the large animals; for the animals that are deficient in the quantity of liquid are longer-lived if the quality
466b1 of their liquid proportionally exceeds its deficiency in quantity. And in some animals the hot is the oily, which at the same time makes something neither easy to dry up nor easy to solidify. And in some animals it has a different flavor.[7]

Further, what is not to be prone to passing away must not be productive of abundant residue; for something of this sort is destroyed either by disease or by nature; for the capacity of residue is contrary and destructive—sometimes of the [animal's] nature and sometimes of a part [of it]. That is why animals that mate frequently and animals that have abundant seed grow old quickly; for seed is a residue and, further, dries [the body] when it leaves. And because of this the mule is longer-lived than both the horse and the ass from which it came to be, and females than males when the males mate frequently; that is why the male sparrows are shorter-lived than the females. Further, males that are more accustomed to hard labor are also [shorter-lived] and, because of the hard labor, grow older more [quickly]; for the hard labor dries [the body], and old age is dry. By nature, and to speak in general about all

6. 466a9–16.
7. *Sens.* 442a17–19.

cases, males are longer-lived than females; the cause is that the male is a hotter animal than the female.

The same animals are longer-lived in sunny than in cold places due to the same cause due to which they are also larger. And above all the size of the animals that are in their nature cold makes this clear. That is why snakes, lizards, and animals with scales are large in hot places, and the hard-shelled animals in the Red Sea; for the warm liquid is the cause of their growth and life. But in cold places the liquid that is present in the animals is more watery. That is why it is easier to solidify, so that some of the animals that have little blood or are bloodless do not occur at all in northern places (neither terrestrial animals on land nor marine animals in the sea), while others occur but are smaller and shorter-lived; for the frost takes away from their growth.

Both plants and animals pass away if they do not take in nourishment; for they consume themselves. For just as the large flame burns up and destroys the small one by using up its nourishment, so the natural heat, which is what is the first responsible for concoction, uses up the matter in which it is present.

The aquatic animals are less long-lived than the terrestrial animals, not because they are simply wet, but because they are watery. And this sort of liquid is easy to destroy because it is cold and easy to solidify. And what is bloodless [is easy to destroy] due to the same cause whenever it is not protected by its size; for it is neither oily nor sweet; for in the animal, the oily is sweet. That is why bees are longer-lived than other larger animals.

6
Relative Length and Shortness of Life in Animals and Plants Explained

The longest-lived beings are found among plants, and more among plants than among animals, first because plants are less watery, so they are not easy to solidify. Further, they have oiliness and viscosity, which is why, even though they are dry and earthy, the liquid they have is nonetheless not easy to dry up.

But as regards the nature of the trees, the cause must be grasped as to why they live longer; for they have a nature special to them in relation to the animals, except in relation to insects. For plants renew themselves continuously, which is why they live a long time. For there are always other shoots while the old ones grow old, and the roots are the same way, although not at the same time. Rather, at one time the trunk and the branches alone die, and new ones grow up next to them. Whenever they do so, other roots spring from the existing part of the plant, which in this way continues to live while being in one way destroyed and in another growing. That is why [trees] are long-lived.

Plants are like insects, as was said previously;[8] for when they are cut, they stay alive, and become two or more from one. But the [resulting] insects, though they manage to stay alive, cannot do so for long; for they do not have instrumental parts,[9] and the starting-point of life that is present in each [section] cannot produce them. But the starting-point present in the plants can; for plants have a root and a stem everywhere potentially. That is why it is from this starting-point that what is new and what is getting old [in the plant] continually emerge, and there is little difference between this sort of longevity and propagation by taking cuttings.[10] For one might claim that the same also happens, in a certain way, in the case of propagation by taking cuttings; for what is cut off is a certain part. Thus, in the case of propagation by taking cuttings this happens when the cutting is separated from the plant, while in the case of the plant, it is because of its being conjoined with it. The cause is that the starting-point of life is present potentially in every part.

The same thing occurs in both animals and plants. For in animals the males are for the most part longer-lived—their upper parts being larger than the lower parts (for the male is more dwarf-like than the female). And the hot is in the upper part and the cold in the lower. In plants too those with a weighty head are longer-lived. Those that do not live for one year but are tree-like are of this sort. For the upper part of the plant and its head are the roots,[11] and the plants that live for one year take their growth in the direction of the lower parts and the fruit.

About these matters by themselves determinations will be made in the work concerning plants.[12] Now, though, the cause of length and shortness of life has been given for animals as well.[13] It remains for us to get a theoretical grasp on youth and old age, life and death. Once these things are determined, the methodical inquiry concerning the animals will come to an end.

8. 467a11–12.
9. *Juv*. 468b5–9.
10. *Juv*. 468b18, *GA* 761b26–29.
11. *Juv*. 468a1–4.
12. No such work is extant.
13. Retaining ζῴων and secluding ἄλλων.

ON YOUTH AND OLD AGE, LIFE AND DEATH, AND BREATHING*

De Juventute et Senectute, de Vita et Morte, de Respiratione

1
The Nutritive and the Perceptual Soul and Their Relation to the Body

Youth and old age, as well as life and death, must now be spoken about; at the same time the causes of breathing must presumably be stated; for it is because of this that some animals are either living or not living.

Since determinations about the soul were made elsewhere, and it is clear that the substance of the soul cannot be a body,[1] yet it is nonetheless evident that it must be present in some part of the body, and in one of those that have power over the others. Let us now, then, leave aside the other parts or capacities of the soul (whichever they should be called). But for all the things said to be animals and to be alive, among those that happen to be both (by "both" I mean both an animal and alive), there must be one and the same part in virtue of which the living being is alive and in virtue of which we call it an "animal." For it is impossible for an animal, insofar as it is an animal, not to be alive. But insofar as it is alive, it need not be an animal: for plants are alive, but they do not have perception, and it is by perception that we distinguish an animal from what is not an animal. It is necessary, then, for that part to be one and the same in number but more than one and distinct in being; for it is not the same thing to be an animal and to be alive.

Since, then, there is a single perceptual organ common to all the special perceptual organs into which the actual perceptions must come together, and this is located midway between what is called "front" and "back" (the part toward which perception comes to us is said to be the front, its opposite the back) and, further, since the body of all living things is divided into an upper and a lower part (for all living beings have the up and the down, including plants too), it is clear that the nutritive starting-point is to be found midway between them. For the part in virtue of which the nourishment comes in we call "up," looking at this part rather than its whole environment, while we call "down" the part in virtue of which the residue is first expelled. This **468ª1**

* Translated by Andrea Falcon. Text: W. D. Ross, *Aristotle: Parva Naturalia* (Oxford, 1955). In a few editions 470ᵇ5–480ª30 is printed as a separate treatise on breathing: that is why the chapters have double numbers. There is no evidence for this division in the manuscript tradition, and there is no ancient support for it. The treatise as a whole is a single textual unit.
1. *DA* 2.1–2.

is arranged in a contrary way in plants and animals. For among the animals, this arrangement is present above all in the human being because of its upright posture, that is, its having the upper part aligned with the up of the universe, while in the non-human animals the upper part is aligned with the middle region. But in plants, because they are immobile and get their nourishment from the earth, this part must always be down; for the roots in plants are an analog to what is called a "mouth" in animals. Both animals and plants get their nourishment through this part: the plants from the earth, and the animals by their own efforts.

2
The Central Location of the Nutritive and the Perceptual Soul

There are three parts into which all complete animals are divided: one by which the nourishment is received, one by which the residue is expelled, and the third is midway between them. And this last is called the "chest" in the largest animals, while in the other animals it is the analog, and it is more articulated in some animals than others. And in all those capable of moving by progression, there are additional parts attached for this very task, by which they carry the whole trunk: legs as well as feet and those parts that have the same capacity as these. But, at any rate, the starting-point of the nutritive soul is in the middle one of these three parts, as is evident both according to perception as well as according to argument.

For in the case of many animals, when either of the parts is removed, that is, the part that is called "head" and the part that receives the nourishment, they continue to live by aid of that part which is joined with the middle one. This clearly happens in the case of insects, such as wasps and bees; and many animals that are not insects are able to live when divided due to their nutritive part. A part of this sort is actively one, but potentially more than one. For these animals are composed in the same way as plants; for plants too, when divided, continue to live separately, and many trees come to be from a single starting-point. The cause due to which some plants cannot continue to live when divided, while other plants propagate from cuttings, will be
468b1 the object of another account. But this holds in the same way both for plants and for the insect kind.

It is necessary, then, for the nutritive soul to be actually one but potentially more than one in those animals that have it. Likewise also for the perceptual soul; for it is evident that the divided parts of the animals have perception. But when it comes to the preservation of their nature, plants can preserve it, while these animals cannot, because they do not have the instrumental parts for preservation, with some lacking the part for taking in the nourishment, others the part for receiving it, and still others both of them and other parts as well. Animals of this sort are like many animals that have grown together. But those that are composed in the best way cannot be affected in this way because their nature is as unified as possible. That is also why some parts

produce a slight perception when divided, because they still retain some affection of the soul; for when the viscera are taken out, [the animal] still makes a movement, as do tortoises even when their heart has been removed.

3
Additional Arguments for the Central Location of the Nutritive and the Perceptual Soul

Further, it is clear [that the soul is located in the middle] in plants as well as in animals. In plants it is clear to those who investigate their generation from seeds, propagation by grafting, and propagation by taking cuttings.[2] For the generation from seeds occurs in all plants from the middle (for all seeds are bivalves,[3] insofar as they are grown together, and midway between each of the two parts is where both the stem and the root come out in growing plants, and their starting-point is the middle). In propagation by grafting and by taking cuttings this occurs above all around knots. For the knot is a kind of starting-point of the shoot, and at the same time it is also a middle, so that they either cut it off or graft into it in order that the shoot or the roots may come to be from it, on the supposition that the starting-point of the shoot and the root is from the middle.

And in blooded animals the heart comes to be first. This is clear from those cases that we have observed in which animals can be seen as they are still developing. As a result, it is necessary in bloodless animals too for the analog of the heart to develop first. And it was stated previously in the *Parts of Animals*[4] that the heart is the starting-point of the blood vessels,[5] and that blood, in blooded animals, is the nourishment at the final stage, from which [all] the parts develop. Therefore, it is evident, with respect to nourishment, that the mouth has the capacity to perform one sort of work, the stomach another, and that the heart is the most controlling part and adds the end. So it is necessary for the starting-point of the perceptual as well as of the nutritive soul to be in the heart in the case of blooded animals. For the work of the other parts concerned with nourishment is for sake of the work of the heart; for the controlling part should accomplish the for-the-sake-of-which—like a doctor in relation to health—rather than the things that are for the sake of this.

But what rules the perceptual modalities is surely located in the heart in all blooded animals; for in it the perceptual organ common to all perceptual organs must be located. And we see that two perceptual modalities—taste and touch—manifestly extend to the heart, so that it is necessary for the others to do so too; for

2. *Long*. 467ᵃ26–30, *GA* 761ᵇ26–29.
3. *HA* 528ᵃ12–13.
4. 665ᵇ10–22, 668ᵃ27–ᵇ3.
5. Reading ἀρχὴ τῶν φλεβῶν.

it is possible for the other perceptual organs to produce movement in this part, but taste and touch do not extend at all to the upper place.

Apart from these considerations, if being alive lies in this part for all animals, it is evident that the starting-point of perception must do so as well. For it is insofar as it is an animal that we also say that this one is alive; and it is insofar as it has the perceptual capacity that we say that the body is an animal. Why some of the perceptual modalities manifestly extend to the heart while others are located in the head (which is also why it seems to some that animals perceive because of the brain), the cause of this has been stated separately elsewhere.[6]

4
Additional Considerations for the Central Location of the Soul

According to the things that appear to be so, then, it is clear from what has been said that it is in middle part of the three parts of the body that the starting-point of the perceptual soul, as well as that of the soul involved in growth and nutrition, is located. According to argument, on the other hand, we see that in every case nature produces the best of what is possible. And when the starting-point is located in the middle of the substance, each of the two parts will most of all complete its own work, both the part that works on the nourishment at its last stage and the one that is receptive of it; for then the starting-point is situated in the same way with respect to both, and the central region of this sort is the region of what rules.

469[b]1 Further, what uses an instrument and the instrument it uses must be different (and just as in capacity so, whenever possible, also in place), just like pipes and what plays pipes, namely, the hand. If indeed, then, the animal is defined by having the perceptual soul, then blooded animals must have this starting-point in the heart, while bloodless animals in the analogous part.[7]

5
Vital Heat and the Ways in Which It Is Destroyed

All parts of the animals, as well as their entire body, have some innate natural heat. That is why they are manifestly hot while alive, and when they are dead and deprived of life they are manifestly in the contrary condition. It is necessary, then, for the starting-point of this heat to be in the heart in blooded animals, and in the analog in bloodless animals. For all the parts work on—that is, concoct—their nourishment by means of the natural heat, and the most controlling part does so most of all. That is

6. *PA* 656[a]15–657[a]11.
7. Beginning Chapter 5 here rather than at 469[b]21.

why, even when the other parts become cold, life remains [in the animal]. But when it happens in this part, life is destroyed altogether; for the starting-point of the heat for all the other parts comes from there, and the soul has been set aglow, as it were, in these parts—in the analogous part in bloodless animals and in the heart in blooded ones. Therefore, it is necessary for the presence of life and for the preservation of this heat to occur at the same time, and what is called "death" is its destruction.

But we see two ways in which fire is destroyed: exhaustion and extinction. We call "exhaustion" the destruction of fire caused by itself and "extinction" the one caused by its contraries. The first is due to aging, while the second is violent.[8] But it happens that both sorts of destruction come about due to the same cause; for when nourishment is lacking and when the heat cannot take in nourishment, fire is destroyed. [In extinction,] what is contrary, by stopping concoction, prevents fire from being nourished. But it is exhaustion that takes place when a great quantity of heat is amassed due to not breathing or cooling. For in this way too the great quantity of heat amassed quickly uses up the nourishment and gets at using it up before exhalation is established. That is why not only a smaller fire is exhausted when next to a larger one, but also the flame of a lamp burns out by itself when it is placed in a greater flame, just like any other combustible thing. The cause is that the larger flame, by seizing the nourishment in **470ª1** the [smaller] flame, destroys it before fresh nourishment comes in, while the fire is always becoming and flowing like a river, but so quickly as to escape notice.

It is clear, therefore, that if indeed the heat is to be preserved (and this is necessary if one is going to be alive), there must be some cooling of the heat in the starting-point. One may take as an example what happens to coals when they are damped down; for when they are covered all over continuously by what is called a "damper," they are extinguished quickly. But when one lifts the damper and puts it on again, alternating this quickly enough, they remain on fire for a long time. And banking up the fire preserves it; for it is not prevented from breathing owing to the porousness of the ashes, and it is protected by the surrounding air from being extinguished due to the great quantity of heat present in it. But this cause, why contrary outcomes result by banking the fire and damping it (the latter exhausts the fire, while the former preserves it for a long time), this has been spoken about in the *Problems*.[9]

6
Vital Heat and the Need for Its Regulation in Plants and Animals

Since everything that is alive has a soul, and this is not present without natural heat, as we said,[10] in plants the aid provided through their nourishment and the surrounding air is enough for the preservation of their heat. For in fact their nourishment, when

8. Retaining τὴν μὲν γήρᾳ, τὴν δὲ βίαιον.
9. Not in the extant *Problems* attributed to Aristotle.
10. 469ᵇ6–9.

it enters, makes them cool down (just as it does in human beings when they first consume nourishment), but fasting heats them up and makes them thirsty. For when the air is unmoved, it always becomes hot; but when nourishment comes in, the air is moved and cools[11] them until concoction is achieved. But when the environment is excessively cold due to the time of the year, if there are severe frosts, the strength of the heat fades away; but if there are spells of scorching heat and the moisture drawn from the soil is not enough to cool the plants, their heat is destroyed by exhaustion, and trees are said to be blighted and sun-scorched around such times. That is why they place certain kinds of stones and water in pots under the roots, in order for the roots of the plants to be cooled.

But when it comes to animals, since some live in water while others pass their time in the air, they procure their own cooling from these media and through them, the former ones by means of water, the latter by means of the air. In which way and how they do so must be stated after giving more attention to their account.

7 (1)
A Few Facts about Breathing

About breathing [only] a few of the early natural scientists have spoken. For the sake of which end breathing is present in animals, however, some have nothing to say, while others have spoken about it, but they have not done so well, but in a way that betrays inexperience of the relevant facts. Further, they say that all animals breathe, but this is not true. So it is first necessary to review the relevant facts so as not to seem to make empty accusations against those who are gone.

It is evident that all animals that have a lung breathe. But it is also evident that all those that have a [nearly] bloodless and spongy lung have less need of breathing. That is why they can stay under water for a long time relative to the strength of their body. And all egg-laying animals have a spongy lung—for example, the frog kind. Further, freshwater turtles and turtles can stay for a long time immersed in water, for their lung has little heat (for it has little blood). Once the lung is inflated, then, it cools the animal by its movement and enables it to stay [under the water] for a long time. However, if one forces these animals down under water for too long, they all suffocate; for no animal of this sort takes in water like fish do. The animals with a blooded lung have a greater need of breathing due to their greater amount of heat. But none of the others that have no lung breathes at all.

11. Reading καταψύχει.

8 (2)
Democritus, Anaxagoras, and Diogenes of Apollonia on Breathing (1)

Democritus of Abdera and some others who have spoken about breathing have made no determinations about the other animals but seem to speak as if all animals breathed. But Anaxagoras and Diogenes, claiming that all animals breathe, describe the way in which fish and oysters do so. Anaxagoras says that when they discharge water through their gills, fish breathe by drawing in the air that comes to be in their mouth; for he claims that there is no void at all. Diogenes says that when they **471ᵃ1** discharge water through their gills, they draw in the air from the water surrounding their mouth by means of the void created in the mouth, on the assumption that there is air in the water.

But these claims are impossible. For in the first place, they leave out half of the thing at issue because they speak only about what is common to both halves of it. For of what is called "breathing," one half is inhalation and the other half is exhalation. About this—the way in which such animals exhale—they have nothing to say. Nor can they say anything. For when fish have breathed, they must exhale again by that same route by which they inhale, and they must do this always in alternation, so that they at the same time take in water by the mouth and exhale air. But, since they meet, one must impede the other. Then, when they discharge the water, at that point they [also] exhale from their gills or from their mouth, with the result that they exhale and inhale at the same time; for they say that it is then that the animal breathes. But inhaling and exhaling at the same time is impossible. As a result, if the animals that breathe must exhale and inhale, and none of these animals can exhale, it is also evident that none of them can breathe at all.

9 (3)
Anaxagoras and Diogenes of Apollonia on Breathing (2)

Further, to claim that fish draw in air from the mouth, or rather from the water through the mouth, is an impossibility; for they do not have a windpipe because they do not have a lung, but their stomach is right next to their mouth, so that they must do the drawing with their stomach. But then the other animals too would do this; but, as things stand, they do not. And fish too, when they are out of water, would be seen to do this, but manifestly they do not. Further, in all the animals that breathe and draw in breath, we see a certain movement occurring in the part which does the drawing. But this does not happen in the case of fish; for they manifestly do not move any one of the parts in the area of the stomach except for the gills alone, and either in water or when thrown onto dry land they are gasping.

Further, when any animal that breathes dies by drowning in water, bubbles are formed out of the breath that is forcibly discharged—for example, when one forces **471ᵇ1**

turtles or frogs or any other kind of animal of this sort [to remain under water]. But this does not happen in the case of the fishes, no matter how people try to obtain this result, implying that fishes have no breath that is drawn in from outside. Also, the way in which they say breathing occurs in fishes should be possible for human beings too when they are under water; for if even fishes draw in air from the surrounding water by means of the mouth, why should human beings as well as other animals not do the same? We should also draw in the air through the mouth like the fishes do. So if indeed the former case were possible, this too should be possible; but since it is not possible, it is clearly not possible in the case of the latter either.

In addition, due to what cause do they die in the air and manifestly gasp as if they were suffocating, if indeed they breathe? For it is certainly not from lack of nourishment that this happens to them, which is the cause stated by Diogenes, simpleminded as he is. For he says that they draw in too much air when they are in the air, but a commensurate amount when they are under water, and they die because of this. But that should have been possible also in the case of terrestrial animals; but, as things stand, no terrestrial animal is suffocated by breathing too much.

Further, if all animals breathe, it is clear that the insects among them breathe too. But many insects manifestly continue to live when they are cut apart, not only into two parts but also into more—for example, the so-called centipedes. How, and by means of what [instrumental part], could they possibly breathe?

The principal cause of their not speaking well about these matters is both their being inexperienced with the internal parts of animals and their not grasping that nature does all things for the sake of something; for by inquiring about what end breathing is present in animals for the sake of, and by investigating the relevant parts such as the gills and the lung, they would have discovered the cause rather quickly.

10 (4)
Democritus on Breathing

Democritus does say that a certain result is obtained from breathing for the animals that breathe, when he claims that breathing prevents the soul from being squeezed out [of their body]. However, about the fact that nature has done this for the sake of
472a1 this end, he said nothing; for, generally speaking, like the other natural scientists, he too has not touched at all upon such a cause. He says that the soul and the heat are the same, namely, the primary shapes of the spherical atoms. When these atoms are separated out by the surrounding [air] that squeezes them out, he says that breathing comes to be an aid; for in the air there is a great number of such atoms, which he calls "understanding" and "soul." So when the animals breathe and the air comes in, these atoms come in along [with the air], and they counteract the squeezing, [thereby] preventing the release of the soul present in the animals.

And that is why living and dying depend on inhalation and exhalation; for when the surrounding air with its squeezing prevails, and what enters is no longer able to counteract it, because the animal is not able to breathe, then death occurs in animals. For death is the exit from the body of such [atomic] shapes resulting from the squeezing exerted by the surrounding [air]. But the cause due to which it is necessary for all animals to die at some time—not, however, at any random time but in accord with nature due to old age, but contrary to nature by force—he has not made clear at all. And yet, since this evidently happens at one time and not at another, he should have said whether the cause is internal or external. Nor does he speak at all about what the cause of the starting-point of breathing is, whether it is internal or external. For it is certainly not the case that understanding from outside provides the help, but rather the starting-point of breathing and of the ensuing movement comes from within, not due to being forced by the surrounding [air]. It is also absurd for the surrounding [air] to squeeze and at the same time, when it enters, to dilate.

These, then, are pretty much the things that Democritus said happen and how they do so. But if one should believe that what was said previously is true and not all animals breathe, one must suppose that he was given the cause not of all death but only in the case of animals that breathe. But it was not given well even in that case. This is clear from the facts and the sorts of things we all have experience of. For in hot spells, since we are hotter, we are more in need of breathing, and we all breathe more rapidly; but when the surrounding air is cold and contracts and solidifies the body, we hold our breath as a result. And yet it is at this time that what enters from without should prevent the squeezing out. But, as things stand, the contrary happens; for when too much heat is accumulated because breath is not let out, then people are in need of breathing; but after having inhaled, they must exhale. When they are hot, they breathe repeatedly, implying that they breathe for the sake of cooling, just when what [Democritus] says makes them add fire to fire.

11 (5)
Plato on Breathing

The circular thrust described in the *Timaeus*[12] has made no determinations at all as to the way in which the preservation of the heat occurs in the other animals, whether it is the same way or it is due to some other cause. For if breathing is present only in terrestrial animals, the cause due to which it belongs only to those animals must be stated; but if it belongs to the other animals as well, but in another way, this too must be determined, if indeed they are all able to breathe.

12. Plato, *Timaeus* 79a–e.

Further, the mode of causation is a fabrication. For [he says that] as the heat exits the body through the mouth, the surrounding air, being pushed and [thus] set in motion, falls through the open texture of the flesh into the same place whence the inner heat went out, exchanging places due to the fact that there is no void. But as the air becomes hot again, it exits through the same place and pushes the discharged air back into [the body] through the mouth. And indeed the animals keep on doing this all the time, inhaling and exhaling.

But it turns out, for those who hold this account, that exhaling takes place before inhaling. But it is the other way around. And there is a sign of this; for while inhaling and exhaling occur in alternation one after the other, animals exhale when they die, so the starting-point must be an inhaling.

Further, with respect to that for the sake of which this whole process is present in animals (I mean inhaling and exhaling), those who speak in this way have said nothing at all, but deal with it as if they were dealing with a mere coincidence. And yet, we see that these processes have control over life and death: when animals that breathe can no longer do so, then their destruction ensues.

Further, it is absurd to claim that we are unaware of the going out of the heat through the mouth and its subsequent coming back, while we are aware of the coming into the chest of the breath and its subsequent going out once it has been heated. And it is also absurd for inhaling to be the coming in of the heat; for it is manifestly the other way around; for what is exhaled is hot, whereas what is inhaled is cold. But when what is inhaled is hot, animals pant for breath; for because what enters is not
473a1 enough to cool them, they often gasp for more breath.

12 (6)
Respiration and Nutrition

But, at any rate, one should not take breathing to be for the sake of nutrition, believing that the inner fire is nourished by breath, and that when one breathes it is like adding combustible material to the fire, with exhalation occurring when the fire is nourished. For against this account we will repeat precisely the same arguments we also used against the previous ones; for this, or the analog of this, should also happen in the case of the other animals; for all animals possess vital heat. Then, with respect to the coming to be of heat from breath, in what way is the process to be accounted for? This is a fabrication; for we rather see that the heat comes to be from the nourishment. Also, the nourishment is taken in and the residue discharged through the same orifice; but we do not see this happen in other instances.

13 (7)
Empedocles on Breathing

Empedocles too speaks about breathing; however, he does not say for the sake of what it occurs, nor does he make it clear at all with respect to all animals whether they breathe or not. And when he speaks about breathing through the nostrils, he also thinks that he is speaking about the fundamental sort of breathing. For there is both breathing through the windpipe out the chest and breathing through the nostrils; but without the windpipe there is no breathing by means of the nostrils themselves. And when animals are deprived of breathing through the nostrils, they do not suffer any ill effects; but when they are deprived of breathing through the windpipe, they die. For nature makes use of breathing through the nostrils as a subsidiary end for smelling in some animals. That is precisely why almost all animals have a share in smell, while they do not all have the same perceptual organ. These matters are spoken about in a more perspicuous way elsewhere.[13]

[Empedocles] says that inhalation and exhalation occur through certain vessels in **473b1** which there is blood, though they are not full of blood but have ducts leading to the external air, which are smaller than the particles of blood[14] but large enough for those of the air. That is why, since blood is naturally moved up and down, when it is carried downward, air flows in and inhalation occurs, but when blood is carried upward air is driven out and exhalation occurs. He likens this process to what happens in clepsydras:

> They all inhale and exhale in the following way: in all of them, passages empty of blood,
> Made of flesh, are stretched deep inside the body,
> And at their openings the extremities of the nostrils
> Are pierced through and through with numerous furrows, so that blood
> Is kept inside but at the same time an easy passage for the breath is cut.
> Whenever, then, the tender blood rushes away from there,
> Bubbling breath rushes after it with furious swell,
> But when the blood runs back, the air is exhaled again—just as when a girl
> Playing with a clepsydra of shining bronze
> Places the opening of the pipe against her well-shaped hand,
> And immerses it in the tender body of silvery water,
> No liquid enters the vessel, but this is kept out
> By the mass of the air pressing from inside through the numerous holes,
> Until it recovers its dense flow, but then,
> As the breath leaves, an equal amount of water runs in.
> So, in the same way, when she holds water in the depths of the brazen vessel

13. *Sens.* 444a25–28, 444b7–28.
14. Reading αἵματος.

Blocking the opening and duct with her mortal hand,
The breath outside, longing to come inside, forces the liquid back,
At the gates of the harsh-sounding strainer,[15] controlling the ends [of the clepsydra],
Until she lets go with her hand; and then, again, in reverse from before,
As the breath comes in, an equal amount of water flows out.
So, in the same way, the tender blood surging through the limbs,
When it rushes back deep down inside [the body],
A stream of breath enters straightaway, raging in a swell;
But when the blood runs back, an equal amount is breathed out in return.[16]

Empedocles, then, says these things about breathing. But, as we said,[17] animals are evidently breathing through the windpipe at the same time as they are breathing through the mouth and through the nostrils. So if he is speaking about this sort of breathing, it is necessary to inquire how the account of the cause given [by him] will fit with it. For it manifestly happens the other way around. For it is by expanding the [relevant] place, just like the bellows in a blacksmith's forge, that animals inhale (and it is reasonable for the heat to expand, and for the blood to take the place of the heat), but by contracting it and pressing it down, as in the case of the bellows, they exhale. Except that in the case of the bellows, they do not take the air in and let it out again through the same passage, whereas those who breathe do so by the same passage.

But if Empedocles is speaking only about breathing with respect to the nostrils, he has made a great error; for there is no breathing that is peculiar to the nostrils, but the breath passes by the pipe next to the uvula where the extremity of the roof of the mouth is located, with part of it going through the nostrils connected by a passage, and part of it going through the mouth, likewise as it comes in and as it goes out.[18]

The statements made by others on the topic of breathing, then, present difficulties of these and this many sorts.

14 (8)
Why All Animals Need to Control Their Bodily Temperature

Since, as was stated previously,[19] being alive—that is, possessing a soul—involves a certain heat (for there is not even concoction, by which nourishing occurs in animals, without a soul or without heat; for all things accomplish their work by means of fire), that is precisely why it is necessary for a starting-point of this sort to be in the body's

15. I.e., the duct or tube of the clepsydra in which the breath makes gurgling sounds.
16. B100 DK.
17. 473a19–21.
18. *HA* 495b5–24.
19. 468b6–9; 470a19–20.

primary place, and indeed in the primary part of that place, where it is necessary for the primary nutritive soul also to be present. This is the place midway between the part that receives the nourishment and that from which the residue goes out. **474ᵇ1**

In bloodless animals it has no name, but in blooded animals this part is the heart; for the nourishment out of which the parts of blooded animals come to be is of the nature of blood. And both the blood and the blood vessels must have the same starting-point; for one is for the sake of the other, like a vessel and a container. The starting-point of the blood vessels in blooded animals is the heart; for they do not extend through the heart but rather they are all attached to it. This is clear to us from the *Dissections*.

The other capacities of the soul cannot be present without the nutritive soul (due to what cause was stated previously in the *De Anima*[20]), and this cannot be present without natural fire, in which nature has set it aglow. Fire is destroyed, as was stated previously,[21] by extinction and exhaustion. Extinction is destruction by contraries, which is precisely why fire is extinguished in a mass by the surrounding coldness and more quickly when it is scattered. This sort of destruction is violent in animate and inanimate things alike. For when the animal is either cut apart by instruments or is frozen due to an excess of cold, it dies. Exhaustion, on the other hand, occurs through a large quantity of heat; for when the surrounding heat is excessive, and the animal does not take in nourishment, it dies by being burned out, not by becoming cold but by being exhausted. As a result, there must be cooling if the animal is going to secure its preservation; for this aids against this sort of destruction.

15 (9)
Insects and Other Bloodless Animals

Since some animals are aquatic while others spend their life on land, in the altogether small and bloodless ones the cooling that results from the surrounding water or air is enough aid against this sort of destruction; for having little heat they need little aid. That is also why almost all such animals are short-lived; for since they are small, it takes little to tilt the balance in either direction.[22]

But of the insects (for all insects are bloodless), all those that are longer-lived are split below the diaphragm so as to be cooled through the membrane which is rather thin. For since they are hotter [than the other insects], they are in need of more cooling, for example, bees (for some bees live up to seven years) and all the others that buzz, for example, wasps, cockchafers, and crickets. They make a sound by means of breath, as if they are panting. For in their diaphragm itself, by means of their innate breath expanding and contracting, a rubbing against the membrane occurs; for they **475ª1**

20. 413ª31–ᵇ2, 434ª22–26.
21. 469ᵇ21–470ª5.
22. I.e., either toward loss of heat and death or retention of heat and life. See 478ª16.

move this place like animals that breathe air from the outside with their lung and fish with their gills. For much the same happens if one suffocates one of the animals that breathe by holding the mouth shut. For these too will make this heaving movement with their lung: but for them such a movement does not produce enough cooling, while it is enough for insects. And it is by rubbing against their membrane that insects make their buzzing sound, as we say, just like children do when they blow through reeds bored with holes covered by a thin membrane. For it is because of this that cicadas too sing their songs; for they are hotter [than the other insects] and they are split below their diaphragm, while those that do not sing have this part unsplit.

Among animals that are blooded[23] and have a lung, but a lung with little blood and spongy, some, because of this, can live without breathing for a long time, because the lung can expand greatly since it has little blood and liquid; for its own movement suffices to keep [the animal] cool for a long time. In the end, though, it cannot do so, and [the animal] is suffocated by not breathing, as was also said previously;[24] for the sort of exhaustion that occurs in the absence of cooling is called "suffocation," and we say that the animals that die in this way are suffocated.

That, among animals, insects do not breathe was also said previously,[25] and this is also manifest in the case of small animals like flies and bees; for they can swim in liquids for a long time if the latter are not too cold or too hot (although those with little capacity try to breathe more frequently). But they die and are said to suffocate when their stomach is filled [with liquid] and the heat in their diaphragm is dissipated. And that is also why they revive after having spent some time in [warm] ash.

All aquatic animals that are bloodless live longer in the air than those that are blooded and take in seawater as, for example, fishes do. For, because they have little heat, the air is enough to cool them for a long time—for example, the soft-shelled animals and the octopuses. In the end, however, the little heat they have does not suffice to keep them alive.[26] Thus many fishes too live in the earth, yet in a motionless state, and are found by digging them up. For those animals that either have no lung at all or else a bloodless one need to be cooled less frequently.

16 (10)
Blooded Animals

Concerning the bloodless animals, then, it was stated[27] that in some cases it is the surrounding air that aids with preserving life, while in other cases it is the surrounding liquid. But as for blooded animals that have a heart, all those that have a lung

23. Reading ἐναίμων.
24. 470b18–24.
25. 471b19–23.
26. Accepting the seclusion of διὰ.
27. 474b25–475a20.

take in air and produce their cooling through inhalation and exhalation. And animals that are live-bearing internally and not only externally have a lung (for the selachians are live-bearing, but not internally), and, among the egg-laying animals, the winged ones, like the birds, and the hard-scaled ones, like the turtles, lizards, and snakes. But while the former have a blooded lung, most of the latter have a spongy one. That is also why they make more infrequent use of breathing, as was also stated previously.[28] All animals that pass their time, or make their life, in water make use of breathing—for example, the water-snake kind, the frog kind, the crocodile kind, the freshwater-turtle kind, sea and land turtles, and seals. For all these animals, and similar ones, give birth on dry land and sleep either on dry land or in water, holding their mouth above water for breathing,

But all animals that have gills cool themselves by taking in water; both the so-called **476^{a}1** selachian kind and the other footless animals have gills. And all fishes are footless; for the parts they in fact have are said to be what they are[29] in virtue of their similarity to wings (*pteruges*). Of those that have feet only one among those that have been observed has gills, the animal called a "water newt."

But no animal has yet to be seen that has both a lung and gills. The cause is that a lung is for sake of cooling by means of breath (it seems that the lung (*pneumôn*) has taken its name from being a receptacle of the breath (*pneuma*)), while gills are for cooling by means of water. One instrument is useful for one work, and one sort of cooling is enough for all animals; so, since we see nature doing nothing pointless, and since one of the two sorts of cooling would be pointless, because of this some animals have gills while others have a lung, but none has both.

17 (11)
Blooded Animals Continued

Since each animal needs nourishment for its existence, and cooling for its preservation, nature uses the same instrument for both, just as in a few animals it uses the tongue for flavors as well as for speech, so in animals with a lung it uses what is called a "mouth" for working on the nourishment as well as for inhaling and exhaling. But in animals that do not have a lung and do not breathe, the mouth is for the working on the nourishment, while for those that are in need of cooling, the nature of the gills is present for cooling.

As for how the capacity of the mentioned instruments produces the cooling, we will say later on.[30] But with a view to the nourishment's not hindering [cooling], it happens in much the same way with the animals that breathe and with those that take in water; for they do not breathe at the same time as they admit nourishment.

28. $470^{b}12$–15.
29. I.e., fins (*pterugia*).
30. $480^{a}16$–$480^{b}20$.

Otherwise, they would be suffocated due to the nourishment, whether dry or liquid, going through the windpipe into the lung; for the windpipe is located before the esophagus, through which the nourishment travels to what is called the "stomach." In four-footed blooded animals the windpipe has the epiglottis as a sort of lid. But there is no epiglottis added to the windpipe in birds and in egg-laying four-footed animals; instead, they produce the same result by contraction. For when they take in their nourishment, the latter animals contract their windpipe, while the former close the epiglottis; and when the nourishment has gone by, the latter expand the windpipe, while the former open the epiglottis and admit breath for cooling.

As for the animals that have gills, it is only after they have expelled the water through the gills that they admit nourishment through the mouth; for they do not have a windpipe, so they cannot be harmed in any way by the entrance of the water but only if it goes into the stomach. That is why they expel [water] and take nourishment quickly, have sharp interlocking teeth, and pretty much all are sawtoothed; for they cannot chew the nourishment.

18 (12)
Cetaceans

Among aquatic animals, one might raise a puzzle about cetaceans (for example, about dolphins, whales, and those other animals having a so-called [blowhole] pipe), but they too admit of an account. For they are footless and, though having a lung, take in seawater. The cause of this is what has now been stated;[31] for they do not take in liquid for the sake of cooling. For this is accomplished by their breathing; for they have a lung. That is also why they sleep holding their mouths above water and snore (at any rate, dolphins do). Further, when they are caught in nets, they are quickly suffocated due to their not breathing; that is also why such animals are seen coming to the surface of the sea for the sake of breathing. But since it is necessary for them to get their nourishment in water, they must expel the water they take in, and that is why they all have a pipe. After taking in the water, just like fish do through the gills, these animals push it out through the pipe. The location of the pipe is also a sign of this; for it leads to none of the parts filled with blood, but instead has its position in front of the brain.

Due to the same thing both the soft-bodied and the soft-shelled animals take in water, I mean the animals called "crayfishes" and the crabs. None of them are in need of cooling at all; for each of them possesses little heat and is bloodless, so that they are cooled down sufficiently by the surrounding water. But because of the nourishment, they expel the water to prevent it from flowing in at the same time as they swallow. Soft-shelled animals such as crabs and crayfishes expel the water through the opercula

31. Reference unclear.

located beside their shaggy parts, while cuttlefish and the octopuses do it through the hallow area above what is called their head. These animals are written about with more exactness in the *History of Animals*.[32]

Concerning the taking in of water, then, it has been stated that it occurs because of cooling and because the animals that are aquatic by nature need to take in their nourishment from the water.

19 (13)
Cooling Explained

In what way cooling occurs in animals that breathe and also in those that have gills must next be spoken about. It was stated previously[33] that all animals that have a lung breathe. But as to why some animals have this part, and why those that have it are in need of breathing, the cause of having it is that the more estimable animals have a greater quantity of heat; for at the same time they must also have a more estimable soul. For these animals are more estimable than the nature of plants.[34] That is also why the animals that have the most blooded lung and the most heat are greater in size, and the animal that makes use of the purest and greatest quantity of blood is the one that is most upright of all, namely, the human being, which alone has the upper part aligned with the upper part of the universe because of having this part.[35] So this part must be posited as the cause of the substance in the human being as well as in the other animals, just like any other. They have it, then, for the sake of this.

But one must think that the cause that is of necessity[36] and the moving one compose animals of this sort just as they have composed many others that are not of this sort. For some living beings are made of a greater quantity of earth, like the plant kind, while others are made of a greater quantity of water, like the aquatic-animal kind. But when it comes to winged and terrestrial animals, the former are made of a greater quantity of air, the latter of fire. It is in its proper place, though each has its position.

20 (14)
Empedocles on Why Animals Dwell in Water

Empedocles did not speak well when he said that animals with the greatest quantity of heat and fire are aquatic, avoiding the excess of heat in their nature, so that, since they are lacking in the cold and the wet, they can be restored in accord with their **477b1**

32. 4.1–3.
33. 476b11–12.
34. Reading φυτῶν.
35. I.e., a lung filled with the purest and largest quantity of blood.
36. I.e., the material one.

place, which has a contrary quality; for he says that the wet has less heat than the air. But it is wholly absurd to suppose that each of these animals, being generated on dry land, could change its place and go into the water; for most of them are also pretty much footless. But Empedocles says that their initial composition occurred on dry land, which they fled to go into water. Further, it is not evident that aquatic animals are hotter than terrestrial ones; for some of them are altogether bloodless, while others have little blood.

Which living beings one should say are hot and which cold has been investigated[37] taking each kind by itself. But concerning the cause that Empedocles has stated, though in a way what he is seeking to show is reasonable, what he in fact says is certainly not true. For while those that have excesses in their [bodily] states are preserved by contrary places and seasons, their nature is best preserved in their proper places. For the matter out of which each animal is composed is not the same as its states and dispositions. I mean, for example, if nature had composed something out of wax, it would not preserve this thing by putting it in a hot place, nor if it had composed it out of ice. For the thing would have been destroyed quickly by its contrary; for the hot melts what is composed by its contrary. Nor if it had composed something out of salt or niter would nature have deposited it in water by transporting it; for water destroys the things composed by what is dry.

If, then, the wet and the dry serve as matter for all bodies, it is reasonable for the living things made out of the wet and the cold to dwell in wet places,[38] and for those made out of the dry to dwell in a dry place. Because of this, trees do not grow in water but on dry land. And yet, it is a consequence of his account that they should be placed in water because they are exceedingly dry, just as he says happens to what is exceedingly fiery; for they would have gone into it not because it is cold but because it is wet.

The natures of the matter, then, are of the same sort as is the place in which they are found: in water, wet natures; on dry land, dry natures; and in air, hot natures. However, the states that are excessively hot are better preserved when placed in a cold place, those excessively cold in a hot place; for the place reduces to the mean the excess in the states. This, then, must be sought in the places proper to each sort of matter and in accord with the change in the seasons, which is common to all; for while the states may be contrary to the places, this is impossible for the matter.

About the fact, then, that it is not because of the heat of their nature that some animals are aquatic and others terrestrial, as Empedocles says, and why some do not have a lung while others do, let this much be said.

37. *PA* 648ᵃ36–ᵇ10.

38. Retaining καὶ ψυχροῦ and accepting the seclusion of καὶ εἰ ψυχρά, ἔσται ἐν ψυχρῷ.

21 (15)
Breathing Explained

But why do the animals that have a lung take in air and breathe, especially all those that have a blooded lung? The cause of breathing is the lung, which is spongy and filled with passages. And, among those that are called "viscera," this part is the most filled with blood. All animals, then, that have a blooded lung are in need of rapid cooling because it takes little to tilt the balance of their vital heat,[39] with the cooling penetrating inside the whole lung on account of the large quantity of blood and heat. And the air can do both these things easily. Because it has a fine-grained nature, it slips through everywhere and cools the lung quickly, while water is the contrary. And why those animals that have a blooded lung breathe the most is clear from these considerations; for the part that is hotter is in need of more cooling, and at the same time [as it cools the lung] the breath travels easily all the way to the starting-point of the heat in the heart.

22 (16)
The Relation of the Heart to the Lung and the Gills

As for the way in which the heart is connected by a passage to the lung, one must observe it from the dissections and from what is written in the *History of Animals*.[40] In general, the nature of animals is in need of cooling because of the setting aglow in the heart of the soul. This cooling is produced by breathing in all animals that have not only a heart but also a lung. But all those that have a heart but not a lung—for example, the fishes, because their nature is aquatic—produce the cooling by means of water through the gills.

One must observe the position of the heart with respect to the gills visually from the dissections,[41] but for exactness from the *History of Animals*.[42] But to speak in a summary fashion also now, the parts are related in the following way. For while the heart might not seem to have the same position in the terrestrial animals and the fishes, it in fact has the same one; for the heart has its pointy end where the animals incline their heads. But since the heads are not inclined in the same way in the terrestrial animals and in the fishes, the heart [in the case of the fishes] has its pointy end toward the mouth. From the extremity of the heart a sinewy vessel-like pipe extends to the center where all the gills join together with one another. This is the largest one, but on either side of the heart others also extend to the extremity of **478b1**

39. 474b31.
40. 496a27–34.
41. This may be a reference to actual dissections.
42. 507a2–10.

the gills, through which the cooling reaches all the way to the heart, with the water always passing through the gills.

In the same way, in the animals that breathe, the chest moves up and down frequently while they take in and let out their breath, just like the gills in the fishes. And the animals that breathe are suffocated when there is little air and it remains [always] the same; for in either case they quickly become hot; for contact with the blood heats in either case, and being hot, it prevents the cooling of the animal. And when the animals that breathe cannot move their lung, or the aquatic animals their gills, due to an affection or due to old age, at that point death must ensue.

23 (17)
Natural Death

Birth and death are common to all animals, but the ways in which they happen differ in form; for passing away is not without difference, although there is something in common to all cases. One sort of death is violent, another natural: it is violent when the starting-point is external, natural when the starting-point is within the animal, and the composition of the part is such [as to be liable to it] from the start, rather than an acquired affection. In plants [the process leading to natural death] is called "withering," in animals "aging." Death and passing away happen alike to all the living beings that are not incomplete. They occur in the incomplete ones in a closely similar but distinct way. By "incomplete" I mean, for example, eggs and the seeds of plants (all those that are without roots). To all of them passing away comes about owing to a failure of a certain sort of heat, which in complete living beings is the one found in the part in which the starting-point of their substance resides. This starting-point is located, as was stated previously,[43] where the up and the down are joined together: in plants midway between the stem and the root, in blooded animals in the heart, and in bloodless animals in the analogous part. Some of these living beings have several starting-points potentially, yet not indeed actively. That is also why some insects continue to live after they are divided, and why all blooded animals that are not too full of life continue to live for a long time when their heart is removed—for example, the turtles, and they move their feet if their shell is attached to them, because their nature is not put together well, but it is much the same as in the insects.

The starting-point of life fails in those that have one, whenever the heat associated with it is no longer cooled; for, as has been said many times,[44] it is consumed by itself. Whenever, then, the lung in some animals and the gills in others have hardened, because over a long time the lung or the gills have dried up and become earthy, they

43. 467ᵇ32–468ᵃ5.
44. 469ᵇ26–470ᵃ5; 474ᵇ20–24; 474ᵃ27–29.

are no longer able to move these parts, that is, to expand and contract them. Finally, they come to a halt and the fire dies out completely exhausted.

That is also why, beset even by a minor affection, animals die quickly when in old age. For because there is little heat, since most of it has been breathed away in the long-lived life, whatever strain occurs on the relevant part will extinguish it quickly, as if there was in this part a feeble and small flame that is extinguished by a slight movement. That is also why death in old age is painless; for people die without any violent suffering occurring to them, and the release of the soul is entirely imperceptible. And all diseases that make the lung hard either due to tumors, to residues, or to an excess of morbid heat, as in the case of fevers, shorten the breath due to the inability of the lung to make its full extension upward and contraction. In the end, when the animals are no longer able to move it at all, they die after having exhaled their last breath.

24 (18)
A Few Definitions

Generation is the first participation in the heat of the nutritive soul; life is the persistence of this participation. Youth is the growth of the primary part that has the capacity to cool, old age is the decline of this part; the prime of life is midway between them. End of life and passing away: the violent one is the extinction and exhaustion of the heat (a living being may be destroyed by either cause), while the natural one is the exhaustion of the same thing over a long time occurring at the very end of life. In plants this is called "withering," and in animals "death." Death in old age is the exhaustion of this part because of its inability to cool due to old age.

479b1

What generation, life, and death are, then, and due to what causes they occur in animals, has been stated.

25 (19)
Suffocation Explained

It is also clear from these considerations due to what cause the breathing animals are suffocated in water, the fishes in the air; for, in the latter, cooling takes place through water and in the former through air, and they are each deprived of the one or the other when they change their places. And the cause of the movement, for fish of the gills and for breathing animals of the lung (due to the expansion or contraction of which the ones inhale and exhale air while the others take in and take out water) as well as the composition of their bodily instrument, are as follows.[45]

45. Aristotle does not fulfill this promise until he has dealt with the heart in Chapter 26. The connection between the swelling of the heart and the need for cooling is made apparent at the outset of Chapter 27.

26 (20)
Palpitation and Pulsation

There are three occurrences involving the heart that are thought to have the same nature, but in fact they do not have the same one: palpitation, beating, and breathing.

Palpitation is the compression of the heat in the heart due to a cooling caused by residues or colliquescences[46]—for example, in the disease called "tremors" as well as in other diseases. But it occurs also in fits of fear; for people who are frightened become cold in the upper part [of their body], while the heat produces the palpitation by withdrawing and concentrating [in the heart]. It is compressed into such a small area that sometimes the heat is extinguished, and the animals die of fright and from a morbid affection.

The beating that occurs in the heart, which, as can be seen, is produced continuously, is like [the throbbing caused by] abscesses, which is a movement that is produced along with pain because the change in the blood is against nature and goes on until there is a discharge of pus once it is concocted. This affection is like boiling, for boiling occurs when liquid is made breathy by heat; for it expands due to its increase in bulk. But while the end-point in abscesses—since if the liquid does not evaporate, it becomes thicker—is putrefaction, in boiling it is the liquid's escape from its containers.

In the heart, however, the heat-induced swelling up of the liquid resulting from the nourishment, which is constantly flowing in, causes pulsation as it rises to the outer wall of the heart. And this process is always going on without interruption, for there is a constant inflow of the liquid from which the nature of the blood is produced. For it is in the heart that the blood is first crafted. This is clear at the initial stage of generation; for though the blood vessels are not yet determined, the heart manifestly contains blood. And that is why the heart beats more in the young than in the old; for the exhalation[47] is more abundant in the young.

And all the blood vessels beat, and they do so at the same time as each other because they are attached to the heart. And the heart is always in movement, so that they are too, and at the same time as each other, when the heart is in movement.

Palpitation, then, is the pushing back of the heart against the compression caused by the cold, while beating is the vaporization of the heated liquid.

27 (21)
The Mechanics of Breathing Explained

Breathing occurs when there is an increase of the heat in which the nutritive starting-point resides. For just as the other parts are also in need of nourishment, so is this

46. *GA* 724ᵇ26–28.
47. *Somn.* 456ᵇ2–5.

part,[48] and more so than the others; for it is the cause of the nourishment for the others. It is necessary, then, for the heat, as it increases, to cause the instrument to expand. And one must suppose that the composition of this instrument is much the same as the bellows in a blacksmith's forge (for the lung and the heart are not far from having this sort of shape). But something of this sort must be double; for the nutritive capacity must be in the middle of the cooling capacity.

As the heat increases in quantity, it expands, and as it expands, it must also cause the surrounding part to expand. This is precisely what breathing animals are seen to do; for they expand their chest because the starting-point situated in this sort of part does this very same thing. And as the chest expands, it is necessary for the external air, which is cold, to rush in as into a bellows, and having a chilling effect it extinguishes the excess of fire. But just as the increase [in the heat] expands this part, so its decrease must contract it; and as this part contracts, it is necessary for the air that entered to go out again, entering cold but going out hot due to its being in contact with the heat present in this part. And this is especially the case in animals that have a blooded lung; for the air must go into the many pipe-like passages in the lung, alongside each of which there extends a blood vessel, so that the whole lung seems to be full of blood. The entrance of the air is called "inhalation," and its exit "exhalation." And this process goes on without interruption as long as the animal is alive and moves this part without interruption; and that is why being alive consists in inhalation and exhalation.

480^{b}1

It is in the same way that the movement of the gills occurs in the fishes too. For when the heat in the blood present throughout their bodily parts expands, the gills expand as well, and let the water pass through. As the water goes into their body through the ducts toward the heart and cools it, the gills contract and expel the water. As the heat in the heart constantly expands, it constantly receives water and expels it again when it is cooled. That is why the end of living and non-living in animals that breathe consists in breathing and in animals with gills in taking in water.

As regards the investigation of life and death and related matters, pretty much everything has been spoken about. But concerning health and disease, it is not only for the doctor but also for the natural scientist to give their causes, at least up to a point. And it must not be overlooked how different these two endeavors are, and how they are theoretically concerned with different subjects, since what happens testifies that their study follows the same course up to a point. For those doctors who are subtle and inquisitive have something to say about nature and claim to take their starting-points from there, while the most accomplished among those who are concerned with the study of nature end up dealing with the starting-points of medicine.[49]

48. I.e., the heart.
49. *Sens.* 436^{a}17–^{b}1.

ON THE HISTORY OF ANIMALS*

BOOK 1

1.1
Parts of Animals and How They Differ; Forms and Kinds; Differences in Animals: Lives, Actions, Characters, and Parts

Among the parts present in animals, some are incomposite, those that divide into uniform parts (for example, flesh into flesh), and the others composite, those that divide into non-uniform ones (for example, the hand does not divide into hands, nor the face into faces). Among the latter, some are called not only "parts" but "members."[1] Of this sort are whichever parts, while being wholes, have other parts within them—for example, the head, the leg, the hand, the arm as a whole, and the thorax;[2] for these are themselves whole parts, and there are other parts belonging to them. All the non-uniform parts are composed of uniform ones—for example, the hand of flesh, sinews, and bones.

Some of the animals have, with respect to each other, all their parts the same; others have parts that are distinct. Some parts are the same in form—for example, one human being's nose and eye and another human being's nose and eye, one's flesh and another's, one's bone and another's. And it is the same way with a horse, and whichever other animals we say are the same as each other in form; for as the whole is to the whole, so too each part is to each part. In other cases, though they are the same [in form], they differ by excess and deficiency, all those whose kind is the same. By "kind" I mean, for example, the bird and the fish; for each of these exhibits difference with respect to kind, and there are many forms of fishes and of birds.

Pretty much most of the parts in animals differ in the contrarieties of their affections (for example, of colors and shapes), in that some have the same ones more, others less, and additionally in greater or fewer number, and larger or smaller size, and, in general, in excess or deficiency. Thus, some are soft-fleshed, others hard-fleshed; some have a long beak, others a short one; some have many feathers, others few. Nonetheless, even in the cases we are considering, it sometimes happens that different

* Translated by C. D. C. Reeve. Text: P. Louis, *Histoire des Animaux* (Paris, 1964–1969), except where indicated. A *historia* is not a history, in our sense of the term, but an inquiry. Animals and animal parts of uncertain identity have their Greek names italicized and uninflected.

1. In many cases these are limbs.

2. 491^{a}29–30.

ones have different parts—for example, some have spurs, others do not, some have crests, others do not. But (one might almost say) most of the parts, and those from which the whole bulk of the body is composed, are either the same [in form] or differ by way of a contrariety, that is, with respect to excess or deficiency; for the more and less may be taken as a sort of excess or deficiency.

Some animals, however, have parts that are neither the same in form nor in excess or deficiency, but analogous—for example, bone in relation to spine, nail to hoof, and hand to claw, feather to soft-scale; for what in the bird is feather in the fish is soft-scale.

These are the ways in which all the animals are distinct or the same as regards their parts; further, they do so as regards the position of the parts; for many animals have the same parts, but differently positioned—for example, some have breasts on the chest, some near the thighs.

487^a1 Among the uniform parts, some are soft and liquid, others dry and solid, and those that are liquid may be so generally or only while in their natural condition—for example, blood, serum, fat, suet, marrow, semen, bile, milk (in those that have it), flesh, and the analogs of these. And further, in another way, the residues—for example, phlegm and the sediments[3] of the bowel and of the bladder. And examples of dry and hard are sinew, skin, blood vessel, hair, bone, cartilage, nail, horn (for it is a homonym related to the part[4] when due to the shape the whole is also said to be horn), and further, those analogous to them.

The differences in the animals are in accord with their lives, actions, characters, and parts, about which we speak first in outline, and later speak scientifically about each kind.

The differences with respect to their lives, actions, and characters are of the following sorts: some animals are aquatic, others terrestrial. But the aquatic ones are twofold: some because they live and get their nourishment in a liquid, take in liquid and emit it, and when deprived of it are incapable of living (for example, this happens in the case of many of the fishes); others get their nourishment and pass their time in liquid, yet do not take in liquid, but rather air, and generate offspring outside the liquid. Many of these too are footed (for example, the otter, the *latax*, and the crocodile); many are winged (for example, the puffin and the grebe); and many are footless (for example, the water snake). And some animals, though they get their nourishment in a liquid and are not capable of living out of it, are yet not capable of taking in either water or air (for example, the anemones and the shellfishes).

Among the aquatic animals, some are in the sea, others in rivers, others in lakes, others in marshes (for example, the fishing frog[5] and the water newt).

3. I.e., residues.
4. Reading πρὸς τὸ μέρος.
5. Or anglerfish (*Lophius piscatorious*).

Among the terrestrial ones, some take in and emit air, which is called "inhalation and exhalation" (for example, the human being and all the terrestrial ones that have a lung), others do not take in air, although they live and get their nourishment on land (for example, the wasp, the bee, and the other insects). (I call "insects" (*entoma*) those ones that have sections (*entoma*) on their body, whether on their underneath parts only, or both there and on their back parts). And many of the terrestrial animals, as was said,[6] get their nourishment from liquid, while none of the aquatic ones that takes in seawater does so from land.

Some animals first live in liquid, then change to another shape and live out of it—for example, *aspis*[7] in rivers are a case of this; for gadflies come from them.

Further, some animals are stationary, while others change with respect to place. The stationary ones are in liquid; none of the terrestrial ones is stationary. But in liquid we find many that live by being attached to something—for example, many kinds of shellfishes. The sponge too seems to have a sort of perception. A sign of this is that it is more difficult to detach, unless the movement is produced surreptitiously—or so they say. On the other hand, some both attach and detach themselves—for example, a certain kind of so-called anemones (for some of these detach themselves at night and feed). Many animals, though detached, are unmoving—for example, the shellfishes and so-called sea cucumbers. But some are swimmers—for example, the fishes, the soft-bodied animals, the soft-shelled animals (for example, the crayfishes). And some move by walking—for example, the crab kind; for, though they are aquatic, their nature is to move by walking.

Among the terrestrial animals, some are winged (such as birds and bees, and these are so in a different way from each other), others footed. And among the footed ones, some move by walking, others creep, and others wiggle. None though is only a flyer, as a fish is only a swimmer; for even the skin-winged animals move by walking—even bats have feet (as also does the seal,[8] which has docked feet).

Among the birds, some have bad feet, because of which they are called "footless birds." But this sort of small bird is a flyer. And the ones that are like it are also pretty much flyers and have bad feet—for example, the swallow and the swift; for all birds of this sort have like ways and like feathers, and their looks are nearly the same as each other. The footless bird is visible in every season, the swift when it has been raining in summer; for then it is seen and caught, but, in general, this bird is rare. But many animals are walkers and flyers.

There are also differences of this sort with respect to lives and actions. For some animals are gregarious, others solitary, whether they are footed, winged, swimmers, or play a double game.[9] Also, of the gregarious ones and the solitary ones, some are political, while others are more dispersed. Examples of gregarious animals are, among

6. 487ᵃ19–20.
7. Reading ἀσπίδων. The text and the identity of the insect is uncertain, as at 601ᵃ2.
8. Reading ὡς καὶ τῇ φώκῃ.
9. They both walk and swim, or fly and walk.

birds, the pigeon kind, the crane, and the swan (no crook-taloned bird is gregarious); among swimmers, many kinds of fishes—for example, the so-called migratory fishes (the tuna, the young tuna,[10] and the bonito). The human being, however, plays a double game.

The political animals are those among which there is some single work common to all, which is precisely what not all herd animals produce. Of this sort are the human being, the bee, the wasp, the ant, and the crane. Also, of these some are under a leader, while others are without a ruler—for example, the crane and the bee kind are under a ruler, the ants and innumerable others are without a ruler. Among the herd animals and the solitary ones, some stay in one place, while others roam around.

Also, some are carnivorous, others fruit-eating, others omnivorous, while some eat a diet special to them—for example, the bee kind and the spider kind; for bees use honey and a few other sweet stuffs for their nourishment, spiders live by catching flies, and other animals use fish for their nourishment. Again, some catch their nourishment, and some store it up, while others do not.

Also, some have habitations, some are without habitations: having habitations—for example, the mole, the mouse, the ant, the bee; without habitations—many insects and four-footed animals. Further, in their places of habitation, some are hole-dwellers (for example, the lizards and the snakes), others above ground (for example, the horses and the dogs). Also, some are burrowers, others non-burrowers. Also, some are nocturnal (for example, the owl and the bat), others live in daylight.

Further, some are tame, others wild. And some are always so: some always tame (for example, the human being[11] and the mule), some always wild (like the leopard and the wolf), others capable of being quickly tamed (for example, the elephant). Further, there is another way [of dividing them]; for every animal kind that is tame is wild too (for example, the horses, the cows, the pigs, the human beings, the sheep, the goats, and the dogs).

Also, some emit sounds, others are mute, and others have a voice, and of these some have speech, while others are unable to emit articulate sounds; some are vocal, others silent; some are singers, others songless. But it is common to all of them to sing
488b1 or vocalize most around the times of mating.

Also, some live in the fields (for example, the wood pigeon), others in the mountains (for example, the hoopoe), some alongside human beings (for example, the pigeon).

Also, some are lecherous—for example, the partridge kind and the chicken kind; others are inclined to chastity—for example, the raven-like kind of birds; for these rarely mate.

Also, of marine animals, some are deep-sea dwellers, others frequent the shore, others grow on or among rocks.

10. 571a11.
11. Reading ἄνθρωπος.

Further, some defend themselves, others take shelter. The defensive ones are those that, when injured, attack others or defend themselves; while those that take shelter are those that have some place of shelter[12] in themselves against suffering any injury.

Animals also differ in the following ways with respect to character. Some are mild-mannered, spiritless, and non-aggressive (for example, the cow); others are spirited, aggressive, and ineducable (for example, the wild pig); others are practically wise and cowardly (for example, the deer and the hare); others are servile and treacherous (for example, the snake[13]); others free, courageous, and well-bred (for example, the lion); others are true to their stock, wild, and treacherous (for example, the wolf); for an animal is well-bred if it comes from good stock; it is true to its stock in not being a degeneration from its own nature.

Also, some are cunning and malicious (for example, the fox); others are spirited, affectionate, and fawning (for example, the dog); others are mild-mannered and easily tamed (for example, the elephant); others are shy and on their guard (for example, the goose); others are envious and vain (for example, the peacock). But of the animals only human beings are capable of deliberation. Also, many animals share in memory and are capable of being taught, but no other is capable of recollecting except the human being.[14]

About each of the kinds of animals, and about their characters and modes of life, we will speak with exactness later on.[15]

1.2
Parts for Nourishment and Excretion

All animals have in common the parts with which they take in nourishment and the parts they take it into. And these are the same and distinct in the ways described: with respect to form, with respect to excess and deficiency, or by analogy, or differing in position.

In addition to these, most animals have other parts in common with each other as well with which they emit the residue of the nourishment; for not all animals have it. The part with which they take it in is called a "mouth," the one they take it into, a "stomach." The remaining parts have many names. **489^{a}1**

Because the residues are twofold, those animals that have a part receptive of the liquid residue also have one receptive of [that from] the dry nourishment, but those that have the latter do not all have the former. That is why the ones that have a bladder also have a bowel, while those that have a bowel do not all have a bladder (for the part receptive of the liquid residue is named a "bladder," and of the dry, a "bowel").

12. E.g., a shell.
13. Reading ὄφις.
14. *Mem*. 453^{a}9–14.
15. Books 8–9.

1.3
Parts for the Emission of Seed

Many of the remaining animals have these parts, and further, a part by which they emit seed. And of those in which the capacity to generate animals belongs, in one, emission is within the animal itself, in the other, it is within another. The one in which emission is within itself is called the "female," within another, the "male" (in some, there is neither male nor female). Also, the parts that are for this crafting [of animals] differ in form; for one has a uterus, another its analog.[16]

These, then, are the parts most necessary to animals: on the one hand, those that belong to all animals, on the other, those that belong to most.

To all animals only one perceptual modality belongs in common, touch, so that the part in which it naturally occurs is nameless; for it is the same part in some animals, in others the analog.

1.4
Liquid in Animals: Blood and Blood Vessel

Every animal possesses liquid too, and if it is deprived of it, either by nature or by force, it passes away. Further, what it is in is another [part]. In some, this is blood and blood vessel, in others the analog of these. But the latter are incomplete—for example, fiber[17] and serum.

Touch is situated in a uniform part (for example, flesh or something of this sort), and, in general, in sanguineous parts, in those that have blood; in the others, it is situated in their analog, but in all cases in a uniform part. The productive capacities, on the other hand, are situated in the non-uniform parts—for example, the capacity for working on nourishment in the mouth, the one for movement with respect to place in the feet, the wings, or their analog.

In addition to this, some animals are blooded (for example, the human being, the horse, and all those that, when complete, are footless, two-footed, or four-footed), others bloodless (for example, the bee, the wasp, and, of the marine animals, the cuttlefish and the crayfish, and all those with more than four feet).

1.5
Live-Bearing, Egg-Laying, and Larvae-Generating Animals: Feet, Fins, and Wings

Also, some animals are live-bearing, others egg-laying, others larvae-generating. Examples of the live-bearing ones are the human being, the horse, the seal, and all

16. *GA* 754[a]1–2.
17. 515[b]27.

the others that have hair. And, of aquatic animals, the cetaceans (for example, the **489^{b}1**
dolphin), and the so-called selachians. Some of these have a [blowhole] pipe but no
gills (for example, the dolphin and the whale). The dolphin's pipe is through its back,
the whale's is in its forehead. Others have uncovered gills (for example, the selachians, 5
the sharks, and the rays).

Among the embryos that are complete, what is called an "egg" is the one from which the animal offspring comes to be, from one part of which comes the starting-point, while the other is nourishment for the offspring.[18] A larva, on the other hand, is that from the whole of which the whole of the animal comes to be, as the embryo becomes articulated and grows.

Some of the live-bearing animals are internally egg-laying (for example, the sela- 10
chians), others are internally live-bearing (for example, the human being and the horse). What is brought to light when the embryo has reached completion is in some cases a living animal, in some an egg, in some a larva. Among eggs, some are hard-shelled and two-colored (for example, those of the birds), others soft-skinned and single-colored (for example, those of the selachians). And of larvae, some are 15
mobile from the outset, others immobile. But these things must be spoken about with exactness later on in the *Generation [of Animals]*.[19]

Further, some animals have feet, others are footless. Among those having feet, some have two feet (for example, the human being and the bird, and these alone), 20
others four feet (the lizard and the dog), others more (for example, the millipede and the bee). But all have an even number.[20]

Among the swimmers that are footless, some have fins, like the fishes. Among these, some have four fins, two above on the back, two below on the underneath parts (for 25
example, the gilthead and the sea bass), others two only, the ones that are very elongated and smooth (for example, the eel and the conger), others none at all (for example, the muraena and whichever others make use of the sea just as snakes make use of the earth; in fact, in liquid snakes swim in a similar way). Among the selachians, some have no fins (for example, the ones that are broad and long-tailed, like the ray and the stingray) 30
but swim by means of their broad bodies; but the fishing frog does have fins, as do those whose broadness does not thin out to a sharp edge. The swimmers that seem to have feet, like the soft-bodied animals, swim with these and with their fins, and do so faster in the direction of their cavity (for example, the cuttlefish, the large calamary, and the 35
octopus, but neither of the first two walks, as the octopus does). **490^{a}1**

The hard-skinned animals (for example, the crayfish) swim with their tail-parts, but faster in the direction of their tail, with the fins they have on it. And the water newt swims with its feet and tail-parts alike. The water newt has tail-parts that resemble those of the sheatfish, as small compared to great.

18. *GA* 752^{a}10–15.
19. Books 2 and 3.
20. *IA* 708^{a}21–^{b}13.

Among the flyers, some are feather-winged (for example, the eagle and the hawk), others membrane-winged (for example, the bee and the cockchafer), others skin-winged (for example, the flying fox and the bat). Those that are feather-winged are blooded, and the skin-winged ones likewise. The bloodless ones are skin-winged (for example, the insects). And the ones that are feather-winged or skin-winged are all two-footed or footless; for there are said to be certain snakes of this sort around Ethiopia. The feather-winged animal kind is called "bird," the two remaining kinds are not named by one name [each].

Among the flyers that are bloodless, some are coleopterans (for they have their wings in a wing case (*elutron*))—for example, the cockchafer and the dung beetle. Others have no wing case. And of these some are two-winged, others four-winged: four-winged are the ones that are of large size or have their sting in the rear; two-winged are the ones that are not of large size or have their sting in the front. Among the coleopterans, however, none has a sting. The two-winged ones have their stings in the front (for example, the fly, the horsefly, and the gnat).

All the bloodless animals are smaller in size than the blooded ones, with the exception of a few bloodless ones in the sea that are larger (for example, certain of the soft-bodied animals). And the largest of these kinds is in the hottest places, and in the sea rather than on land or in fresh water.

All animals that move around move by means of four or more points of movement. The blooded ones do so by means of four only (for example, the human being does so by means of two hands and two feet, the bird does so by means of two wings and two feet), while four-footed ones use four feet and fishes four fins. Those that have two fins or none at all (for example, the snakes), move by means of four points nonetheless; for their bends are at four points, or at two plus their fins. The bloodless ones that have many feet, whether they are winged or footed, move by means of more than four points of movement—for example, the so-called dayfly does so by means of four feet and four wings; for a special affection of this animal is not only what happens with regard to its lifespan (from which it gets its name) but also that it is both winged and four-footed.

All animals—four-footed as well as many-footed—move in a similar way; for they move with respect to a diagonal.[21] And while the other animals have two feet leading, the crab, alone among animals, has four.

1.6
Kinds of Animals; Simple Forms

The chief kinds of animals, into which the various animals are divided, are these: one for the birds; one for the fishes; another for cetaceans.[22] All these are blooded. Another kind is that of the hard-shelled animals, the so-called shellfish. Another,

21. 498[b]5–7, *IA* 712[a]24–27.
22. Reading κήτους.

that of the soft-shelled animals, which are not named by one name (for example, the crayfish and certain kinds of the crabs and the lobsters); another that of the soft-bodied animals (for example, the small calamary, the large calamary, and the cuttlefish); another that of the insects. All these are bloodless, and the ones that have feet, are many-footed; and some of the insects have wings as well.

Of the remaining animals, there are no chief kinds; for one form does not encompass many forms, but rather in some cases the form is simple and does not exhibit a difference (for example, the human being), other times they do exhibit a difference but the forms are nameless. For the wingless four-footed ones are all blooded, but some of them are live-bearing, others egg-laying. Not all live-bearing ones have hair, but all those that are egg-laying have hard-scales. And a hard-scale has a location similar to that of a soft-scale. Footless by nature, the snake kind is blooded, terrestrial, and hard-scaled. And all the other snakes are live-bearing, the viper alone being egg-laying. For not all live-bearing animals have hair; for certain fishes too are live-bearing. However, those that do have hair are all live-bearing. For we must also consider as a form of hair the sorts of spiny hair that hedgehogs and porcupines have; for these serve the purpose of hair, not of feet, like those of the sea urchins.

Of the four-footed and live-bearing animal kind, there are many forms, but they are without a [common] name, instead each one is spoken of in the way we say "the human being," "the lion," "the deer," "the horse," "the dog," and the others spoken of in this way; although there is actually[23] one single kind in the case of the so-called animals with long hair in their tails—for example, the horse, the ass, the mule, the ginnus, and the ones in Syria called "half-asses," which are called "half-asses" due to a similarity, though they are not unconditionally of the same form; for in fact they mate and generate from each other. That is also why it is necessary to get a theoretical grasp on [the various forms of animals] by grasping the nature of each of them separately.

What has just been said, then, is by way of an outline sketch, a foretaste of the things and affections on which we must get a theoretical grasp. But in what follows we will speak about them with exactness, in order to grasp, first, the differences and coincidental affections of all of them. After that, we should try to discover the causes. For this is the way to make the methodical inquiry in accord with nature, once the investigation of each is already in existence; for the things about which and from which there must be a demonstration become evident on the basis of these.

So first of all we must grasp the parts from which the animals are composed; for it is most of all and primarily with respect to these that the whole [animals] are differentiated, either by having some and not having others, or by their position, or by their order, or by the differences mentioned earlier, those of form, excess or deficiency, analogy, and contrariety among the affections.

First, then, we must grasp the parts of the human being; for just as each group of people evaluates currency in relation to the one best known to themselves, it is

23. Retaining καὶ.

the same way, of course, in other things. But of the animals the human being is of necessity the best known to us.

To perception the parts are not unclear. Nonetheless, for the sake of not neglecting the proper order of exposition, and of having reason together with perception, we must speak first of the instrumental parts, then of the uniform ones.

1.7
The Cranium

Among the parts into which the whole composite body is divided, the chief ones are these: the head, the neck, the thorax, the two arms, and the two legs (the cavity from the neck to the sex organs is called the "thorax").

Among the parts of the head, the one covered with hair is called the "cranium." Of it, the front part is the bregma, which is late in coming to be (for it is the last of the bones in the body to solidify), the back part is the occiput, and the part between the bregma and the occiput is the crown. Under the bregma is the brain, while the occiput is empty. The entire cranium is thin bone, round-shaped, and encompassed by fleshless skin. That of women has one circular suture, that of men for the most part has three sutures, joining together at one point, though a male head having no sutures at all has been observed. The part of the cranium called the "crown" is the middle line where the hair parts. In some cases this is double; for some people are double-crowned, not in virtue of the bone, but in virtue of the parting of their hair.

1.8
Forehead and Face

The part below the cranium, in the human being alone among the animals, is named "the face"; for we do not speak of the face of a fish or of a cow. The part of the face that is below the bregma and between the eyes is the forehead. Those in whom this is large are slower, those in whom it is small, quicker. Those in whom it is broad are excitable, those with a rounded one, contented.[24]

1.9
Eyebrows and Eyes (1)

Below the forehead are the eyebrows, which are naturally a pair. Straight ones are a sign of a soft character, those that bend in toward the nose, of a harsh one; those that

24. Reading εὔκολοι.

bend out toward the temples, of a mocking and self-deprecating one, those that are drawn in toward each other, of an envious one.

Below these are the eyes. They, when in accord with nature, are two. Of these, a part of each is an eyelid above and below. The hairs on their extremities are eyelashes. In the inside of the eye, the liquid part, the one with which we see, is the eye-jelly, and around this is the black, and outside it is the white. The common part of the upper and lower eyelids is a pair of corners, one near the nose, the other near the temples. If these are long, it is a sign of cynicism; if they have a fleshy part near the nostrils, resembling scallops,[25] it is a sign of wickedness.

All other kinds of animals—except the hard-shelled animals and any other kind of incomplete animals—have eyes; and all the live-bearing ones do, except the mole. But one might suppose that in a way it does have them, though not unconditionally. For unconditionally it neither sees nor has eyes that are clearly apparent. But when the skin is taken away, it has a space for the eyes, and has the black parts of the eyes in the place and in the space that is in accord with nature for the eyes when they are outside, suggesting that the eyes are deformed in the process of coming to be and the skin grows over them.

1.10
Eyes (2)

The white of the eye is for the most part similar in all animals, but the so-called black differs; for in some animals it is black, in others very blue, in others bluish-gray, in others greenish. This last is a sign of the best character and is best for sharpness of sight. **492^a1**

The human being is the one that alone—or most of all—among the animals has eyes of many colors. The others have one form. Although some horses have blue eyes.

Some eyes are large, others small, others intermediate in size. The intermediate ones are best. Also, some protrude, others are deep-set, others are intermediate. Among these, the deep-set ones are in all animals the most sharp-sighted; the intermediate a sign of the best character.

Also, they may tend to blink, to be staring, or be intermediate. The intermediate are a sign of the best character, and of the others, the second is a sign of shamelessness, the first of instability.

1.11
Ears, Nose, and Tongue

Further, there is a part of the head, incapable of breathing, through which an animal hears, the ear; for Alcmaeon is not speaking the truth in saying that the goats breathe

25. Reading οἱ κτένες (see *GA* 763^b12).

with their ears.[26] One part of the ear is nameless, the other is the lobe. The whole is composed of cartilage and flesh. The inside has a nature resembling that of spiral shells; the bone that is at the extremity is similar to the ear, and into this, as to the bottom of a vessel, the sound arrives. There is no duct from this to the brain, but there is one to the roof of the mouth, and a blood vessel from the brain extends to it. (The eyes too extend to the brain, and each is situated on a small blood vessel.)

Among the animals that have this part, the human being alone has an ear that is immobile. For of animals that have hearing, some have ears, others do not have them, but that they have the duct is evident—for example, the ones that are feathered or hard-scaled. But all the live-bearing ones—except for the seal, the dolphin, and the other such cetaceans—have ears (for the selachians too are live-bearing). But the human alone does not move them. The seal, then, has visible ducts by which it hears, while the dolphin, though it hears, has no ears. All the other animals move their ears.

The ears are situated on the same circumference as the eyes, and not, as in the case of some four-footed ones, higher up. And of the ears, some are smooth, some hairy, and some intermediate. The last are the best for hearing, but signify nothing about character. Also, they are large, small, or intermediate in size, very prominent, not prominent at all, or intermediate. The intermediate ones are a sign of the best
492b1 character, while large and prominent ones are a sign of a tendency to silly talk and babbling. The part between eye, ear, and crown is called the "temple."

Further, the part of the face that is a duct for breathing is the nose; for one both inhales and exhales through it, and sneezing, which is the expulsion of a gathered mass of breath, occurs through the nose. Among the breaths, sneezing alone is taken as something prophetic and sacred. At the same time, inhalation and exhalation occur in the chest, and it is impossible separately with the nostrils to inhale or exhale, because it is from the chest, along by the uvula, that inhalation and exhalation come, and not from any part of the head. And it is in fact possible to live without making use of this part.

Smelling does take place through this part: it is the perception of odor. The nostril (*muktêr*) is easily moved, unlike the ear, of which being immobile is a special affection. One part of it is a cartilaginous partition, the other an empty passage; for the nostril is cut in half. In the elephants the trunk[27] is long and strong, and it is used as a hand; for by means of this it draws things toward it, grasps them, and conveys nourishment, bold wet and dry, to its mouth, and it alone of the animals does so.

Further, there are two jaws. The front part is the chin, the back part is the cheek. All animals move the lower jaw, except the river crocodile, which moves the upper jaw only.

After the nose are two lips, fleshy and easily movable. The mouth is in the inside of the jaws and the lips. Its parts are the palate and the larynx.

26. Not in the extant fragments, B1–5 DK.
27. Literally, the nostril (*muktêr*).

The part that can perceive flavor is the tongue. Its perceptual modality is in its tip; if something is placed on the broad part, [the flavor] is less. The tongue too perceives all the things that other flesh can perceive (for example, hard, hot, cold) in any part of itself, just as it also perceives flavor. And it is broad, narrow, or intermediate. But the intermediate is the best and most perspicuous [in its discriminations]. Also, it is detached or tightly attached, as in those who mumble or lisp. The tongue is composed of flesh that is soft and spongy. The epiglottis is part of it.

Also, the part of the mouth that is divided in two is the tonsil, and the one that is multiply divided is the gum. These parts are fleshy. In the gums are the teeth, which are bony. **493^{a}1**

In the inside is another part, shaped like a hanging bunch of grapes, a pillar with prominent blood vessels. If when over moistened it gets enflamed, it is called a "bunch of grapes" and causes choking.

1.12
Neck, Thorax, Breasts, and Nipples

The neck is the part between the face and the thorax. Of this, the front part is the larynx, the back part, the gullet.[28] The cartilaginous and front part of this, through which passes the voice and the breath, is the windpipe. The fleshy part is the gullet. It is on the inside, in front of the spinal column. The back part of the neck is the *epomis*.

These, then, are the parts down to the thorax.

Among the parts of the thorax, some are at the front, others at the back. First, then, after the neck, in the front parts, is the chest with a pair of breasts. On these are a pair of nipples, through which in females the milk filters; and the breast is open-structured. Milk is produced in males as well [as females]. But in males the breast is dense, while in women it is spongy and full of ducts.

1.13
The Abdomen and Its (Male) Parts

After the thorax, in the front parts, is the abdomen, and its root is the navel. Below this root, forming a pair, is the flank. The single part under the navel is the lower abdomen (the extreme part of which is the pubic region). Above the navel is the upper abdomen. And the part common to the upper abdomen and the flank is the gut cavity.

A supporting girdle for the back parts is the pelvis (*osphus*). From this indeed its name derives; for it seems to be symmetrical in nature (*isophues*). Of the part for

28. Retaining τὸ δ' ὀπίσθιον στόμαχος.

evacuation, the one that is a sort of seat is the buttock, and the one in which the thigh turns is the hip socket.

A part special to the female is the uterus, while the sex organ is special to the male. It is external, situated at the end of the thorax, in two parts. [Of the one,] one part, the tip, is fleshy, always smooth and (one might almost say) of an equal size, and it is called the "glans," while the other, the skin around it is nameless. (If it is cut, it does not grow back together, any more than does the jaw or the eyelid.) Common to this part and to the glans is the tip of the foreskin. The remaining part is cartilaginous, grows large easily, and gets erect and flaccid in contrary ways.[29]

Below the penis are two testicles. The surrounding skin is called the "scrotum." The testicles are neither the same as flesh nor that far from flesh.

493b1 The way all the parts of this sort are will be spoken about with exactness in universal terms later on.[30]

1.14
Other Parts

The sex organ of a woman is contrary to that of males; for the part below the pubis is hollow and not, as with that of the male, projecting. And there is a urethra outside the uterus, which serves as a passage for the seed of the male, and is an outlet for the liquid residue in both [male and female].

The part common to the neck and the chest is the throat; the part common to the side, arm, and shoulder is the armpit; the part common to the thigh and lower abdomen is the groin. The part inside the thigh and the buttocks is the perineum; the part outside the thigh and the buttocks is the exterior junction of the buttocks and thighs.

The front parts of the thorax have now been talked about. The part behind the chest is the back.

1.15
Trunk and Limbs; Perceptual Parts

The parts of the back are the two shoulder blades, the spinal column, and below, on a level with the abdomen, is the loin. Common to the upper and lower part of the thorax are the ribs, eight on each side. (For about the so-called seven-ribbed Ligurians we have not yet heard anything reliable.)

The human being has an upper and lower part, front parts and back parts, right ones and left ones. The right sides and the left ones are pretty much similar in their

29. Secluding ἢ τοῖς λοφούροις.
30. 3.1 and *GA*.

parts, and the same in all respects, except that the left ones are weaker. The back parts are not like the front ones, nor the lower ones like the upper ones, except for the following points of resemblance: if the face is well supplied with flesh or poorly supplied with flesh, so are the lower parts of the lower abdomen; the legs correspond to the arms, and those that have short upper arms for the most part also have short thighs, and those with small feet, also have small hands.

Of the limbs, one pair are arms. The parts of the arm are the shoulder, the upper arm, the elbow, the forearm, and the hand. Those of the hand: the palm and the five fingers. Those of the finger: the one that bends is the knuckle, the unbendable one, the phalanx. The thumb is single-jointed, the other fingers two-jointed. The bend of both arm and finger is inward in all cases; the arm bends at the elbow. The inside of the hand is the palm, which is fleshy and divided by lines; in long-lived people by one or two going through the whole of it; in short-lived ones, by two, and they do not go through the whole of it. The joint at hand and arms is the wrist. The outer part of the hand, which is sinewy, is nameless.

Among the limbs, another pair are legs. Of the leg, the double-headed part is the thigh bone, the sliding part is the kneecap, the double-boned part, the shank. The front part of the shank is the shin, the back part is the calf, which is flesh that is sinewy and with large blood vessels. In some people (those that have large hips) it is drawn up toward the part behind the knee, in others it is drawn in the contrary direction. At the extremity of the shin is the ankle, a pair in each of the two legs. The many-boned part of the leg is the foot. The back part of the foot is the heel, and the front part is divided into five toes; the fleshy underneath part is the ball of the foot; the upper part at the back is sinewy and nameless. Of the toe, one part is the nail, the other the bend [or joint]. In all cases, the nail is at the extremity, and in all the toe is single-jointed. In those people the inside [or sole] of whose foot is thick and not arched, and so walk on the whole of it, are unscrupulous. The bend common to thigh and shank is the knee.

These, then, are the parts common to female and male.

The position that the parts have in relation to up and down, front and back, and right and left, might seem to be evident on the basis of perception as regards the external ones. Nonetheless, it must be spoken about due to the same cause as precisely the one due to which we also spoke about the previous parts: that is, so that the exposition be brought to an end in proper order, and that, by enumerating them, we are less likely to overlook those that are not the same way in the case of the other animals as in the case of human beings.

It is in the human being above all other animals that the upper parts and the lower parts are determined in relation to the places that are in accord with nature; for the upper parts and lower parts are positioned in relation to the upper and lower parts of the universe.[31] In the same way too the human being has the front parts and the

31. *DA* $416^{a}2$–5, *IA* $705^{a}32$–$^{b}2$.

back parts, the right parts and the left parts, in accord with nature. Among the other animals, some do not have them, while others, while they do have them, have them in a more indistinct way. In all cases the head is up above in relation to the animal's own body. But only the human being, as was said, when completed, has this part up above in relation to the universe.

494ᵇ1 After the head is the neck, then the chest and the back, the one in front, the other behind. And after these are the abdomen, the loin, the sex organ, and the haunch; then the thigh, the shank, and lastly the feet. Toward the front too is the bend the legs have, which is also the direction of their progression, as well as of the more mobile part of the foot and its bend; the heel is at the back and each of the two ankles correspond to the ears. On the sides, right and left, are the arms, which have their bend inward, so that the convexities of the bent legs and bent arms face each other most of all in the human being.

The perceptual modalities and the perceptual organs—the eyes, the nostrils, and the tongue—all face in the same direction and are had at the front. But the capacity of hearing and its perceptual organ, the ears, are at the side, though on the same circumference as the eyes. Among the animals, the eyes are least far apart in the human being, for its size. And the human being has the most exact perception of touch, and the second most of taste. But in the others it falls short of many animals.

1.16
The Internal Parts

The parts visible on the outside surface of the body, then, are arranged in this way, and, as was said, they are mostly distinguished by name and are known through intimacy with them. The inner parts, however, are the contrary. For the inner parts of human beings are especially unknown, so that we must refer our investigation to those of the other animals that have a nature that is much the same.

First, then, situated in the head, and having a position in the front, is the brain. And it is likewise too with whatever other animals have this part. And all the ones that have blood have it, and furthermore so do the soft-bodied animals. But, among animals of the same size, it is the human being that has the largest and wettest brain. Two membranes encompass it, the one around the bone is stronger, the one around the brain itself less strong than the former. In all animals the brain has a pair of parts. Behind this, at the extremity, is what is called the "cerebellum," which has a shape that to both touch and sight is distinct.

The back of the head is empty and hollow in all animals, in keeping with the size **495ª1** that each has. For some have a large head, but the part of the face below is comparatively small (the ones that are round-faced), while others have a small head and long jaws (for example, all of the kind with long hair in their tails).

The brain is bloodless in all animals, that is, it has no blood vessels in it at all, and is naturally cold to the touch. It has at its center in most animals a small hollow. The meninx around the brain has large blood vessels (the meninx is the skin-like membrane that encompasses the brain). Above the brain is the thinnest and weakest bone in the head, which is called the "bregma."

From the eye three ducts lead to the brain, the largest and the middle one to the cerebellum, the smallest to the brain itself; the smallest is the one nearest the nostril. The largest ones are parallel and do not meet, but the middle ones do meet (this is especially clear in the case of the fishes); for these are also nearer the brain than the large ones are. The smallest ones are farthest apart from each other and do not meet.

In the inside of the neck is the so-called esophagus—which gets its derived name [*stomachos* ("gullet")] from its length (*makros*) and narrowness (*stenos*)—and the windpipe. The windpipe is situated in a position in front of the esophagus, in all animals that have it; and the ones that have it are precisely all the ones that have a lung. The windpipe is cartilaginous in nature and has little blood, but it is encompassed by many small thin blood vessels. It is situated, in its upper part, near the mouth, below the aperture from the nostrils to the mouth, where too, when people are drinking and they inhale some of their drink, it advances from the mouth out through the nostrils. Between the two apertures is what is the so-called epiglottis, which is capable of being folded over the aperture that leads to the mouth. The extremity of the tongue is attached to it. At the other end the windpipe comes down to the middle of the lung, then from there it divides, going to each of the two parts of the lung. For the lung tends to have two parts in all the animals that have it. But in the live-bearing animals the division is not evident to the same degree, and is least so in the human being. And it is not multi-divided in the human being, as in some of the live-bearing **$495^{b}1$** animals, nor is it smooth, but rather exhibits unevenness.

In the egg-laying animals (for example, the birds and in those four-footed ones that are egg-laying), the two parts are quite separate from each other, so that they seem to have two lungs. And from the single windpipe there are two parts, one extending to each of the two parts of the lung. It is also attached to the great blood vessel and to the so-called aorta.

When the windpipe is inflated, the breath is distributed to the hollow parts of the lung. These have cartilaginous partitions that meet at an acute angle. And from the partitions there are apertures going through the entirety of the lung, which are always so distributed that smaller ones follow larger ones.

The heart too is attached to the windpipe, by fatty, cartilaginous, and fibrous ligatures; and at the point of attachment, it is hollow. And when the windpipe is inflated, though in some animals this is not made visible, in the larger animals it is clear that the breath enters into it.

The windpipe, then, has this mode of arrangement, and only takes in and emits breath, but takes in nothing else, whether dry or wet, or else produces pain, until one coughs up what has gone down it.

The gullet is attached at the top to the mouth, contiguous to the windpipe, and conjoined with the spinal column and the windpipe by membranous ligatures, ending, by way of the diaphragm, in the stomach. Its nature is fleshy and it has elasticity both in length and in breadth.

The stomach of the human being is similar to that of the dog; for it is not much larger than the intestine, but rather is like a sort of intestine that has a certain size. Next is the simple intestine, which spirals; next the intestine having breadth.[32] The lower part of the bowel[33] is similar to that of the pig; for it is large, and the part going from it to the fundament is thick and short. The omentum[34] is attached to the middle of the stomach, and has the nature of a fatty membrane, just as in the other single-stomached animals that have two rows of teeth.

Above the intestines is the mesentery. This too is membranous and large and becomes fatty. It is attached to the great blood vessel and to the aorta, and throughout it are many blood vessels densely packed together, which extend to the position of the
496ᵃ1 intestines, starting above and continuing to down below.

Things having to do with the gullet, the windpipe, and the stomach, then, stand this way.

1.17
Heart and Viscera

The heart has three cavities, is situated above the lung at the point where the windpipe divides into two, and it has a membrane that is fatty and dense where it is attached to the great blood vessel and the aorta. And it is situated with its pointy end on the aorta. And its pointy end is situated toward the chest, alike in all animals that have a chest. And in all animals, alike in both those that have and those that do not have this part, the heart has its pointy end turned toward the front, though this may often escape notice because of its migration during dissection. The rounded end of it is at the top. The pointy end is fleshy in most cases and dense, and there are sinews present in its cavities. While it is situated in the middle of the chest in the other animals (the ones that have a chest), in human beings its position is more in the left, leaning a little away from the division of the breasts toward the right breast, at the upper part of the chest.

Also, the heart is not large, and its form as a whole is not elongated but roundish, except for the extremity where it comes to a point. It has three cavities, as was just said, the largest is on the right, the smallest on the left, and the medium-sized one in the middle. All of them, even the two smaller ones, are connected to the lung by

32. Reading εἶτα ἕντερον εὖρος ἔχον.
33. Or "stomach."
34. *PA* 677ᵇ17–21.

passages,[35] though quite visibly so [only] with regard to one of the cavities. Below, at the point of attachment, from the largest cavity, the heart is attached to the great blood vessel, near where the mesentery is, and from the middle one to the aorta.

Ducts also lead to the lung from the heart, and divide in two just as the windpipe does, following over all the lung the paths of those from the windpipe. Uppermost are the ones from the heart. There is no common duct, but because of their contact they take in the breath and transmit it to the heart; for one of the ducts leads to the right cavity, the other to the left.

About the great blood vessel and the aorta by themselves we will speak in common later on.[36]

Among the parts present in the animals that both have a lung and are internally and externally live-bearing, the lung has the most blood; for the entirety of it is spongy, and along the bronchial passages, ducts bring the blood of the great blood vessel. But those who consider the lung to be empty are entirely deceived, because of looking at ones that have been removed from animals during dissections, from which the blood has immediately all withdrawn at once. **496^{b}1**

Among the other viscera, the heart alone has blood. And the lung has it not within itself but in its blood vessels, while the heart has it within itself; for it has blood in each of its cavities, and the finest-grained is in the middle one.

Below the lung is the thoracic diaphragm, the so-called midriffs, which are attached to the ribs, the upper abdomen, and the spinal column, and in the middle has something thin and membranous. It has blood vessels extending through it. The midriffs of the human being are thick in proportion to his body.

Below the diaphragm on the right side the liver is situated, and on the left the spleen, and likewise in all animals that have these parts in accord with nature and not in a monstrous way; for cases have been observed in certain four-footed animals in which the positions are exchanged. They are connected to the stomach through the omentum.

In appearance the spleen of the human being is narrow and long, similar to that of the pig. And the liver for the most part, and in most animals, has a gallbladder, but in some animals it does not. The liver of the human being is roundish, similar to that of the cow. (This absence of the gallbladder is also met with in sacrificial animals—for example, in a certain place in Chalcis in Euboea the sheep do not have a gallbladder, while in Naxos pretty much all the four-footed animals have one so large that strangers when offering sacrifice get quite a shock, thinking the [large gallbladder] to be a sign special to themselves, not that this is the animal's nature.)

The liver is attached to the great blood vessel, but has no communication with the aorta; for the blood vessel from the great blood vessel traverses the liver at a point

35. Reading ἁπάσας δ' ἔχει, καὶ τὰς δύο μικράς, εἰς τὸν πλεύμονα τετρημένας.
36. *HA* 3.3–4, *PA* 3.5.

called the liver's "portals." The spleen too is connected to the great blood vessel alone; for a blood vessel extends from it to the spleen.

After these are the kidneys, situated near the spinal column, and similar in nature to those in cows. The right one is higher up in all the animals that have kidneys. And the right one also has less fat than the left and is drier. And it is this way in all the other animals too. Ducts lead to them from the great blood vessel and from the aorta, though not into the cavity. For the kidneys have a cavity in the middle, some a larger one, some a smaller one, except for those of the seal; for these are similar to those of cows, but are most solid of all.

The ducts extending to the kidneys lose themselves in the body of the kidneys. A sign that they do not penetrate [the cavity] is that the kidneys do not have blood, nor does it coagulate in them. And they have a small cavity, as was just said. And from the cavity of the kidneys two sturdy ducts lead into the bladder. Others come from the aorta that are strong and continuous. At the middle of each of the two kidneys is attached a hollow and sinewy blood vessel that extends along the spinal column itself through the narrow regions, then they disappear into either haunch, and become clearly visible again in extending to the haunch. These branches of the small blood vessels reach down in due course to the bladder.

For the bladder is situated at the extremity, having an attachment there via the ducts that extend from the kidneys along the stalk that extends to the urethra, and pretty much all around it is fastened by thin sinewy membranes that are in a certain way much the same as the thoracic diaphragm. In the human being, the bladder has moderate size.

To the stalk of the bladder is attached the penis; the outermost aperture encounters at the same point another one [of two], which is smaller and lower down. One of the apertures leads to the testicles, the other to the bladder. [The penis] is sinewy and cartilaginous. To this, in males, the testicles are attached. The way they have these will be determined in the common accounts.[37]

In the female too all the parts are naturally the same way; for it does not differ in the internal ones, except for the uterus, the visual appearance of which one must observe with the help of the diagrams in the *Dissections*. Its position is over the bowel. And over the uterus is the bladder. But the uterus too in all animals in common must be spoken about in what follows; for it is neither similar in all of them nor is it possessed in a similar way.

The parts, then, of the human being, both the internal ones and the external ones, are these and of this sort, and it has them in this way.

37. The reference is presumably to *HA* 3.1, where the accounts are "common" because dealing with the testicles in all animals that have them, not (as here) just in human beings.

BOOK 2

2.1
Differences between the Animals, Their Parts, and Their Movements

Among the parts of the other animals, some are common to all, as was said previously,[38] others to certain kinds. And these are the same or different from each other in the way that has already often been stated. For in the case of pretty much all the animals that are in distinct kinds, the majority of their parts are distinct in form too, and some are undifferentiated by analogy only, but distinct in kind, while others are the same in kind but distinct in form. But many parts belong to certain animals and not to others.

Thus, the live-bearing four-footed animals all have a head, a neck, and all the parts that are in the head, but each of these parts differs with respect to shape. The lion, for example, has a neck consisting of one bone, and has no vertebrae; but, when it is opened up, all its internal parts are like those of a dog.

The live-bearing four-footed animals also have front legs in place of arms. But, though this is the case for all four-footed animals, the multi-split-footed ones have their front legs most analogous to hands—for they are used as hands for many things (and the ones on the left are less differentiated [from the right] than in human beings)—with the exception of the elephant. This latter has parts around the toes that are more without joints, and its front legs are much larger; it has five toes and on its hind legs has short ankles. Its trunk, however, is of such a sort and of such a size that it has it in place of hands; for with this instrument, it drinks and eats by putting things into its mouth, and hands them up to the elephant-driver on its back. It even pulls up trees with it and, when walking through water, blows it upward with this. It coils at its tip, but does not bend; for it is cartilaginous.

But among the various animals only a human being can actually become ambidextrous.[39]

All animals have a part analogous to the human chest, but not similar to it; for the human chest is broad, while those of the others are narrow. And none have breasts in the front except the human being; the elephant does have two breasts, but they are not on the chest, but near the chest. **498^{a}1**

And all animals, with the exception of the elephant, have the bends both of the front limbs and the back limbs set opposite to each other and to the bends of the human being. For in the live-bearing four-footed animals the front limbs bend forward and the back ones bend backward, and have the concavities of the curves turned toward each other. The elephant does not behave as some people said, but settles

38. 1.1.
39. *NE* $1134^{b}34$, †*MM* $1194^{b}33$–39, *Pol.* $1274^{b}13$.

down and bends its legs, except that it cannot, because of its weight, do so on both sides at the same time, but reclines either on its right side or on its left, and goes to sleep in this position. On the other hand, it bends its back legs precisely the way a human being does.

In the case of the egg-laying animals, like the crocodile, the lizard, and all the animals of this sort, both pairs of legs, both the front ones and the back ones, bend forward, with a slight inclination to the side. It is likewise in the case of the various many-footed animals, except that the legs between the extreme ones always play a double game,[40] and so bend more sideways. In the case of the human being, by contrast, the bends of both pairs of limbs are set toward the same point, that is, in contrary directions; for it bends the arms toward the back (except that there is a slight turning inward), and the legs toward the front. No animal at all bends both its front legs and its back legs backward. But in the case of all animals the bend of the shoulders is in a contrary way to that of the elbows or the joints of the front legs, and the bend of the hips to that of the knees of the back legs, so that, since the human being bends his limbs in the contrary way to most[41] animals, those that possess joints of this sort[42] bend them in the contrary way too.

The bird too has bends that are much the same as those of the four-footed animals; for, though it is two-footed, it bends its legs backward, and in place of arms (that is, front limbs), it has wings, of which the bend is forward.

As for the seal, it is a sort of deformed four-footed animal;[43] for it has feet immediately after the shoulder blade that are similar to hands, like those of the bear; for each has five toes, and each of the toes has three bends and a nail that is not large. The back feet also have five toes, and have bends and nails similar to the front feet, but in shape they are much the same as the tails of fishes.

The movements of animals, both of four-footed ones and of many-footed ones, are diagonal, and they stand still in the same way; and in all of them the starting-point [of movement] is from the feet on the right. But the lion and the two sorts of camel, the Bactrian ones and the Arabian ones, walk laterally.[44] And lateral walking is when the right foot does not go before the left, but instead follows along with it.

Whatever parts the human being has in the front, the four-footed animals have below, on the underneath parts, and the ones it has behind, they have on their back parts. Further, most of them have a tail; for even the seal has a small one, similar to that of the deer. (About the apelike animals we will make determinations later.[45])

All the live-bearing four-footed animals are (one might almost say) hairy, not like the human being, who is sparse-haired and short-haired except for his head—though

40. I.e., they share in the bends of both the front and the back legs.
41. Reading πολλοῖς.
42. Reading τὰ τοιαῦτα.
43. *PA* 657a23–25.
44. 629b14.
45. 2.8.

among the animals it has the hairiest head.[46] Further, among the various hairy animals, the back is hairier, but their underneath parts are either altogether hairless or less hairy. With the human being it is the contrary. The human being also has eyelashes on both lids, and has hair in the armpits and the pubic region, while none of the other animals has it in either of the latter places, or has a lower eyelash—though some animals have some sparse hair growing under the eyelid.

Among the four-footed animals themselves that have hair, some are hairy all over the body, like the pig, the bear, and the dog; others are especially and similarly hairy all around the neck—for example, those that have a mane, like the lion; others are especially hairy on the upper surface of the neck from the head as far as the withers—for example, those that have a crested mane, like the horse, the mule, and—among the wild horned animals—the bison.

The so-called horse deer[47] also has a mane on its withers, as does the beast named the *pardion*;[48] each of the two has a mane of fine hair extending from the head to the withers; but special to the horse deer is having a beard by the larynx. Both these animals are horned and split-footed, but the female horse deer does not have horns. **499^{a}1** The size of this animal resembles that of the deer. The horse deer live in Arachotae, precisely where the wild cattle also live. (Wild cattle differ from tame ones in very much the way wild pigs differ from tame ones, for they are black, strong in form, with a hooked muzzle, and with horns lying more over the back.) The horns of the horse deer are much the same as those of the gazelle.

The elephant is the least hairy of the four-footed animals.

The hairiness or hairlessness of the tails follow along with those of the body in whatever animals have a long tail; for some have an altogether small one.

Camels[49] have a special part in comparison to the other four-footed animals, the so-called hump on the back. But the Bactrian camels differ from the Arabian ones; for the former has two humps, the latter only one—although it has another hump below like the one above, on which, when it kneels down, the rest of the body is supported. The camel has four nipples like the cow, a tail like that of an ass, and its sex organ is at the back. It has one knee on each leg, which does not have several bends, as some people say,[50] but appears to because of the lower part[51] of its stomach. It has a knucklebone[52] like that of a cow, but meagre and small for the animal's size. It is split-footed and does not have two rows of teeth. It is split-footed in the following way: there is a small split that starts from the back and goes up to the second joint of the toes; in the front there is a small split as far as the first joint of the toes up to the

46. *PA* 658^{b}2–10.
47. Probably the nilgai, a large short-horned Indian antelope.
48. Perhaps the giraffe or the gazelle.
49. In particular, female camels.
50. E.g., Herodotus 3.103.
51. Reading ὑπόστασιν.
52. *PA* 654^{b}20–23.

extremities of the four feet; and there is something in the middle of splits as in the case of geese. The foot is fleshy underneath, like those of the bear; that is why the ones going to war have leather boots [put on] when their feet get sore.

All the four-footed animals have legs that are bony, sinewy, and fleshless. And, in general, it is so for all other animals too, except the human being. Further, they lack buttocks; and indeed the birds have this affection to a yet higher degree. But with the human being it is the contrary; for the parts of the body that are pretty much the most fleshy are the buttocks, thighs, and shanks. For the so-called calves in the shanks are fleshy.

Among the blooded live-bearing four-footed animals, some have multi-split feet, like the hands and feet of the human being (for some have many toes—for example, the lion, the dog, and the leopard); some have split feet with hooves in place of nails, like the sheep, the goat, the deer, and the hippopotamus; and some have unsplit feet—for example, the solid-hoofed ones, like the horse and the mule. The pig kind plays a double game; for there are solid-hoofed pigs in Illyria, Paeonia, and elsewhere. The cloven-hoofed animals have two splits at the back; but in the solid-hoofed ones this part is continuous.

Again, some animals are horned, others hornless. Most of the horned ones have, in accord with their nature, cloven hooves—for example, the cow, the deer, and the goat; a solid-hoofed two-horned one has never been seen. But there are a few one-horned solid-hoofed ones—for example, the Indian ass.[53] The oryx[54] is one-horned and cloven-hoofed.

The Indian ass is also the only solid-hoofed animal with a knucklebone; for the pig, as was said previously,[55] plays a double game, which is why it does not have a well-formed knucklebone. Many of the cloven-hoofed animals have a knucklebone. No multi-split-footed animal has been seen to have this sort of knucklebone, any more than a human being; but the lynx has something like a hemi-knucklebone, and the lion has one very much like the labyrinthine shape they use in molding.[56] All those that have a knucklebone have it in the back legs. The knucklebone is set upright in the joint, with the upper part outside and the underneath part inside; the sides called "Coan" are inside, facing each other, those called "Chian" are outside, and the "horns" are on the top.[57] The position, then, of the knucklebones in the case of all the animals that have them is this way.

Some animals have, at the same time, cloven hooves, a mane, and two horns bent toward each other—for example, the bison that live around Paeonia and Maedica. All the horned animals are four-footed, except for one said to have horns metaphorically,

53. The Indian rhinoceros.
54. Probably a sort of antelope (but not one-horned).
55. 499ᵇ12.
56. An *astragalos* is both a knucklebone and a sort of molding on the capital of an Ionic column.
57. The terms come from the game of knucklebones.

by a figure of speech—as the snakes around Thebes are said to be by the Egyptians, when what they have is a protuberance that occasions the description. Among the ones having horns, only the deer's are solid throughout, others are hollow up to a point, while the extremity is solid. The hollow part more naturally stems from the skin, although the solid part fastened around this stems from the bones—for example, the horns of cows. The deer alone sheds its horns each year, starting from its second year, and then grows them again. The others have them in a continuous way, unless they are docked by force.

Further, the breasts and the instruments used for mating belong in contrary ways in the other animals both in relation to themselves and in relation to the human being. For some have their breasts in the front, on the chest or near the chest, and have two breasts and two nipples, like a human being and an elephant, as was said previously.[58] For in fact the elephant has the two breasts near the axillae, and the female has altogether small breasts and not ones in proportion to the body, so that from the side they cannot be seen at all. The males also have altogether small breasts like the females. The female bear has four. Some animals have two breasts, but near the thighs, and two nipples, like the sheep; others have four nipples, like the cow. Some have breasts neither on the chest nor near the thighs, but on the abdomen—for example, the dog and the pig—and have many of them, but not all of equal size. While others have numerous ones, the female leopard has four on the abdomen, and the lioness two on the abdomen. The camel also has two breasts and four nipples, like the cow. Among the solid-hoofed animals, the males do not have breasts, except for those that bear a likeness to the mother, which is precisely what happens in the case of horses.[59]

Some males have their sex organs external (for example, the human being, the horse, and many others), others internal (for example, the dolphin). And among those that have them externally, some have them in the front (like the ones mentioned), and, among these, some have both the sex organ and the testicles detached (for example, the human being), others have the sex organ and the testicles close to the abdomen, some more, some less detached; for this part is not equally detached in the boar and the horse. The elephant has a sex organ like that of the horse, but small and not in proportion to the body, and the testicles are not visible externally, but are inside near the kidneys; that is why in mating it gets off quickly. The female has the sex organ in the place where the udder is in sheep. When she is getting ready to mate, she draws it back and turns it toward the external place, so that mating is easier for the male; and the sex organ opens wide. These are the ways, then, that the sex organs are in most animals.

Some animals urinate backward—for example, the lynx, the lion, the camel, and the hare. Male animals, as was said,[60] do so in contrary ways from each other, but all

58. $497^{b}34$–$498^{a}2$.
59. *PA* $688^{b}33$.
60. *PA* $689^{a}31$–35.

the females urinate backward; for even the female elephant, though having[61] the sex organs below the thighs, also does so just like the others.

Among sex organs there is much difference. For some animals have a sex organ that is cartilaginous and fleshy, like the human being; and the fleshy part does not become inflated, but the cartilaginous part can increase in size. In some, it is sinewy, as in the camel and the deer, while in others it is bony, as in the fox, the wolf, the marten, and the weasel; for in fact the weasel has a bone for a sex organ.

In addition to these things, when the human being is completely grown, the upper part is smaller than the lower, while with the other blooded animals it is the contrary. By the "upper" we mean the region from the head to the part for the outlet of the residue; by "lower" we mean the rest of the body from there. In footed animals, then, the back leg is lower in relation to their [overall] magnitude, and in footless ones, their tails, caudal appendages, and parts of this sort.

When they are completely grown, then, animals are like this, but in the process of growing they differ; for the human being, when young, has the upper part larger than the lower, but as he grows, he changes to the contrary (that is also why he alone
501ᵃ1 does not make the same progressive movement when young as when completely grown, but in first infancy crawls on all fours). Some animals exhibit the same relative proportions as they grow—for example, the dog. Some animals at first have the upper part smaller and the lower one larger, but as they grow the upper one becomes greater—for example, those with long hair in their tails;[62] for in none of these does the part between the hoof and the haunch become larger.

Again, as regards the teeth, there are many differences between the various animals both in relation to each other and in relation to the human being. For all blooded live-bearing four-footed animals have teeth. But, first, some have two rows of teeth and some do not have two rows of teeth. For those that are horned do not have two rows of teeth; for they do not have their front teeth in the upper jaw. And there are some that do not have two rows of teeth and are hornless—for example, the camel. And some have tusks (for example, the boar), while others do not. Further, some of them are sawtoothed (for example, the lion, the leopard, and the dog), while others have non-interlocking teeth (for example, the horse and the cow); for the sawtoothed ones are those whose sharp teeth interlock. No animal has both tusks and horns at the same time; nor does any sawtoothed one have either of these. Most animals have their front teeth that sharp, and their inner ones broad. The seal is sawtoothed as regards all its teeth, because it overlaps with the fish kind; for pretty much all the fishes are sawtoothed.

No animal of these kinds has double rows of teeth. But there is one, if we are to trust Ctesias; for he says that a beast in India, the name of which is "martichoras," has a triple row of teeth in both jaws; that it is as large as a lion, is equally hairy, and has similar feet; that its face and ears are like a human being's, its eyes blue, and its color

61. Reading καίπερ ἔχων.
62. 491ᵃ1.

vermillion; that its tail is like that of the terrestrial scorpion; that it has a sting in the tail, with spines that it can shoot off like javelins; that its voice sounds at the same time like a pipe and a trumpet; that it can run no less fast than a deer; and that it is savage and man-eating. **$501^{b}1$**

The human being sheds its teeth, and other animals shed them too—for example, the horse, the mule, and the ass. The human being sheds its front teeth, but no animal sheds its molars. The pig sheds none of its teeth at all.

2.2
The Teeth of Dogs

About dogs there are disputes: some think that they shed absolutely none of their teeth, some that they shed only the canines; yet it is seen that they do shed them, just as the human being does, but this escapes notice because they do not shed them until equivalent ones grow up as a substitute inside. It is likely that something similar also occurs in the case of the other wild beasts, since they are said, at any rate, to shed only the canine teeth. People distinguish young dogs from old ones by their teeth; for the young ones have white sharp teeth, while the old have black blunt ones.

2.3
The Teeth of Horses

In the case of horses too the contrary occurs to what occurs in the other animals; for as the other animals become older they have blacker teeth, while the horse has whiter ones.

The so-called canines mark the boundary between the sharp teeth and the broad ones, participating in the shape of both; for they are broad below and sharp above.

Males have more teeth than females both in human beings and in sheep, goats, and pigs. In the case of the others, the issue has not yet been looked into. But the ones that have more teeth are for the most part longer-lived, while those with fewer and more widely spaced teeth are for the most part shorter-lived.

2.4
Wisdom Teeth

In human beings, the last teeth to grow are molars, so-called wisdom teeth, which do so around the age of twenty both in men and in women. In women of eighty years, cases have been observed of molars coming in at the extremities [of the jaws], causing pain while growing in, and likewise in the case of men. This occurs in those whose wisdom teeth did not grow at the proper age.

2.5
The Teeth of Elephants

30 The elephant has four teeth on each side with which it masticates its nourishment (grinding it like coarse barley meal), and separate from these it has two others—the great ones.[63] The male has these large and curved upward, the female has them small
502a1 and going contrary to those of the males; for the teeth look downward. The elephant has teeth right from birth, however, the great ones are invisible at first.

2.6
The Tongue of Elephants

The elephant has a very small tongue and placed [well] inside, so that it takes work to see it.

2.7
The Size of Mouths

5 The animals also differ in the size of the mouth. For some have mouths that open wide (like the dog, the lion, and all the sawtoothed animals), others have small mouths (like the human being), others have intermediate-sized ones (for example, the pig kind).

10 {The Egyptian hippopotamus has a mane like a horse, is cloven-hoofed like a cow, and is snub-nosed. It has a knucklebone like the split-footed animals, tusks that are barely apparent, the tail of a pig, and the voice of a horse. Its size is the size of an ass. The coarseness of its skin is such that spear shafts are made from it. Its internal parts
15 are like those of the horse and the ass.}[64]

2.8
The Apes (1)

Some of the animals have a nature that plays a double game with that of the human being and that of the four-footed animals—for example, the apes, the monkeys, and the baboons. The monkey is an ape with a tail. The baboons, for their part, have the same shape as the monkeys, except that they are bigger and stronger and have faces
20 more like a dog's; further, they are more savage in character and have teeth that are more like a dog's and stronger.

63. I.e., the tusks.
64. The paragraph is closely similar to Herodotus 2.71 and may be an interpolation.

The apes are hairy on the back, as being four-footed, and on the underneath parts, as being like human beings (for human beings have this in the contrary way to the four-footed animals, as was said previously[65]), except that the hair is coarse, and that the apes are very hairy on both sides. The face has many similarities to that of the human being; for it has nostrils, ears, and teeth—both front and molars—that are much the same as those of the human being. Further, while other four-footed animals do not have lashes on both eyelids, the ape does, though they are very fine and altogether small, especially the lower ones; for in fact the other four-footed animals do not have these.

Further, the ape has on its chest two nipples on small breasts. It has arms like the human being, except hairy, and it bends these and its legs as the human being does, with the convexities of both limbs facing each other.[66] In addition, it has hands, fingers, and nails like those of the human being, except that all these tend to be more beastlike. Its feet are special to it; for they are like large hands, and the toes are like fingers, the middle one being longest; and the bottom of the foot is like a hand, except that it is longer than the bottom of the hand, and stretches toward the extremities, just like a palm; it is harder at the end, and in a poor and indistinct way imitates the heel. It uses its feet in two ways, both as hands and as feet, and bends them like hands. Its upper arm and thigh are short in relation to the lower arm and shank. It does not have a protruding navel, but something hard in the navel's place. It has a much larger upper part than a lower,[67] like the four-footed animals; for the ratio is pretty much five to three. And because of these things, and because it has feet that are like hands, and are composed, as it were, of hand and foot (of foot as regards the extremity of the heel, of hand as regards the other parts, for even the toes have a so-called palm), it spends most of its time on all fours rather than upright. It has neither buttocks (as being four-footed) nor tail (as being two-footed), except for an utterly small one, just enough for a sign of one. The female has a sex organ like that of a woman, while the male has one that is more like that of a dog than that of the human being.

2.9
The Apes (2)

The monkeys, as was said previously,[68] have a tail. But all the animals of this sort have internal parts, when dissected, that are like those of the human being.

These, then, are the ways the parts are in the externally live-bearing animals.

65. $498^{b}19–21$.
66. $498^{a}19–22$.
67. $500^{b}28–30$.
68. $502^{a}18$.

2.10
The Blooded Egg-Laying Four-Footed Animals

The four-footed animals that are egg-laying and blooded (and no terrestrial blooded animal is egg-laying unless it is four-footed or footless) have a head, a neck, a back, the back and underneath parts of the body, front and back legs, and an analog of the chest, just as the live-bearing four-footed ones do, and most have a long tail, while a few a short one. And all animals of this sort are many-toed and multi-split-footed. In addition, they all have perceptual organs and a tongue, except for the Egyptian **503a1** crocodile. (This one is much the same way as that of certain fishes; for in general the fishes have a tongue that is prickly and not detached, while some have this place altogether smooth and undifferentiated unless one opens their mouth very wide [to look inside].)

All the animals of this sort have no ears, but only the duct for hearing, no breasts, no sex organ, no evident external testicles, but internal, and no hair; but all are hard-scaled. Further, they are all sawtoothed.

River crocodiles have the eyes of a pig, but large teeth, and tusks, strong nails, and a skin that is impermeable and hard-scaled. They see poorly in water, but with great acuity outside it. Mostly, they spend the day on the land and the night in the water; for it is warmer than the open air.

2.11
The Chameleon

The chameleon has a body shaped generally like a lizard's, but the ribs come down and meet near the lower abdomen, as with the fishes, and the spinal column sticks up as with the fishes. The face is very like that of the baboon. It has a very long tail that comes to a fine point and is coiled up to a great extent, like a leather thong. It stands higher off the ground than the lizards, but it has a bend of the legs like that of the lizards. Each of its feet is split into two parts, which have a relation to each other corresponding to the one our thumb has to the rest of the hand. And each of these parts is divided for a short distance into a certain number of toes: on the front feet, the inside part is divided into three and the outside part into two, while on the back feet, the inside part is divided into two and the outside into three. The fingers have nails like those of the crook-taloned birds.

Its body is rough all over, like that of the crocodile. It has eyes situated in a hollow recess that are very large, round, and surrounded by skin that is like the rest of the body. In the middles of these small apertures have been left for vision, through which it sees. This aperture is never covered with skin. It turns its eye **503b1** circularly, changes the direction of its vision toward every place, and in this way sees what it wishes.

The change of its color occurs when it becomes inflated with air. It has a color that is black, not far removed from that of the crocodile, yellow like the lizards, black-spotted like the leopards. This sort of change occurs over its whole body; for the eyes also change in a similar way along with the rest of the body, also the tail. Its movement is exceedingly sluggish, like that of the turtles. When dying, it becomes yellow, and its color is like this once it is dead.

The gullet and the windpipe are situated like those of the lizards, but there is no flesh anywhere, except for a few bits of flesh on the head, jaws, and around the extremity where the tail grows. It has blood only around the heart, the eyes, the place above the heart, and in the small blood vessels extending from these; but even there it is in altogether short supply.

The brain is situated slightly above the eyes, but is continuous with them. When the outer skin of the eyes is removed, they have something that surrounds them and shines through them, like a thin copper ring.

Over pretty much all of its body membranes extend that are both numerous and strong, far more so than those in the rest of the animals. And it is even active with its breath for a long time after being cut open along its whole length, there being still a very slight movement in it around the heart, and though the contraction is particularly in the parts around the ribs, nonetheless it is also in the rest of the parts of the body.

It has no visible spleen.

It goes into hiding like the lizards.

2.12
The Birds

The birds too have some parts in a similar way to the animals that have been spoken about; for all of them have a head, a neck, a back, underneath parts, and an analog of the chest. They have two legs—[in this respect] are the animals most like a human being, except that they bend them backward like the four-footed animals, as was said previously.[69] They have no front feet or hands, but wings—a part special to them in comparison to the other animals. Further, their haunch is long, like a thigh, and attached as far as the middle of the abdomen, so that when divided off it seems to **$504^{a}1$** be a thigh, although the thigh, which is intermediate between it and the shank, is a distinct part. Among the birds, the crook-taloned ones have the largest thighs and the strongest chest than the others.

All the birds have numerous nails; further, all are in a way multi-split-footed; for in most the toes are divided, while the swimmers, though web-footed, have their toes articulated and separated. Those that fly high in the air all have four toes; for most

69. $498^{a}27$–30.

have three in the front and one situated behind in place of a heel; but a few have two in front and two behind—for example, the so-called wryneck.[70] It is slightly larger than the chaffinch, and variegated in appearance. Special to it are the features having to do with its toes and with its tongue, which is like that of the snake; for it can extend it for a length of four finger-widths and then draw it back into itself again. Further, it can turn its head backward while keeping the rest of its body unmoved, like the snake. It has large nails, though in nature they are like those of the green woodpecker.[71] Its voice is a shrill cry.

Birds have a mouth, but it is a special one; for they have neither lips nor teeth, but a beak, and neither ears nor noses, but the ducts of these perceptual modalities: those for the nostrils in the beak, and those for hearing in the head. All of them have two eyes like the other animals, without lashes. The heavy birds[72] close their eyes with the lower eyelid, and all birds blink with a skin coming from the inner corner, while birds of the owl kind close their eyes with the upper eyelid too. The hard-scaled animals also do this same thing—for example, the lizards and the other animals of the same kind as these; for they all close their eyes with the lower eyelid, but they do not blink like the birds.

Further, birds have neither hard-scales nor hair, but feathers; and all the feathers have quills. They have no tail, but a rump;[73] the long-legged and web-footed ones have a short one, the contrary sorts a long one. The latter fly with their feet held close to the abdomen, while the small-rumped ones fly with their legs stretched out.

All of them have a tongue, but this is not [always] the same; for some have a long
504b1 tongue, others a short [broad] one. Most of all the animals, after the human being, certain kinds of birds emit articulate sounds: the broad-tongued birds are especially of this sort.[74]

No egg-laying animal has an epiglottis over the windpipe, but they contract and open the duct so that nothing heavy goes down into the lung.

Some kinds of birds also have spurs; but none is both crook-taloned and spurred. The crook-taloned ones are included among the flyers; the spurred ones, among the ones with a burdensome flight.

Further, some birds have a crest; in some it consists of erect feathers, but in the chicken alone it is special: for it is neither flesh nor far from flesh in nature.

2.13
The Fishes

Among the aquatic animals, the fish kind constitutes one group marked off from the others, encompassing many forms.

70. *PA* 695a23–26.
71. Reading κολιῶν.
72. *GA* 749b10–25.
73. *PA* 697b11–13.
74. 597b25–29.

They have a head, back, and underneath parts, in which place are the abdomen and the viscera. Behind they have a tail that is continuous [with their bodies], and not separate, but not the same in all of them. No fish has a neck, or any limb, or any testicles at all, either internal or external, or any breasts. In general, the non-live-bearing animals are no different in this latter respect, nor are all the live-bearing ones, but only the ones that are internally live-bearing from the outset and not first egg-laying. For in fact the dolphin is live-bearing, which is why it has two breasts, not high up, but near the sexual parts. It does not have visible nipples like the four-footed animals, but, as it were, two flow-holes, one on each flank, from which the milk flows, and the offspring get suckled by following alongside, as has been clearly seen by some people.

The fishes, then, as was said, have neither breasts nor any visible external duct belonging to sex organs. But special to them is the possession of gills, with which they emit water taken in through the mouth, and fins, of which most have four, though the elongated ones (for example, the eel) have two, situated near the gills. It is the same way with the mullets (for example, those in the lake at Siphae) have two, and the so-called tape fish[75] are the same way. But some of the elongated fishes have no fins at all (for example, the muraena), nor are their gills articulated like those of the other fishes.

Among the ones having gills, some have covers for the gills, though all of the selachians have no covers. All of those having covers have the gills at the sides, though among the selachians, the broad ones have the gills down below on the underneath parts (for example, the torpedo fish and the ray), while the elongated ones have them on the sides (for example, all the shark-like fishes). The fishing frog has them on the side, but not with spinous covers like the non-selachian-like ones, but with a skin-like one.

Further, among the ones having gills, those of some are simple, those of others double; but the last one by the body is simple in all of them. Again, some have few gills, others have numerous ones; but all have an equal number on both sides. Those that have the least number have one gill on each side, but a double one—for example, the cuckoo fish.[76] Others have two on either side, one simple and one double—for example, the conger and the parrot wrasse. Others have four simple ones on either side—for example, the *elops*, the *sunagris*, the muraena, and the eel. Others have four, but in two rows, except for the last—for example, the rainbow wrasse, the perch, the sheatfish, and the carp. All the shark-like fishes have double ones, five on each side; the swordfish eight double ones. As regards the number of gills in the fishes, then, it is this way.

Further, in relation to the other animals, the fishes are distinguished by a difference other than the possession of gills; for they neither have hair like the live-bearing terrestrial animals, nor hard-scales like some of the egg-laying four-footed ones, nor

75. Identity unclear.
76. $535^{b}18$.

feathers like the bird kind. Instead, most of them are soft-scaled, though a few are rough-skinned, and a very few smooth-skinned. Among the selachians, some are rough-skinned, others smooth-skinned: the conger, the eel, and the tuna are among the smooth-skinned ones.

All the fishes are sawtoothed except the parrot wrasse; and all have many rows of sharp teeth, in some cases on the tongue. They have a tongue that is hard and prickly, and attached in such a way that they sometimes seem not to have one. As for the mouth, some have one that opens wide, like certain live-bearing[77] four-footed animals, [others a tapering one].[78]

Among the organs of perception other [than the eyes], they have none that is apparent, either itself or the ducts, either of hearing or of smelling; but they all have eyes, without eyelashes, and their eyes are not hard.

505b1 The entire fish kind is blooded. Some of them are egg-laying, some live-bearing: all the soft-scaled ones are egg-laying; all the selachians are live-bearing, except the fishing frog.

2.14
The Snakes

Among the blooded animals, the snake kind remains. It is common to both [elements]: most of them are terrestrial, but a few, the aquatic ones, spend their lives in fresh water. There are also sea snakes,[79] much the same in shape as the terrestrial ones, in all respects except that the head they have is more like the conger's. There are many kinds of sea snakes, and they have a color that varies greatly. These do not live in very deep waters. The snakes are footless like the fish kind.

There are also sea millipedes,[80] much the same in appearance as the terrestrial ones, but slightly smaller in size. These live in rocky places. They have a redder color, more feet, and thinner legs than the terrestrial ones. And they, like the snakes, do not live in very deep waters.

Among small rock fishes there is one they call the "ship-detainer":[81] some use it [to bring luck] in lawsuits and as a love charm. It is inedible. Some people say that it has feet: it does not, but appears to do so because its fins are like feet.

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As for the external parts of the blooded animals, then, it has now been stated how many they are, of what sorts, and what differences they exhibit in relation to each other.

77. Perhaps "egg-laying" should be read.
78. Supplied from *PA* 697a1 to fill an apparent lacuna in the text.
79. 621a2–6.
80. 621a7–12.
81. Thought to attach itself to ships, impeding their progress.

2.15
The Internal Parts of the Blooded Animals

As for how the internal parts are, this must be stated in the case of the blooded animals first; for it is in this that the chief kinds differ from the rest of the other animals, by some being blooded and others bloodless. Blooded are the human being and the live-bearing four-footed animals; further, the egg-laying four-footed animals, the bird, the fish, the cetacean, and any other that is nameless because there is no kind, but rather a simple form applying to the particular cases—for example, the snake and the crocodile.

All the live-bearing four-footed animals, then, have a gullet and a windpipe that are situated in the same way as in human beings. It is likewise too in the egg-laying four-footed animals and in the birds. But they differ in the forms of these parts. Generally speaking, all those that take in air by inhaling and exhaling have a lung, a windpipe, and a gullet, and the position of the gullet and of the windpipe is always the same, though the parts are not the same, and the lung is neither the same nor does it have the same position.

Further, all the blooded animals have a heart and a diaphragm (the so-called mid-riffs). But in small animals, because of the smallness and fineness of the parts, this is not equally apparent, except in the case of the heart. There is something special in the case of the cows; for there is a kind of cow that has, though not in all cases, a bone in the heart. The heart of the horses also has a bone.

Not all of them have a lung—for example, the fishes do not, nor do any of the other animals that have gills. But all the blooded animals also have a liver, and most of the blooded ones also have a spleen. Most of the animals that are not live-bearing but egg-laying have a spleen so small that it almost escapes perception, as in most of the birds—for example, the pigeon, the kite, the hawk, and the owl. The *aigokephalos*[82] has no spleen at all. In the case of the egg-laying four-footed animals it is the same way; for these too have an altogether small spleen—for example, the turtle, the freshwater turtle, the toad, the lizard, the crocodile, and the frog.

Among the animals, some have a gallbladder near the liver, and some do not. Among the live-bearing four-legged ones, the deer does not have one nor does the roe deer—or, further, the horse, the mule, the ass, the seal, and some of the pigs. Among the deer, the so-called *achainês*[83] seem to have a gallbladder in their tail; but while what is so-called is certainly like a gallbladder in color, it is not on the whole so liquid, although its inside parts are like those of the spleen.

All deer have larvae[84] living in their heads; they are born in the hollow region under the root of the tongue and near the vertebrae to which the head is attached; in

82. Perhaps a sort of owl.
83. Perhaps a name for a second-year stag. Also at $611^{b}18$.
84. Those of a gadfly, *Oestrus rufibarbis*.

size they are no smaller than the largest maggots. They are born clinging together in masses, and their number is most often around twenty.

Deer, then, do not have a gallbladder, as was said,[85] but their intestine is so bitter that not even dogs are willing to eat it, unless the deer is very fat. The elephant too has a liver without a gallbladder, but when the animal is cut open in the place where the gallbladder naturally grows in those that have it, a gall-like liquid flows out in larger or smaller quantities.

Among the animals that take in seawater and have a lung, the dolphin does not have a gallbladder. The birds and the fishes all have one, as do the egg-laying four-footed animals, generally speaking, to either a greater or lesser extent. Some fishes, however, have it near the liver—for example, the shark-like fishes, the sheatfish, the angelfish, the ray, the torpedo fish, and (among the long fishes) the eel, the pipefish, and the hammerhead shark. The *kalliônumos*[86] also has it near the liver, and, among the fishes, it has the largest one for its size. Others have it beside the intestines, attached to the liver by certain very thin ducts. The bonito has the gallbladder extended along the intestine and of equal length, and often has a double fold. Others have it near the intestines, some further off, others closer to it—for example, the fishing frog, the *elops*, the *sunagris*, the muraena, and the swordfish.

Often too the same kind appears to have the gallbladder in either place—for example, some congers have it near the liver, others have it below and detached from the liver. It is likewise in the case of the birds; for some have the gallbladder near the stomach, others near the intestines—for example, the pigeon, the raven, the quail, the swallow, and the sparrow. But some have it at the same time near the liver and near the stomach—for example, the *aigokephalos*; others have it at the same time near the liver and near the intestines—for example, the hawk and the kite.

2.16
The Kidneys and the Bladder

All the live-bearing four-footed animals have kidneys and a bladder. Among the egg-laying [non-four-footed ones], none has them (for example, neither the bird nor the fish does), and among those that are four-footed, the sea turtle alone has these parts proportional in size to the other parts. The sea turtle has kidneys like those of the cows; that of the cow is, as it were, one kidney composed of many small ones. The bison too has all its internal parts like those of the cow.

85. 506[a]22.
86. Perhaps *Uranoscopus scaber*.

2.17
The Position of the Heart

The position of these parts in all the animals that have them is similar: the heart is in the middle, except in the human being; in it, it is more on the left, as was said **507^{a}1** previously.[87] Among all animals, the heart has its point turned toward the front; except in the case of the fishes, in which it may not appear to be so; for they do not have the point directed toward the chest, but toward the head and the mouth. And the point of their heart is attached [to a duct] where the right and left gills meet each 5 other. There are also other ducts extending from the heart to each of the gills, larger in the larger fishes, smaller in the smaller ones. But the one at the point of the heart of the large ones is a very thick white pipe.

A few fishes have a gullet (for example, the conger and the eel), but a small one. 10

Among the animals that have a liver, in those that have an undivided one it is situated wholly on the right side; in those in which it is divided from its starting-point, the larger part is on the right side. For in some fishes the parts are detached from each other and are not attached at the starting-point—for example, among the fishes, the shark-like fishes. And there is also a kind of hare around Lake Bolbe, in so-called 15 Figland, as well as in other places, that might seem to have two livers because of the distance between the connecting ducts, as is the case with the lung of birds.

In all animals, the spleen, when in accord with nature, is on the left side, and the kidneys, in those animals that have them, are situated in the same way. Cases have 20 been observed in some of the four-footed animals, when they were opened up, of having the spleen on the right side and the liver on the right; but these are judged to be monstrosities.

In all animals the windpipe extends to the lung (in a way we will describe later[88]), and the gullet extends to the stomach through the diaphragm, in those that have 25 a gullet; for most of the fishes, as was said previously,[89] do not have one, and the stomach is directly connected to the mouth. That is why in some large fishes, when they are pursuing smaller ones, the stomach[90] falls forward into the mouth.

All the animals mentioned have a stomach, and one similarly situated (for it is 30 situated directly under the diaphragm), with an intestine connecting to it and ending at the outlet for the nourishment that is called the "rectum." But they have stomachs that are dissimilar. For, first, among the live-bearing four-footed animals, the ones that are horned but do not have two rows of teeth have four places[91] of this sort: 35 these, of course, are the ones said to chew the cud.[92] For their gullet, starting from

87. 496^{a}16.
88. E.g., *PA* 665^{a}19–21.
89. 507^{a}10.
90. Actually the air bladder; also 591^{b}6.
91. Reading τόπους as at 507^{a}36.
92. The ruminants.

the mouth, extends downward near the lung, from the diaphragm as far as the large
507ᵇ1 stomach. It is rough on the inside and divided. Attached to it near the entrance of the gullet is what, from its appearance, is called the "net"; for outside it is like the
5 stomach, but inside it is like a net. The net is much smaller in size than the [large] stomach. Connected to it is the vase, rough on the inside and laminated, which is much the same as the net in size. After that is what is called the "reed," larger than
10 the vase in size and more elongated in shape; on the inside it has many smooth folds. Directly after this is the intestine.

The horned animals that do not have two rows of teeth have a stomach of this sort, though they differ from each other in the shapes and sizes of the parts, and also in that the gullet in some extends to the stomach in the middle, in others on the
15 side. The animals that have two rows of teeth have one stomach—for example, the human being, the pig, the dog, the bear, the lion, and the wolf. The *thôs*[93] too has all its internal parts like in the wolf.

All these, then, have one stomach, and coming after it an intestine. But some have a comparatively large stomach, like the pig and the bear (and that of the pig has a
20 small number of smooth folds); some have a much smaller one, not much larger than the intestine, like the lion, the dog, and the human being. And, as for the others, the forms vary along the lines of the stomachs of those mentioned; for some have one like that of the pigs, others like that of the dogs, and likewise the bigger and the smaller
25 animals. The difference in these is with respect to the sizes, shapes, and thickness or thinness of the stomach, and also with respect to the position of the point of connection of the gullet.

The nature of the intestines also differs in each of the two groups of animals that were mentioned (those that do not have two rows of teeth and those that do have two
30 rows of teeth) in size, in thickness, and in folding.

The intestines of animals that do not have two rows of teeth are all larger; for all these animals themselves are larger; for few of them are small, and no horned animal is altogether small. Some animals have appendages to the intestines, but no animal that does not have two rows of teeth has a straight intestine.

The elephant has an intestine with appendages, so that it appears to have four
35 stomachs. In this too the nourishment appears, and it has no receptacle for it apart from this. The viscera it has are much the same as those of the pigs, except that the
508ª1 liver is four times as large as that of the cow, and so are the other viscera, though the spleen, in proportion [to the size of the animal], is smaller.

The nature of the stomach and the intestines in the egg-laying four-footed animals
5 is the same way—for example, the land turtle and the sea turtle, the lizard, both sorts of crocodiles,[94] and, in general, all animals of this sort; for they have one simple stomach, in some cases like that of the pig, in others like that of the dog.

93. Perhaps the stoat or civet (also 580ª25, *GA* 742ª9, 744ᵇ16).
94. I.e., water and land (actually a large lizard).

The snake kind is similar and in pretty much all respects has parts that are much the same as, among the egg-laying footed animals, the lizards—if one imagined these to be elongated and deprived of feet. For it is hard-scaled and has back and underneath parts that are much the same as those of the lizard—except that it does not have testicles, but instead, like the fishes, has two ducts that converge into one, and a womb that is long and divided in two. The rest of its internal parts are the same as those of the lizards, except that, because of its narrowness and length, all the viscera are narrow and long, so that they are apt to escape notice due to the similarity of the shapes. They have a very long windpipe and their gullet is longer still. The starting-point of the windpipe is so close to the mouth itself that the tongue seems to be underneath the windpipe; and the windpipe seems to project over the tongue because the tongue is contracted and does not stay in place as in the other animals. The tongue is thin, long, and black, and comes out a long way. A special affection of the tongue of the snakes and the lizards in comparison to those of the other animals is that the tip is divided in two, especially the tongue of the snakes; for the tips of theirs are as thin as hairs. The seal also has a divided tongue.

The snake has a stomach that is like a spacious intestine, similar to that of the dog. Next is the intestine, which is long, thin, and a single one to the end. The heart is next to the larynx, and is small and kidney-like; that is why it may sometimes seem not to have its point directed toward the chest. Next is the lung, which is simple, articulated by a fibrous duct, very long, and well separated from the heart. The liver is long and simple, the spleen is small and round, as in the lizards. It has a gallbladder like that of the fishes; for the water snakes have it near the liver, while the others for the most part have it near the intestines. All are sawtoothed. They have ribs equal in number to the days of the month; for they have thirty.

Some people say that precisely the same thing occurs with the snakes as also occurs with swallow chicks; for if one pricks out the eyes of snakes, they say that they grow again. Also, the cut-off tails of lizards and snakes grow back.

The intestines and the stomach of the fishes are the same way; for they have one simple stomach, though differing in shapes. For some of them have an altogether intestine-like stomach—for example, the one they call the "parrot wrasse," which also seems to be the only fish to chew the cud. And the whole length of the intestine is simple, and if it has a convolution, it gets unloosed into one.[95]

A special affection of the fishes and of most of the birds is to have appendages [to the intestines], but the birds have them low down and few in number, while the fishes have them high up near the stomach, and some have many of them—for example, the goby, the burbot,[96] the perch, the *skorpios*,[97] the *kitharos*,[98] the red mullet, and the sea bream. The mullet has many on one side of the stomach and

95. $509^{a}16–17$.
96. Reading γαλῆ.
97. A species of *Scorpaena*.
98. Perhaps the sole or the turbot.

one on the other side. Some have only a few of them—for example, the *hêpatos* and the *glaukos*. The gilthead also has only a few. These fishes also differ from each other—for example, one gilthead will have more, another fewer. There are some fishes that have none at all—for example, most of the selachians. Among the others, some have few, others a great many. But all the fishes have the appendages near the stomach.

The birds exhibit a difference in their internal parts both in relation to each other and in relation to the other animals. For some have a crop in front of the stomach—for example, the chicken, the wood pigeon, the pigeon, and the partridge. The crop is a large hollow skin into which the nourishment in its first state enters and is unconcocted. At the point where it leaves the gullet it is very narrow, then it is broader, and where it reaches the stomach it is thinner again. Most birds have a stomach that is fleshy and firm, and inside it is a strong skin that can be pulled away from the fleshy part. Other birds do not have a crop, but in place of it a gullet that is broad and large, either throughout the whole of it, or where it extends to the stomach—for example, the jackdaw, the raven, and the crow. The quail also has a gullet that is large below, and the *aigokephalos* has one that is a little wider below, as does the little owl. The duck, the goose, the gull, the *katarraktês*, and the great bustard have a gullet that is broad and large throughout, and many of the other birds likewise. Some have a part of the stomach that is like a crop—for example, the kestrel. There are some that have neither a crop nor a wide gullet but a long stomach; these are the small birds—for example, the swallow and the sparrow. A few have neither a crop nor a wide gullet, but rather a very long one; these are the ones that have a long neck—for example, the *porphuriôn*; and pretty much all these birds emit a wetter residue than the other birds. The quail has these parts in a special way in comparison to the other birds; for it has a crop and, in front of the stomach, a gullet that is wide and large. The crop is a long way distant, in proportion to the bird's size, from the gullet where this is in front of the stomach.

Most have an intestine that is thin and simple when uncoiled. The birds have appendages, as was said,[99] that are few in number, and these are not high up, as in the fishes, but low down near the end of the intestine. Not all have them, but most do—for example, the chicken, the partridge, the duck, the night raven, the *lokalos*, the *askalaphos*,[100] the goose, the swan, the great bustard, and the owl. Some of the small birds also have them, but altogether small ones—for example, the sparrow.

99. 508^b15.

100. Perhaps an owl of some sort.

BOOK 3

3.1
The Parts Involved in Generation

The other internal parts—how many they are, their qualities, and the differences they exhibit in relation to each other—have now been spoken about. It remains to speak about the parts that contribute to generation. For though in all females these are internal, those of the males exhibit many differences.

Among the blooded animals, some have no testicles at all; some have them, but have them internally (and among those having them internally, some have them near the loin, beside the place of the kidneys, others have them near the abdomen); and some have them externally. And the sex organ of these is in some animals closely attached to the abdomen, in others it is loose, as too are the testicles. It is closely attached to the abdomen in one way in the animals that urinate forward and those that urinate backward.

Among the fishes, none has testicles, nor does any other animal that has gills, nor any of the whole snake kind, nor, in general, any footless animal that is not internally live-bearing. Birds have them, but have them internally close to the loin. And among the egg-laying four-footed animals it is the same way—for example, the lizard, the turtle, and the crocodile, and, among the live-bearing ones, the hedgehog. Among those that have them internally, some have them close to the abdomen—for example, among the footless ones, the dolphin, and, among the live-bearing four-footed animals, the elephant. Others have them plainly visible.

The attachment of the testicles to the stomach and the place continuous with it and what sort of difference it exhibits was spoken about previously;[101] for in some they are continuous from the rear and are not detached—for example, in the pig kind, while in others they are detached—for example, in the human beings.

The fishes do not have testicles, as was said previously,[102] nor do the snakes. They have two ducts connected to the diaphragm on either side of the spinal column, converging into a single duct above the outlet for the residue. By "above" we mean toward the spinal column. In the mating season, these ducts become full of seminal fluid, and when they are squeezed, the seed, which is white, emerges. But one must observe with the help of the *Dissections* the differences these parts exhibit in relation to each other; these will be stated more exactly later on in the discussions concerning what things are special to each of these.

The [males of the] egg-laying animals, whether two-footed or four-footed, all have testicles that are near the loin underneath the diaphragm, some more white, others more yellow, and they are altogether encompassed by very thin small blood vessels.

101. $500^{a}33–^{b}15$.
102. $508^{a}12–14$.

From each a duct extends, and the two converge into one, just as in the fishes, above the outlet for the residue. This is the sex organ. In the small ones it is not clear to perception, but in the larger ones (for example, the goose and animals of such size) it becomes more evident when mating has recently occurred.

The ducts both in the fishes and in these animals[103] are attached to the loin under the stomach and the intestines, between these and the great blood vessel, from which ducts extend to both of the testicles. As in the fishes, in mating season the seminal fluid appears in the ducts and the ducts become very clear to perception, but when the season is over, the ducts are sometimes invisible, as is also the case with the testicles of the birds. Before mating, birds have testicles that are in some cases small, in others altogether invisible; but when they are mating, they have very large testicles. This occurs in a way that is most noticeable in the wood pigeons and the partridges, so that some people think that in winter these birds have no testicles at all.

Among the animals that have the testicles in the front, some have them internally near the abdomen, like the dolphin. Others have them externally, in plain view, near the end of the abdomen. In the case of these animals, though in other respects they are the same way, they differ in that some have the testicles by themselves, while others (the ones that have them externally) have them in what is called the "scrotum."

In all the live-bearing footed animals, the testicles themselves are the following way. From the aorta blood vessel–like ducts extend to the head of each testicle, and two others from the kidneys. The latter are bloodlike, those from the aorta bloodless. From the head of the testicles, along the testicle itself, there is a duct denser and more sinewy than the others that bends back again in each of the testicles toward its head; and again from the head of each the ducts extend until they join together in the front, at the sex organ. The ducts that bend back and those that lie along the testicles are surrounded by the same membrane, so that it seems to be one duct, unless one cuts open the membrane. In the duct that lies along the testicles the liquid is still bloodlike, though less so than the higher-up ones coming from the aorta; in the ducts that bend back toward the tube in the sex organ the liquid is white. A duct also leads away from the bladder and joins together with the upper part of the tube; and around this is a sort of sheath called the "sex organ."

One may observe the things that were mentioned in the following diagram [Fig. 1]:

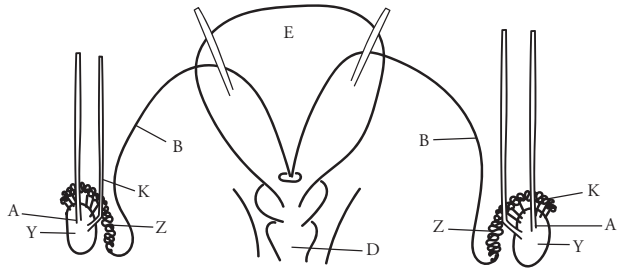

Fig. 1

103. The egg-laying four-footed ones.

A is the starting-point of the ducts from the aorta. KK are the heads of testicles and the ducts that come down into them. ZZ are the ducts extending from the previous ones to the testicles. BB are the ducts that turn back, in which the white liquid is present. D is the sex organ, E the bladder, and YY the testicles.

When the testicles themselves are severed and removed, the ducts are drawn up. People destroy the testicles of animals by rubbing when they are still young, or by **510^{b}1** cutting them out later on. But a case has been known of a bull being castrated and immediately afterward mating and begetting an offspring.

These, then, are the ways the testicles are in the animals.

The uterus in the animals that have a uterus is neither the same way nor is it the same in all; instead, it differs both among the live-bearing animals in relation to each other and among the egg-laying ones. It is divided in two in all those that have the uterus near the sexual parts, and one of its branches is toward the right, the other toward the left. But its starting-point is a single one and its mouth a single one; it is like a very fleshy and cartilaginous tube in most of the largest animals. One of these parts is called the *hustera* and *delphus* (from which the word *adelphos*[104] derives), the other part, the tube or mouth of the uterus is called the *mêtra*. In all the live-bearing two-footed and four-footed animals, the uterus is below the diaphragm—for example, the human being, the dog, the pig, the horse, and the cow. It is the same way in all the horned animals. At the extremities of its so-called horns, the uterus of most animals has a coil.

In the case of those animals that are externally egg-laying, the uterus is not similarly situated in all; instead, that of the birds is near the diaphragm, that of the fishes down below, just as in the live-bearing two-footed and four-footed animals, except that it is thin, membranous, and long, so that in very small fishes, each of the two parts of the uterus seems to be one egg. On the supposition that these sorts of fishes have only two eggs, they are the ones whose eggs are said to be crumbly; but, in fact, each of the parts has not one egg but many; that is why it breaks into many pieces.

The uterus of the birds has a tube below that is fleshy and firm, and a part near the diaphragm that is membranous and so altogether thin that the eggs might seem to be outside the uterus. In the larger birds the membrane is more clearly visible, and if inflated through the tube it rises and swells out. In the small birds all these parts are less visible.

The uterus is also the same way in the egg-laying four-footed animals—for example, the turtle, the lizard, the frog, and the others of this sort; for the tube below is a single one and fleshy, and the divided part and the eggs are up at the top near the **511^{a}1** diaphragm. In those footless animals that are externally live-bearing though internally egg-laying—for example, the sharks and the other so-called selachians (for an animal that is footless, has gills, and is live-bearing is called a "selachian")—the uterus is divided in two, and likewise extends to the diaphragm, as in the birds. Further,

104. "Brother."

through the middle of the two branches, starting from down below, it extends until it reaches the diaphragm, and the eggs are produced here and above at the starting-point of the diaphragm. Then they advance into the wider space, and animals come to be from the eggs. But the differences in the uterus of these fishes in relation to each other and also in relation to the other fishes may be more exactly observed with the help of the diagrams in the *Dissections*.

The snake kind also exhibits difference both in relation to these animals and in its members, relations to each other. For, though all the other kinds of snakes are egg-laying, the viper alone is live-bearing, though it is internally egg-laying first; that is why its uterus is much the same as that of the selachians. The uterus of the snakes is long, as is their body, and starting below from a single duct it extends continuously on either side of the spinal column—as if there were a single duct on each side—until it reaches the diaphragm; there the eggs appear in a column; and they are laid not one by one but in a continuous strand.[105]

All the animals that are live-bearing both internally and externally have the uterus above the stomach; those that are egg-laying all have it below, near the loin. All the ones that are externally live-bearing but internally egg-laying play a double game; for the lower part of the uterus, in which the eggs are, is near the loin, while the part around the outlet is above the intestines.

There is a further difference exhibited by one uterus in relation to another. For the horned animals that do not have two rows of teeth have cotyledons in the uterus when it contains the fetus, and so have the ones that do have two rows of teeth—for example, the hare, the mouse, and the bat. The other live-bearing footed animals with two rows of teeth all have a smooth uterus, and the attachment of the fetus is to the uterus itself and not to a cotyledon.

The non-uniform parts are in the animals in these ways, then, both the external ones and the internal ones.

3.2
The Blood Vessels (1)

511[b]1 Among the uniform parts, the most common one in all the blooded animals is the blood and the part in which it naturally appears (this is called a "blood vessel"); next come the analogs of these, serum and fibers, and that which most constitutes the body of animals, flesh and the analog of this in each part; further, bone and the analog of this—for example, spine and cartilage; further, skin, membrane, sinew, hair, nails, and the ones that correspond to these; and in addition, fat, suet, and the residues (excrement, phlegm, and yellow and black bile).

105. 558[b]1–2.

But since the nature of blood and that of the blood vessels seems to be a starting-point, these must be spoken about first—all the more as some of those who spoke about them previously did not speak about them correctly. The cause of ignorance is the difficulty of their being observed. For in dead animals the nature of the blood vessels with the most control is invisible, principally because they collapse immediately when the blood leaves them (for the blood pours out all at once like liquid from a vessel; for there is no blood that is by itself, except for a little in the heart—all of it is in the blood vessels). In the living animals it is impossible to observe how these parts are; for their nature is internal. As a result, those who have made their observations on dead and cut-open animals have not observed the most important starting-points, while those who have made them on very thin human beings[106] have based their determinations about the starting-points of the blood vessels on what was then apparent externally.

Syennesis, the doctor from Cyprus, speaks in this way: "The nature of the thick blood vessels is this: from the navel along the loin, across the back, along the lung, under the breasts; one from right to left, the other from left to right; the one from the left through the liver to the kidney and the testicles; the one from the right, to the spleen, kidney, and testicles, and from there to the sex organ."

Diogenes of Apollonia says this: "The blood vessels in the human being are as follows: There are two large ones; these extend through the stomach along the spinal column, one to the right, the other to the left, each to the leg on its own side [of the body], and upward to the head, along the clavicles through the throat. From these, blood vessels extend to the whole body, from the one on the right to the right side, **512^{a}1** from the one on the left to the left side; the two largest ones go to the heart near the spinal column, while others, a little higher up, go through the chest under the armpits, each to the hand on its own side; one of the these is called the 'splenetic,' the other the 'hepatic.' Each of them divides in two at its extremity, one part going to the thumb, the other to the palm of the hand; from these a number of thin blood vessels with many branches go to fingers and the rest of the hand. Other yet thinner ones extend from the primary blood vessels, from that on the right to the liver and from that on the left to the spleen and the kidneys. The ones that extend to the legs divide in two at the point of attachment [of the legs and the trunk], and extend through the entire thigh. The largest of them[107] goes down the back of the thigh, and shows its thickness; the other is on the inside of the thigh, and is slightly less thick than the first. Then they extend along the knee to the shank and the foot. And like those that go to the hands, they reach to the sole of the foot, and from there they extend to the toes. From these large ones many thin blood vessels divide off toward the stomach and the rib.

106. In whom the blood vessels (the veins and arteries) were easier to see.
107. The femoral artery.

"The blood vessels that extend to the head through the throat[108] are evident as large ones in the neck. From each of these two, at the point where it ends, many blood vessels divide off to the head, some from the right toward the left, some from the left toward the right; each of the two ends beside the ear. There is another blood vessel in the neck on either side of the large one, a little smaller than it, to which most of the blood vessels from the head are connected. These extend through the throat on the inside, and from each of these blood vessels extend below the shoulder blades to the hands; and other blood vessels, slightly smaller in size, are evident along the splenetic and hepatic vessels; these are the ones that are opened when any pain is felt under the skin, while if any is felt in the region of the stomach, it is the hepatic and the splenetic ones. From these, other blood vessels extend below the breasts.

512b1 "Others—thin ones—extend on each side through the spinal marrow to the testicles. Others extend under the skin and through the flesh to the kidneys; these terminate at the testicles in men and, in women, at the uterus. The blood vessels coming from the stomach are at first broader, then become thinner, until they change from right to left and from left to right. They are called the 'spermatic' ones.

"The coarsest-grained blood is absorbed[109] by the fleshy parts; but when it runs over into the places mentioned, it becomes thin, hot, and foamy."

3.3
The Blood Vessels (2)

Syennesis, then, and Diogenes spoke in this way, Polybus in the following one: "There are four pairs of blood vessels. One comes from the back of the head through the neck on the outside along both sides of the spinal column until it reaches the haunches and the legs, then it goes through the shanks to the outer parts of the ankles[110] and the feet. And that is why, for pains in the back and the loin, blood-letting incisions are made in the hams and the outer parts of the ankles.

"Other blood vessels go from the head, along the ears, through the neck. These are the so-called jugulars; each of them goes along the spinal column on the inside, along the loin muscles, to the testicles and the thighs, through the inner parts of the hams, through the shanks to the inside of the ankles and the feet. And that is why, for pains in the loin muscles and the testicles, blood-letting incisions are made in the hams and the inside of the ankles.

"The third pair, going from the temples through the neck under the shoulder blades, reaches the lung. The ones from the right to the left go under the breast to the

108. The jugular veins.
109. Reading ἐκπίνεται.
110. Reading εἰς τῶν σφυρῶν τὸ ἔξω.

spleen and kidney; those from left to right go from the lung under the breast to the[111] liver and the kidney: both end in the anus.

"The fourth pair goes from the front of the head and the eyes underneath the neck and clavicles; from there they extend through the upper part of the arms to the elbows, then through the forearms to the wrists and the joints of the fingers, through the lower part of the upper arms to the armpits, above the ribs, until one of them reaches the spleen and the other the liver; then, passing over the stomach, they both end up in the sex organ."

This, then, is pretty much what others have said. There are also some writers about nature who have not busied themselves with giving such an exact account of the blood vessels, but who all alike put the starting-point of these in the head, that is, in the brain—which is not correct. But since observation is difficult, as was said previously, if one cares about these sorts of things, it is only in animals emaciated beforehand and then strangled that it is possible to learn adequately about them.

This is the way the nature of the blood vessels is. There are two blood vessels in the thorax, along the spinal column on the inside; of these, the larger one is situated in front, the smaller one behind it; the larger is more toward the right side of the body, the smaller toward the left, and called the "aorta" by some people, from the fact that even in dead bodies its sinewy part is observed.[112] These blood vessels have their starting-point in the heart; for they go through the other viscera, in whichever direction they happen to extend, wholly preserving themselves as blood vessels in passing through these, while the heart is, as it were, a part of them, and more so of the front larger one, because these are above and below, while the heart is in the middle of them.

All hearts have cavities in them, but in those of the very small animals the largest is scarcely visible; in the middle-sized ones, the second also is; but in the largest ones the three are visible. The heart has its pointy end turned toward the front, as was said previously;[113] the largest cavity is on the right side, and highest up; the smallest one is on the left; and the middle-sized one is in the middle of these two. Both of the latter are much smaller than the largest one. All three, however, are connected by ducts to the lung, but these are invisible because of the smallness of the ducts, except for one.[114]

The great blood vessel is attached to the largest cavity, the one that is uppermost and on the right side; then it goes through the middle cavity and extends out as a blood vessel again, as if the cavity were a part of the blood vessel in which the blood forms a lake. The aorta is attached to the middle cavity; except not in this way, but is connected to it by a much narrower passage. And though the great blood vessel goes through the heart, [the passage] that leads to the aorta extends from the heart. The great blood vessel is membranous and skin-like, while the aorta is narrower than

111. Reading εἰς τὸ.
112. An *aortêr* is also a "means of support," as the sinewy aorta might be taken to be.
113. 496^{a}10.
114. Perhaps the pulmonary artery.

it, and very sinewy; as it extends further toward the head and the lower parts of the body, it becomes altogether narrow and sinewy.

First, then, there is a part of the great blood vessel that extends from the heart toward the lung and the attachment of the aorta; this part is a large and undivided blood vessel. It is divided into two parts, one going toward the lung and one toward the spinal column and the last vertebra of the neck. The blood vessel that extends toward the lung, which is itself double, divides into two at first, then extends along each passage and each aperture, being larger along the larger ones, smaller along the smaller ones, in such a way that one cannot find any part at all where there is not both an aperture and a small blood vessel; for the end-points are invisible because of their extreme smallness, while in fact the entire lung appears full of blood. The ducts from the blood vessel are situated above the pipes that extend from the windpipe. And the blood vessel extending to the vertebra of the neck and the spinal column extends back again along the spinal column, as Homer says in his poem: "All that blood vessel he cut through that runs all the way up the back till it reaches the neck."[115] And from this blood vessel, small blood vessels extend along each rib to each vertebra, and at the vertebra above the kidneys the blood vessel divides into two.

These parts, then, divide off from the great blood vessel in these ways. But above these, from the part extending from the heart, the whole blood vessel, dividing again, goes to two places. For these go to the sides and the clavicles, then through the armpits to the arms in the human beings, to the front legs in the four-footed animals, to the wings in the birds, and to the pectoral fins in the fishes.

The starting-points of these blood vessels, where they first divide off, are the so-called jugulars, and where they divide off to the neck, they extend along the windpipe. (Sometimes, when these are pressed on the outside, people—without choking—fall down unconscious, their eyes closed.) Extending on in this way, keeping the windpipe between them, they go on to the ears, at the point where the jaws join the head. Then again from that point they divide off into four, one part[116] of which bends back and descends through the neck and the shoulder, and joins the former dividing off from the blood vessel at the bend of the arm, while the other part ends up in the hand and the fingers.

Each one of the other pair extends from the place around the ears to the brain, and divides up into many thin small blood vessels into what is called the "meninx," which surrounds the brain. The brain itself is bloodless in all animals and no blood vessel, whether small or large, ends in it. Among the rest of the blood vessels that divide off from this blood vessel, some encircle the head, others end in the perceptual organs and the teeth by means of altogether thin small blood vessels.

115. *Iliad* 13.546–547.

116. Consisting of a pair of blood vessels (probably the facial veins and the external jugular vein).

3.4
The Blood Vessels (3)

In the same way the parts of the lesser blood vessel, the so-called aorta, divide off, following along together with those of the great blood vessel, except that the ducts are smaller and the small blood vessels of it much fewer than those of the great blood vessel.

These, then, are the ways the blood vessels above the heart are.

The part of the great blood vessel that lies under the heart extends, unsupported, through the diaphragm, and is secured to the aorta and the spinal column by loose membranous ducts. From it one blood vessel, short but broad, extends through the liver, and from it many thin blood vessels extend into the liver and disappear. From the blood vessel that goes through the liver two branches divide off, of which one ends at the diaphragm (the so-called midriffs), while the other, returning back again through the armpit into the right arm, joins the other blood vessels at the inside **$514^{b}1$** of the bend; that is why when doctors open this blood vessel people get relief from certain hepatic pains. From its left side a small but thick blood vessel extends to the spleen, and the small blood vessels that come from it enter the spleen and disappear. Another part divides off from the left side of the great blood vessel and ascends in the same way to the left arm; except that the former is the one that goes through the liver, while this one is distinct from the one extending through the spleen.

Further, other blood vessels divide off from the great blood vessel, one to the omentum, one to the so-called pancreas; and from the latter many blood vessels extend through the mesentery. All these end in a single large blood vessel, which extends all along the intestine and the stomach as far as the esophagus. And from around these parts many blood vessels divide off.

The aorta and the great blood vessel, each of the two being one single thing, extend as far as the kidneys. There they become more attached to the spinal column, and each divides into two, like the letter lambda, and the great blood vessel situates itself more at the back of the aorta. The aorta, for its part, is most attached to the spinal column near the heart; and the attachment is by means of very small sinewy blood vessels.

The aorta, where it leads away from the heart, is a hollow of considerable size, but as it proceeds it is narrower and more sinewy. From the aorta blood vessels extend to the mesentery, just like those from the great blood vessel, except that they are much inferior in size; for they are narrow and fibrous; and in fact they end in thin and intricate fibrous small blood vessels. No blood vessel extends from the aorta to the liver or the spleen.

The divided-off vessels of each of these two blood vessels[117] extend to each haunch, and both attach themselves to the bone. Blood vessels also lead to the kidneys[118] from

117. The aorta and the great blood vessel.
118. Cf. $497^{a}4$–17.

both the great blood vessel and from the aorta, except that they do not go into the cavity, but lose themselves in the body of the kidneys. From the aorta two other ducts lead into the bladder that are strong and continuous; others also lead from the cavity of the kidneys that have no connection to the great blood vessel. At the middle of each kidney a hollow and sinewy blood vessel is attached that extends along the spinal column itself through the narrow regions; then each of the two first disappears into its own haunch, then become clear to perception again extending to the haunch. The limit points of these attach to the bladder and to the sex organ in males, and in females to the uterus. No blood vessel extends from the great blood vessel to the uterus, but from the aorta many densely clustered ones do so.

Other blood vessels also extend from the aorta and the great blood vessel at the point where they divide off. Some go first to the groin and are large and hollow, then, going through the legs, they end in the feet and the toes; others, in turn, go through the groin and the thighs crosswise, from left to right and from right to left, and join together with the other blood vessels in the hams.

The way the blood vessels are, then, and from where they take their starting-points is evident from these descriptions.

In all the blooded animals, this is the way things are as regards the starting-points and the great blood vessels (for the rest of the majority of the blood vessels are not this way in all these animals; for their parts are not this way either, nor do they all have the same ones), although this fact is not equally evident in all of them, but is most so in the ones that have abundant blood and are largest. For in the small ones that do not have abundant blood, either because of nature or because of the fatness of their bodies, it is not equally possible to acquire knowledge of it; for in some of them the ducts are indistinct, as some streams are when under a lot of mud, while others have a few fibers in place of blood vessels. But the great blood vessel is most clearly distinguishable in all of them, even the smallest.

3.5
The Sinews

The sinews are the following way in the animals. Their starting-point too[119] is the heart; for the heart itself has sinews within itself, in the largest cavity; and the so-called aorta is a sinewy blood vessel. Its end-points, indeed, are altogether sinewy; for they are not hollow, and their elasticity is of precisely the same sort as that of the sinews where they end up, at the bends of the bones. Nonetheless, the nature of the sinews is not continuous from a single starting-point in the way the blood vessels are. For the blood vessels, as in the drawn mannikins,[120] have the shape of the entire body, so

119. Like that of the blood vessels.
120. *GA* 743a2, 764b29–31.

that in very thin people their entire bulk appears to be full of small blood vessels (for **515^{b}1**
the thin small blood vessels occupy the same place in thin people as flesh does in fat
ones), while the sinews are dispersed around the joints and bends of the bones. If, on
the other hand, their nature were continuous, the continuity of all of them would be 5
evident in thin people.

The most important parts of the sinews have to do with the part of the body that controls jumping (this is called the "ham"); another sinew, a double one, is the tendon;[121] also, those for promoting strength, the *epitonos* and the shoulder-sinews.[122] There are also nameless sinews around the bend of the bones; for all the bones that 10
are composed attached to each other are bound together by sinews, and around all the bones there is a large number of sinews. Except that in the head there are none: the sutures of the bones themselves keep it together.

The nature of the sinew is to be splittable lengthwise, unsplittable crosswise, and to have a lot of elasticity. Around the sinews a mucus-like liquid occurs, which is 15
white and viscous, by which the sinews are nourished and from which they apparently come about. While blood vessels can be cauterized, a sinew when cauterized is entirely destroyed; and if a sinew is cut, it does not grow back together again. Numbness never occurs where in the body there is no sinew.[123] 20

Most of the sinews are around the feet, the hands, the ribs, the shoulder blades, the neck, and the arms.

All blooded animals have sinews; but in those that have no bends, but are footless and handless, the sinews are thin and invisible; that is why in the fishes they are most clear to perception near the fins. 25

3.6
The Fibers

The fibers are intermediate between sinew and blood vessel. Some of them contain a liquid, the serum, and they extend from the sinews to the blood vessels, and from those to the sinews.

There is also another kind of fibers, which occurs in blood, but not in the blood of 30
every animal. If they are removed from the blood, it does not solidify, but if they are not removed, it does solidify. While fibers are present in the blood of most animals, no fibers are present in that of the deer, the roe deer, the antelope,[124] and some others. That is why their blood does not solidify to the same degree as that of the 35
other animals. That of the deer solidifies to much the same degree as that of the hares **516^{a}1**
(in both of these the solidification is not firm, as in the other cases, but loose, like

121. Either the Achilles tendon or the great ligament of the neck.
122. Probably the deltoid muscle.
123. Aristotle did not distinguish nerves from sinews.
124. *PA* 663^{a}11.

that of milk if one does not put into it what makes it curdle[125]). That of the antelope solidifies more; for it gets composed to much the same degree as that of the sheep, or slightly less.

As regards blood vessel, sinew, and fiber, then, this is the ways they are.

3.7
The Bones

The bones in animals are all connected to a single one and are continuous with each other, like the blood vessels; there is no bone that is by itself.

The starting-point in all animals that have bones is the spinal column. The spinal column is composed of vertebrae and extends from the head down to the loins. The vertebrae are all perforated and at the top the bone of the head, which is called the "cranium," is continuous with the last vertebra. Of this the sawtoothed part is a suture. The cranium is not the same in all animals: some, like the dog, have a cranium consisting of a single bone; others, like the human being, have one that is composite: the female one has a circular suture; the male one has three sutures that joint together at the top and are triangular-shaped. But a man's head having no sutures has been observed.

The head is composed not of four bones but of six: two of these are near the ears, and are small compared to the rest. From the head extend the jaws, which are bones. All the other animals move the lower jaw; the river crocodile, alone among the animals, moves the upper jaw.[126]

In the jaws the tooth kind is present: the tooth is a bone, part unperforated, part perforated, and is the only bone that it is impossible to engrave.

From the spinal column, which is precisely the linchpin, the clavicles and the ribs extend. The chest, for its part, is situated on ribs; but these ribs meet together, while the others do not meet together; for no animal has bones around the stomach. Further, there are the bones in the shoulders, which are called the "shoulder blades," followed by the ones in the arms, and connecting to these the ones in the hands. In those animals that have front legs, they are the same way.

Below, where the spinal column reaches its limit, after the haunch bone, there is the hip socket, and now the leg bones, the ones in the thighs and in the shanks, which **516[b]1** are called "limb bones," of which the ankle is a part, and the so-called *plêktra*,[127] in those animals that have an ankle. Continuous with these are the bones in the feet.

In all the blooded and footed animals that are live-bearing the bones do not differ much, but rather by analogy only, in hardness and softness and in size. Further, in the same animal, some bones have marrow, others do not. Some animals would seem to have

125. E.g., fig juice (*Mete*. 384[a]21) or rennet.
126. Cf. 492[b]23–24.
127. Analogous, perhaps, to the spurs of birds (also *plêktra*). See 526[a]5.

no marrow at all in their bones (for example, the lion), because of having an altogether small quantity that is fine-grained and present in few bones; but it actually has it in the thigh bones and in the arms.[128] The lion has bones that are the most solid of all; for they are so hard that when they are rubbed together sparks fly out just like from stones.

The dolphin also has bones, not spine. And among the other blooded animals, some vary but little [from these] (for example, those of the birds), while those of others are the same by analogy (for example, those in the fishes). For among these, the live-bearing ones have cartilaginous spine (for example, the so-called selachians), while the egg-laying ones have spine that is like the spinal column in the four-footed animals. A special affection in the fishes is that in some there are thin little spines separated throughout the flesh. The snake is similar to the fishes; for the spinal column it has is spinous.

Among the egg-laying four-footed animals, the larger have a more bony skeleton, while the smaller have a more spinous one. But all the blooded animals have a spinal column, whether bony or spinous. The other parts of the skeleton are present in some animals, not in others, but in having the parts [of the body] they have, they also have the bones in these parts. For all the animals that do not have legs and arms do not have limb bones either; nor do all those that do have these parts, but not the same ones; for in those the bones differ by the more and less or by analogy.

As regards the nature of the bones, then, this is the way it is in the animals.

3.8
Cartilage

The cartilage is of the same nature as the bones, but differs from them by the more and less. And just as bone does not grow back together if cut, neither does the cartilage. In the live-bearing blooded terrestrial animals the cartilages are not perforated, and there is no marrow in them as there is in the bones. In the selachians (for these have cartilaginous spine), there is present in the ones that are large, in the cartilaginous part of the spinal column, the analog of the bones, and in these there is a marrow-like liquid. In the live-bearing footed animals there are cartilages around the ears, the nostrils, and some extremities of the bones.

3.9
Nails, Hooves, Claws, Horns, and Beaks

Further, there are other kinds of parts that do not have the same nature as the preceding ones, yet are not far from them in those animals that have these parts—for example, nails, hooves, claws, and horns, and in addition to these the beak, of the sort

128. The front legs.

the birds have. For these parts are bendable and splittable, while bones are neither bendable nor splittable, but shatterable.[129]

Also, the colors of the horns, nails, claws, and hooves follow along with the color of the skin and hair. For animals with black skin have black horns, hooves, and claws (whichever ones have claws), white-skinned animals have white ones, while those of intermediate color have intermediate-colored ones. It is the same way with nails. The teeth are in accord with the nature of the bones. That is why black people, like Ethiopians and those of this sort, while they have white teeth and bones, have nails that are black, like their entire skin.

Most horns are hollow from the point of attachment to the bone that grows inside them from the bone of the head, but at the extremity they have a solid tip; and they are simple: only those of the stag are solid throughout and multi-split. No other horned animal sheds its horns. The stag alone does this: each year unless it has been castrated. (The castrated animals will be spoken about later on.[130]) Horns are more attached to the skin than to the bone; that is why in Phrygia and elsewhere there are cows that can move their horns like their ears.

Among the animals that have nails (and all those that are toed have nails, and all footed ones have toes, except the elephant; it has undivided, slightly articulated toes, but has no nails at all)—among the animals that have nails, then, some are straight-
517[b]1 nailed, like the human being, others crook-nailed [or crook-taloned], like the lion, among the walkers, and the eagle, among the flyers.

3.10
Hair (1)[131]

As regards the hair and its analogs and the skin, the following are the ways they are.

All the live-bearing footed animals have hair; all the egg-laying footed ones have hard-scales; the fishes alone—that is, the ones that lay a crumbly egg[132]—have soft-scales; for, among the long fishes, the conger does not have this sort of egg, nor does the muraena, and the eel does not have eggs at all.

The coarseness, fineness, and length of hair differ with the places where it is and with the quality of the skin. For, for the most part, the more coarse-grained the skin is, the harder and coarser is the hair, while more and longer hair is in hollower and wetter places, if indeed the place is of the sort to have hair. It is likewise for the animals that have soft-scales and the ones that have hard-scales. In the ones with soft hair, abundant feeding makes it harder; in the ones with hard hair, softer and less plentiful.

129. *Mete*. 4.8–9.
130. 631[b]19–632[a]32.
131. Also *GA* 5.3–5.
132. 510[b]25–27.

Hair also differs with the hotness and coldness of the places where it is—for example, the hair of human beings is hard in the warm ones, soft in the cold ones. Again, straight hair is soft, curly hair hard.

3.11
Hair (2) and Skin

The nature of the hair is to be splittable. But hairs differ from one another by the more and less. In some animals they change little by little in hardness until they are no longer like hairs but like spines—for example, those of the hedgehog. It is much the same way in the case of the nails; for the nail kind in some of the animals is no different from bones in hardness.

As for skin, among all the animals, the human being's is the finest-grained in relation to size. Present in all skins is a viscous mucilaginous liquid, less in some, more in others, as, for example, in those of the cow, from which people make glue. (In some places glue is also made from fishes.) The skin by itself is without perception when cut: the sort on the head especially so, because between it and the bone there is the least flesh. Wherever the skin is by itself, if it is cut, it does not grow back together—for example, the thin part of the jaw,[133] the foreskin, and the eyelid. In all animals the skin is one of the continuous parts, and has gaps [only] where, in accord with nature, the ducts for evaporation of liquid are, and at the mouth and nails. All blooded animals have skin, but not all have hair, but things are as stated previously.[134]

The hair changes color with age and becomes white in the human being. This happens in the other animals, but not noticeably, except in the horse. The hair also becomes white at the extremities. But in most cases of grayness, the hairs are white from the outset, which makes it clear that grayness is not a sort of drying-up, as some people say; for nothing grows from being at the outset dried-up.

In the eruptive disease called "white sickness," all the hair goes gray; and certain cases have been observed where those who were ill went gray, but when they became healthy the hair fell out and grew back black. Hair becomes gray more if it is kept covered than in the open air.[135] The first thing to go gray in human beings are the temples; the front parts do so before the back parts; and last the pubic region.

In the human being alone among the animals some hair is innate, while some grows later in accord with the stages of life. Innate: that on the head, the eyelids, and the eyebrows; growing later: first, the pubic hair, then that under the armpits, and

133. The cheek.
134. $490^{b}25$–30, $498^{b}16$–$499^{a}12$, $517^{b}3$–8.
135. *GA* $785^{a}25$–32.

third that on the chin. For the places in which innate hair appears and those in which later hair does are equal in number.

The hair that falls out with age is first and foremost that on the head. But only that on the front; for no one goes bald at the back. Smoothness on the top of the head is called "baldness," on the eyebrows "forehead baldness"; neither of these occurs until sexual intercourse starts.[136] No boy goes bald, nor does a woman or a castrated man; if castration takes place before puberty, the later-growing hair does not grow; if after, only it falls out, except pubic hair.

Woman does not grow hair on the chin, except that in some cases a few hairs grow when menstruation ceases, and, for example, in the priestesses in Caria, where it is believed to be a sign of coming events when it occurs. The other sorts of late-growing
518[b]1 hair occur, but in lesser quantities. There are also men and women who from birth lack later-growing hair and are at the same time infertile; these are precisely the ones who lack pubic hair.

The various sorts of hair grow in proportion[137] more or less, especially on the head, then on the chin; and fine hair most of all. In some people, as they get older, the eyebrows become so thick that they have to be trimmed; this is because they are situated where bones join together, and as people become older these bones draw apart and allow more liquid to pass through. The hairs in the eyelashes do not grow in length, but fall out when sexual intercourse starts, and more so in the lecherous ones.[138] These are the hairs that go gray most slowly.

Hairs plucked out before the prime of life grow back again, then no longer do. Every hair has at its root a viscous liquid, and immediately after being plucked out it can lift up light objects when making contact with them.

Those animals that have variegated hair also have a similar variegation preexistent in the skin and the skin of the tongue.

As regards the beard, it happens that in some men the upper lip and the chin have thick hair, while in others, though these parts are smooth, the cheeks are hairy; the smooth-chinned ones are less likely to become bald.

The hair grows in certain diseases—for example, in cases of consumption it does so more, and in old age and after death, and it becomes harder instead of soft. And the same things occur with the nails.

In the lecherous ones, the innate hair falls out more; and the later-growing hair grows more. Those who have varicose veins go bald less, and if they get them after they go bald, in some the hair becomes thicker.

A hair does not grow where it is cut, but becomes longer by growing up from below. And the scales in the fishes become harder and thicker, and they become harder in those that become thin or old. When the four-footed animals become old

136. *GA* 783[b]26–27.
137. To the quantity of liquid residue produced. See *GA* 782[b]11–18, 744[b]24–26.
138. *GA* 774[a]36–[b]2.

the hair and the fleece become longer, but their quantity diminishes. The hooves or claws get large with age, as do the beaks of birds. Claws also grow, just like the nails.

3.12
Changes of Color

As regards the feathered animals, such as the birds, none undergoes a change [of color] with age, except the crane: while it is ash-colored, its feathers darken as it grows older. Because of seasonal conditions, like when it becomes very cold, sometimes single-colored birds change from black or a darkish color to white—for example, the raven, the sparrow, and the swallow; but no white kind has been seen to change to black. Also, the majority of birds so change their color in accord with the seasons that a person unfamiliar with them would not recognize them. **519ª1**

Some animals change the color of their hair in accord with changes in the waters; for the same sorts are white in one place, black in another. Also, as regards mating, the waters are in many places of such a sort that if rams mate after drinking it they beget black lambs—for example, in the district of Assyritis in the Chalcidian peninsula in Thrace the river called the "Cold" produced this effect. In Antandria too there are two rivers, one of which makes sheep white, the other black. It also seems that the river Scamander makes sheep yellow (*xantha*); that is why, they say, instead of "Scamander," Homer calls it the "Xanthus."[139]

The other animals do not have hair internally, and on the extremities have it on the upper surface, not on the underneath parts; the hare alone has hair both inside its jaws and on the underside of its feet. Further, the *mustokêtos*[140] does not have teeth in its mouth, but hairs like pigs' bristles.

Hairs that have been cut grow from below, not from above. Feathers, by contrast, grow neither from above nor from below, but fall out. The wing of the bee will not grow back when it is plucked out, nor will that of any other animal with an unsplit wing; nor will the sting, when the bee loses it; instead, the bee dies.

3.13
Membrane

There are membranes too in all blooded animals. The membrane is like dense, fine-grained skin, but it is of a different kind; for it is neither splittable nor stretchable. There is membrane around each of the bones and around each of the viscera, both

139. *Iliad* 20.74.
140. Reading μυστόκητος ("mouse-whale").

in the large and in the small animals; but they are invisible in the very small ones,
519b1 because they are altogether fine-textured and small.

The largest membranes are the two around the brain:[141] the one around the bone is stronger and thicker than the one around the brain itself; next is the membrane around the heart. A bare membrane, once cut, does not grow back together; bones bared of membranes become gangrenous.

3.14
The Omentum

The omentum is also a membrane. All the blooded animals have an omentum; in some it is fatty, in others it is without fat. Its starting-point and its point of attachment in the live-bearing animals that have two rows of teeth is in the middle of the stomach, where there is a sort of suture in the stomach; in those that do not have two rows of teeth it is in the large stomach in the same way.

3.15
The Bladder

The bladder too is membranous, but is of a different kind than membrane; for it has elasticity. Not all animals have a bladder; all the live-bearing ones do, but among the egg-laying ones only the turtle does. The bladder, once cut, does not grow back together again, unless the cut is at the starting-point of the urethra, except altogether rarely; for something of this sort has been observed to occur. In dead animals no liquid [residue] is passed through it; in living animals, solid compositions also are, from which stones come to be in those who suffer from them. In some people compositions of this sort have been observed in the bladder that seem not to differ at all from shellfishes.

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As regards blood vessel, sinew, and skin, as well as fibers and membranes, then, and as regards hair, nail, claw, hoof horn, teeth, beak, cartilage, bones, and their analogs, these are the ways they are.

3.16
Flesh

Flesh and what has much the same nature as flesh is present in the blooded animals—in all cases between the skin and the bone or the parts analogous to the bones; for

141. The meninges (514a17).

as spine (in those that have spine) is to bone (in those that have bones) so what is flesh-like is to the flesh.

Flesh is divisible in every way, not lengthwise only, like the sinews and the blood vessels. When animals become thin, the flesh disappears, and the blood vessels and fibers become [apparent]; when they are abundantly fed, fat replaces flesh. In animals having a lot of flesh, the blood vessels are smaller, the blood redder, and the intestines and stomach small. In those that have large blood vessels, the blood is blacker, the intestines large, and the stomach large, and the quantity of flesh smaller. Animals that have small stomachs become fat in their fleshy parts. **520^{a}1**

3.17
Fat and Suet (1)

Fat and suet differ from each other. For suet is shatterable in every way and solidifies when made cold, while fat is liquefiable but not solidifiable. Soups made from fatty meats—for example, those of the horse and the pig—do not solidify, while those made from meats that have suet—for example, those of the sheep and the goat—do solidify. They also differ in their places; for fat occurs between the skin and the flesh, while suet does not occur there but at the ends of the fleshy parts. The omentum in fatty animals is fatty, and in suety animals is suety. Animals that have two rows of teeth have fat. Those that do not have two rows have suet.

Among the viscera, the liver in some animals becomes fatty—for example, among the fishes, the selachians; for an oil is produced from these when they become melted. The selachians themselves are not fatty at all, having no separated fat against their flesh or their stomach. The suet in the fishes too is fatty and does not solidify.

All animals have fat, some against their flesh, some separately. Those who do not have separated fat are less fatty than others in stomach and omentum—for example, the eel; for it has little fat around the omentum. Most animals become fat in the abdomen, especially the animals that are not [much] in movement.

The brains of fatty animals are oily[142]—for example, the pig; those of suety animals are dry [of oil].

Among the viscera, it is around the kidneys that animals most become fat; the right kidney is always less fatty than the left; and if both are very fat, there is always a gap between them that is fatless. It is around the kidneys that suety animals most become suety, and most of all the animals, the sheep; for it dies when its kidneys are on every side covered by suet. The kidneys become covered due to abundant feeding, as in the region of Sicily around Leontini; that is why they do not drive the sheep out to feed until late in the day, in order to reduce the nourishment they take. **520^{b}1**

142. *PA* 652^{a}24–33.

3.18
Fat and Suet (2)

Common among all animals is the part of the eye around the eye-jelly;[143] this part is, in fact, suety in all the ones that have eye-jelly in their eyes and are not hard-eyed.[144]

All fatty animals, both male and female, are less fertile.[145]

All animals fatten more when older than when younger, and do so most when they achieve their [proper] magnitude in breadth and length but grow in depth.

3.19
Blood and Serum

As regards the blood, it is the following way. It is the most necessary and the most common part in all the blooded animals; it is not something acquired later, but is present in all those that have not passed away. All blood is in a vessel, which are called "blood vessels," and nowhere else except in the heart alone. Blood has no perception in any of the animals when they are touched, any more than the residue in the stomach does. The brain and the marrow have no perception of being touched either. Wherever the flesh is cut in a living animal, blood is produced, provided the flesh is not corrupted. It is the nature of blood to have a sweet flavor and a red color, if it is in a healthy condition. But if it is in a lesser one, either by nature or due to disease, it is blacker. The best blood is neither very coarse-grained nor very fine-grained, unless it is in a lesser condition either due to nature or due to disease. Inside a living animal, it is always liquid and hot, but on going outside the blood of all animals solidifies, except for the deer, the roe deer, and other animals that have this sort of nature. All other blood solidifies, unless the fibers are removed. The fastest of all to solidify is the blood of the bull.

Among the blooded animals, those that are both internally and externally live-bearing have more abundant blood than the blooded egg-laying animals. Animals that are in good condition, either by nature or by being [kept] healthy, do not have too much blood, like those that have recently been drinking do, nor too little, like animals that are too fat; for fat ones have blood that is pure but little in quantity, and the fatter they become the less blood they have; for fat is bloodless. Fat does not
521ᵃ1 putrefy, but the blood and the blooded parts putrefy most quickly, and among these parts, the parts around the bones.

It is the human being that has the most fine-grained and purest blood, and, among the live-bearing animals, the bull and the ass have the most coarse-grained and the

143. The white of the eye.
144. *PA* 657ᵇ29–658ᵃ3.
145. *GA* 726ᵃ3–6.

blackest. In the lower parts of the body the blood is more coarse-grained and blacker than in the upper parts.

The blood in the animals beats at the same time in all the blood vessels in every part. And the blood alone is the only liquid in the animals that is present throughout the entire body and always, for as long as they live. The blood in the animals comes about first in the heart, even before the body as a whole becomes articulated. If they have blood taken or if it is emitted in a relatively large quantity, animals faint; if the quantity is too large, they die. If the blood is too liquid, animals fall ill; for it becomes like serum—in fact it becomes so serum-like that cases have been observed of people sweating a bloodlike sweat. In some cases, when the blood goes out, it does not solidify at all, or only in distinct and separate places. In those who are asleep, the blood in the outside parts is smaller in quantity [than when they are awake], so that if they are pricked, it does not flow to the same extent.

Blood is produced by concoction from serum, and from blood fat. Diseased blood produces hemorrhoids in the nostrils and around the fundament, also varicose veins. Blood that putrefies in the body becomes pus, and from pus a solid mass develops.

The blood of females differs from that of males; for it is coarser-grained and darker in females of similar health and age to males, and though there is less on the surface in females, on the inside they have more abundant blood. Among female animals, it is the woman that has the most abundant blood, and the so-called menses are largest in quantity in women among all animals. This blood, when it is diseased, is called "flux." Women share less in these diseases than men; for few women get varicose veins, hemorrhoids, or nosebleeds; but if any of them do occur, the menses are lesser.[146]

Blood also differs in quantity and quality with age; for in altogether young animals it is serum-like and greater in quantity; in old ones it is coarse-grained, black, and small in quantity; in those in their prime it is in the mean. The blood of aged animals solidifies quickly, even if it is on the surface of the body; in the young ones this does not occur. **$521^{b}1$**

Serum is unconcocted blood; either blood that is not yet concocted or that has become serum-like.

3.20
Marrow and Milk (1)

Next is marrow; for it too is among the liquids that exist in certain blooded animals. All the liquids that by nature exist in the body are in vessels, just as blood is in blood vessels, marrow in bones, and others are in membranes, skins, or cavities.

In young animals the marrow is altogether bloodlike; among older ones, that of fatty animals becomes fatty, that of suety ones suety. Not all bones have marrow, but

146. $587^{b}32–34$.

only the hollow ones, and even in some of these it is not present; for among the bones of the lion, some have none altogether, while others have little. That is why some people say that lions have no marrow at all, as was said previously.[147] And in the bones of pigs there is little, though in some of them there is none altogether.

The liquids we mentioned are pretty much always innate in the animals, though milk and semen are produced after birth. Of these, milk, when it is present, is in all cases produced as a secretion; but semen is not produced in this way in all animals, but rather so-called seminal fluids are produced in certain ones—for example, the fishes.

All the animals that have milk have it in the breasts. All animals that are both internally and externally live-bearing have breasts—for example, all the ones that have hair, such as the human being and the horse; and also the cetaceans—for example, the dolphin, the porpoise, and the whale; for these also have breasts and milk. Those that are externally live-bearing only, or that are egg-laying, do not have either breasts or milk—for example, the fishes and the birds.

All milk contains a watery serum, which is called "whey," and a corporeal part, which is called "curd"; the more coarse-grained the milk, the more curd it has. The milk of the animals that do not have two rows of teeth solidifies (that is why the milk of the tame ones is made into cheese), but that of the ones with two rows of teeth does not solidify, any more than their fat does, and is fine-grained and sweet. The finest-grained of all milk is the camel's, second, that of the horse, third, that of the ass; the coarsest-grained is that of the cow. Milk does not solidify due to the cold, but becomes more serum-like; on the fire, though, it solidifies and becomes coarse-grained.

For the most part, milk is not produced in any animal until pregnancy. But when the animal is pregnant, it is produced; the first milk is unusable and later on is so again. In non-pregnant animals, a small quantity of milk is produced due to certain foods; and, indeed, cases have been observed of elderly women who, on being milked, produce some, and in certain cases enough to suckle a baby.

The people around Mount Oeta take female goats that refuse to mate and forcibly rub their udders with nettles, because that is painful. What is squeezed out is first bloodlike, then mixed with pus, and finally milk that is no less in quality than from those that were mated.

For the most part, milk is not produced in any males, either in the other animals or in the human being. Nonetheless, it is produced in some cases; thus in Lemnos, from the breasts of a male goat, of which he had two near the sex organ, milk was squeezed in sufficient quantities to make cheese; and again, after mating, the same thing occurred in the male as a result of mating. But things of this sort are regarded as signs; thus, to the man in Lemnos the god responded by prophesying that he would gain further possessions. In certain men, after puberty, a small quantity of milk can

147. 516b7–9.

be squeezed out; and from some, when milked, large quantities have been observed to come out.

Milk has in it a fatty element; in milk that has solidified it even becomes oily. People mix goats' milk into sheep's milk in Sicily, and wherever it is fat.[148] The milk that solidifies most is not only that which has the most cheese, but also that in which the cheese is drier [of fat].

Some animals have more milk than is needed for the nourishment of their offspring, and this is useful for cheesemaking and for storage, especially goats' milk and sheep's milk, then cows' milk. Horses' milk and asses' milk are mixed together to make Phrygian cheese. There is more cheese in cows' milk than in goats' milk; for herdsmen say that from one amphora of goats' milk they can get nineteen one-obol cheeses, but thirty from cows' milk.

Other animals have only enough milk for their offspring, and none has abundant milk or milk useful for cheesemaking—for example, those with more than two breasts; for none of these has abundant milk nor is the milk made into cheese. **$522^{b}1$**

Milk is curdled by fig juice and rennet. The fig juice is squeezed out into wool. When the wool is rinsed again, it is put into a little milk; for this milk, when mixed in, causes milk to curdle. Rennet, for its part, is milk; for in the case of animals that are still being suckled, it is produced in their stomach.

3.21
Rennet and Milk (2)

Rennet, then, is milk that contains the fire that comes from the heat of the animal when the milk is being concocted [in the stomach]. All ruminants have rennet and, among those with two rows of teeth, the hare. Rennet is better the older it is; this sort is mostly advantageous for diarrhea, as is that of the hare; but best is that of the faun.

There is difference of the more or less in the milk yielded by the animals that have milk, which is in accord with the size of their bodies and the differences in their foods—for example, there are small cows in Phasis each of which produces a lot of milk, and large ones in Epirus each yield an amphora and a half from their two breasts (the milker stands upright, bending forward a little, because he would not be able to reach them when seated). But, apart from the ass, all the four-footed animals in Epirus are large, and the largest are the cows and the dogs. Large animals need more pasture; but this land has a lot of abundant feeding of this sort and places suitable for it in each season. The very large cows and sheep are called "Pyrrhic," taking this name from King Pyrrhus.

148. Reading πῖον.

Some nourishment dries up the milk—for example, Median grass,[149] especially in ruminants. Other sorts produce more—for example, cytisus and bitter vetches, except that cytisus when in bloom is not advantageous (for it burns), and for pregnant animals bitter vetches are not advantageous (for they make giving birth more difficult). In general, just as those four-footed animals that are able to eat [well] are advantaged with regard to pregnancy, so they produce a lot of milk when they have [good] nourishment. Some of the foods that produce wind also produce milk—for example, a large quantity of beans for the sheep, the goat, the cow, and the small goat; **523ᵃ1** for they lengthen the udder. A sign of yielding a lot of milk is when the udder faces downward before giving birth. Milk is produced for a long time in all those animals that have it, if they are not mated and have suitable foods; most of all, among four-footed animals, the sheep; for it can be milked for eight months.

In general, the ruminants yield a lot of milk and it is useful for cheesemaking. Around Torone, the cows leave an interval of a few days before giving birth, but all the rest of the time have milk. In women, milk of a more blue-tinged color is better than white milk for suckling infants; and the milk of dark-skinned women is healthier than that of pale women. The most nourishing milk is that which contains the most cheese, but milk that contains less is healthier for little children.

3.22
Seed

All blooded animals emit seed.[150] What it contributes to generation and how it does so will be discussed elsewhere.[151] In proportion to [size of] body, the human being emits the most seed. It is viscous in animals that have hair, but in others it does not have viscosity. It is white in all of them: Herodotus is mistaken when he writes[152] that Ethiopians emit black semen.

Seed is white and coarse-grained when it emerges, if it is healthy; but when it is outside, it becomes fine-grained and black. In times of frost, it does not solidify but becomes altogether fine-grained and watery both in color and consistency; due to heat, it solidifies and becomes coarse-grained. When it remains in the uterus for a time, it emerges coarser-grained and, sometimes, dry and compact. The fertile sort sinks to the bottom in water. The infertile sort dissolves. What Ctesias wrote[153] about the semen of elephants is false too.

149. Probably alfalfa (*Medicago sativa*).
150. Seed is semen in this chapter.
151. In *GA*.
152. 3.101.
153. *GA* 736ᵃ2–9.

BOOK 4

4.1
Bloodless Animals: Soft-Bodied Animals

As regards the blooded animals, then, what parts they have in common and what ones are special to each kind, both the non-uniform ones and the uniform ones, both external and internal, was stated previously. The bloodless ones must now be spoken about.

There are many kinds of these. One is that of the so-called soft-bodied animals. **$523^{b}1$** These are all the ones which, being bloodless, have their fleshy part outside, and their solid part, if any, inside, as in the case of the blooded animals—for example, the cuttlefish kind.

Another one is that of the soft-shelled animals. These are all the ones that have the 5 solid part outside and the soft fleshy part inside; the hard part of these is not receptive of impressions but is shatterable;[154] the crayfish kind, for example, and the crab kind are of this sort.

Further, there are the hard-shelled animals. Of this sort are those that have their fleshy part inside and their solid part—which is shatterable and breakable, but not 10 receptive of impressions—outside. The snail kind and that of the shellfishes are of this sort.

The fourth kind is the insect kind, which includes many dissimilar forms of animals. The insects are all the animals that, as their name implies, have either their underneath parts, back parts, or both in sections, and do not have either a separate bony part or fleshy part, but something intermediate between the two; for their 15 body is similarly hard both on the inside and outside. There are wingless insects (for example, the centipede and the millipede) and winged ones (for example, the bee, the cockchafer, and the wasp); and the same kind is in some cases both winged and wingless (for example, the ant is both winged and wingless, and the so-called 20 glowworm too).

The external parts of the so-called soft-bodied animals are as follows: first, the so-called feet; second, continuous with these, the head; third, the cavity, which encompasses the internal parts, and which some people—wrongly—call the head; and further, the fins, which are in a circle around the cavity. 25

In all soft-bodied animals the head is between the feet and the abdomen. All of them have eight feet, and all of these have a double row of suckers, except in the case of one kind of octopus.[155] A special affection of the cuttlefishes, the small calamary, and the large calamary is that they have two long proboscises, having two rows of 30

154. *Mete.* 4.8–9.
155. $525^{a}16–20$.

suckers on a roughness at the extremities, with which they grasp their nourishment and bring it to their mouth, and when the weather is stormy, they throw them around a rock like anchors, and ride out the storm. With their fins, which they have around
524ᵃ1 the cavity, they swim. On the feet of all of them there are suckers.

The octopus uses its tentacles both as feet and as hands. It brings in [nourishment] with the two that are above its mouth. The last tentacle, which is most sharp and is
5 the only one that is whitish in color and divided in two at the extremity (this division goes to the rachis; "rachis" is what the smooth part is called that is further out from where the suckers are), this is the tentacle it uses in mating.[156] In front of the cavity and above the tentacles they have a hollow funnel through which they emit from the
10 cavity any seawater they may have taken in when they are taking some [nourishment] into their mouth. The octopus turns this about, sometimes to the left, sometimes to the right, and it is with this that it emits its ink.

The octopus swims obliquely, in the direction of the so-called head, by extending its feet; in this way of swimming it can look forward (for its eyes are on the upper
15 side); it has its mouth at the rear. While it is alive, its head is hard, as if it were inflated. It touches and holds its prey with the underneath parts of the tentacles, and the membrane that is between its feet is kept fully extended; but if it falls on the sand, it can no longer hold it.

20 The octopuses and the other soft-bodied animals mentioned exhibit a difference; for the cavity of the octopuses is small and the feet long, while among the others, the cavity is large and the feet short, so that they cannot move by walking on them. In comparison to each other, the calamary is longer and the cuttlefish is broader.
25 Among the calamaries, the so-called large calamaries are much longer; for some reach five cubits in length. Some cuttlefishes too reach two cubits; and the tentacles of the octopus can be as long as this, or even longer. The large calamary kind is few in number. The large calamary differs from the small calamaries in shape: the sharp part
30 of the large calamaries is broader. Further, the circle of its fins goes all around the cavity; in the small calamary it has a gap. The large calamary is a deep-sea dweller, like the small calamary.

In all cases the head comes after the feet, in the middle of the feet or "tentacles," as
524ᵇ1 they are called. Of this one part is the mouth, in which there are two teeth; above it are two large eyes, between which is a small cartilage containing a small brain. Inside
5 the mouth is a small fleshy part; none of them has a tongue, but this part is used in place of a tongue.

After this, on the outside, can be seen what appears to be a cavity. The flesh of this can be split, not lengthwise but in a circle. All the soft-bodied animals have skin around this part. After the mouth they have an esophagus that is long and narrow,
10 and, following it, a crop that is large and round, like a bird's. This is followed by the stomach, like the abomasum; its shape is like the spiral in trumpet shells. From this

156. *GA* 720ᵇ32–36.

a thin intestine goes back again toward the mouth: this intestine is thicker than the esophagus.

None of the soft-bodied animals has viscera, but only what is called a *mutis*, and on it is the ink sac. The cuttlefish has the most ink and the largest sac. All of them emit ink when they are frightened, especially the cuttlefish. The *mutis* is situated under the mouth, and through it the esophagus extends. Below the point where the intestine extends upward is the ink sac, which is encompassed by the same membrane as the intestine, and through the same duct emits both the ink and the residues. These animals have certain hair-like growths[157] on the body.

In the cuttlefish, the small calamary, and the large calamary, the solid parts are in the inside, toward the back of the body; they are called the "sepium" and the "sword." But there is a difference: sepium is strong and broad, intermediate between spine and bone, and has in it a crumbly spongy material; in the calamaries it is fine-grained and cartilaginous. They differ from each other in shape, as do their cavities. The octopuses do not have any solid part of this sort inside, but cartilage around the head, which becomes hard if the animal gets older.

The females differ from the males; for the males have a duct below the esophagus, extending from the brain to the lower part of the cavity; and the part it extends to is similar to a breast. In the females, by contrast, there are two of these parts situated higher up. In both sexes, below these parts, there are also certain small red corpuscles. **525^{a}1**

The egg[158] of the octopus is a single one, irregular on the outside, and large; inside, the liquid is all single-colored and smooth, its color is white. The magnitude of the egg is so great that it fills a vessel larger than the octopus' head. The cuttlefish has two cavities with a lot of eggs in them, similar to white hailstones. The situation of each of these parts must be observed in the diagram in the *Dissections*.

In the case of all these animals, the males differ from the females, especially the cuttlefish; for the back of the cavity, which is blacker than the underneath part, is rougher in the male than in the female; and the male's back is variegated with stripes and the rump more pointed.

There are many kinds of octopuses. The first is the one that keeps most close to the surface and is the largest of them (the ones that keep inshore are much larger than the deep-sea ones); and further, there are others, small variegated ones, and not for eating. There are two others, one called *heledônê*, which differs in the length of its feet and in being the only soft-bodied animal with one row of suckers (all the rest have two rows), and the other, the one sometimes called *bolitaina*, sometimes *ozolis*.[159] There are two others that live in shells. One is called by some people the "nautilus" or "pontilus," by others the "octopus' egg." Its shell is like a valve of a detached deep scallop shell. This one often lives near the land, and sometimes gets washed ashore by

157. Probably the gills.

158. The egg-mass.

159. $621^{b}17$. The names mean "onion" and "smelly." Probably, *Eledone moschata*.

the waves; when its shell falls away, it is stranded, and dies on the land. These animals are small; their appearance is like that of the *bolitaina*. And there is another that lives in a shell like a snail; it does not emerge from its shell, but stays inside like a snail, and sometimes puts out its tentacles.

The soft-bodied animals have now been spoken about.

4.2
Soft-Shelled Animals

Among the soft-shelled animals, one kind is that of the crayfishes, and another much the same as this is that of the so-called lobsters; these differ from the crayfishes in having [large] claws; the other sorts of differences are not numerous. Another one is that of the carids,[160] and another that of the crabs.

There are many kinds of carids and of crabs. Among the carids are the hunchbacks, **525b1** the *kraggôn*,[161] and the small kind (for these never become larger). The kinds of crabs are multifarious and not easy to enumerate. The largest is the one they call *maia*; second are the *pagouroi*,[162] the Heracleotic crabs,[163] and further, the river crabs. The others are smaller and more often nameless. In Phoenicia, crabs occur on the beaches that are called "horses," because they run so fast that it is not easy to catch them; when they are opened up, they are empty because of not having food to eat. There is also another small kind like the crabs, but its appearance is like that of the lobsters.

All these animals, as was said previously, have the solid shell-like part on the outside in place of the skin, and the fleshy part inside; the underneath parts are more laminar: this is where the females lay their eggs.

The crayfish have five feet on each side with claws at the extremities; likewise, the crabs have ten feet in total, including the claws. Among the carids, the *kuphai* have five feet on each side, with those toward the head being sharp-pointed, and five more on either side on the abdomen, the extremities of which are broad. They have no flaps on the underneath parts, but their back parts are like those of the crayfishes. It is contrariwise with the *kraggôn*: it has four primary feet on either side, then three thin ones next to them on either side; the remaining larger part of the body is footless. All these animals bend their feet obliquely like the insects; the claws, in those that have claws, bend inward. The crayfish has a tail too and five fins; the hunchback has a tail and four fins; the *kraggôn* also has fins on each side of the tail. The middle part of the tail of both the hunchback and the *kraggôn* is spinous, though in the latter it is broad, in the hunchback it is pointed. The crab alone among these sorts of animal

160. Small soft-shelled animals other than crabs or lobsters.
161. Squillae.
162. Probably the common edible crab.
163. *PA* 684a10.

does not have a tail; and while the body of the carids and the crayfishes is elongated, that of the crab is round.

The male crayfish differs from the female; for in the female the primary foot is divided, while in the male it is undivided; the fins on the underneath part in the **526ª1** female are large and overlap near the neck, while in the male they are smaller and do not overlap. Further, in the male there are large sharp projections like spurs on the last feet, while in the female these are small and smooth. Both sexes alike have two 5 antennas in front of the eyes that are large and rough, and other small antennas below that are smooth.

The eyes of all these animals are hard and move to the outer side, the inner side, and obliquely. It is likewise in most of the crabs—even more so. 10

The lobster has an all-over whitish color, sprinkled with black. Its under-feet, up to the large ones, are eight in number, and after them come the large ones, which are much larger and broader at the extremities than those of the crayfish, and unlike each other; for in the right one the broad extremity is elongated and thin, while in the left 15 one it is thick and rounded. At the extremity each is divided like a jaw that has teeth above and below, except that in the right one they are all small and saw-like, while in the right one, though they are saw-like at the extremity, those on the inside are like molars, in the lower part of it there are four joined together, and in the upper there 20 are three and they are not joined together. In both the upper part moves and presses hard against the lower part. Both are set like bandy legs, as is natural for grasping and pressing hard. Above the large ones there are two other hairy ones, a little below 25 the mouth, and underneath these are the gill-like parts around the mouth, which are hairy and numerous. The animal always keeps these in movement; it bends the two hairy feet and draws them in toward the mouth. The feet near the mouth also have thin appendages.

The lobster has two teeth,[164] like the crayfish, and above them are the antennas, 30 which are long, but shorter and much thinner than those of the crayfish, and it has four others similar in shape to these, but shorter and thinner. Above these are the eyes, small and short,[165] not large like those of the crayfish. The sharp and rough part **526ᵇ1** above the eyes, just like a forehead, is larger than that of the crayfish. In general, the facial part is more pointed and the thorax much broader than in the crayfish, and the whole body fleshier and softer. Of the eight feet, four are divided in two at the 5 extremity and four are not. The region around the so-called neck is divided externally into five parts; a sixth one is the broad region at the extremity, which has five flaps; the inner parts, where the females lay their eggs, are four in number and hairy. On 10 each of the parts mentioned the lobster has, pointing outward, a spine that is short and straight. The whole body and the parts around the thorax are smooth, not rough as in the crayfish; but the large feet have on the outside larger spines. Between the

164. Mandibles.
165. I.e., less projecting.

female and the male there is no apparent difference; for in fact both the male and the female have one claw (whichever it happens to be) larger than the other, but neither sex ever has both of equal size.

Seawater is taken in by a part beside the mouth in all animals of this sort; the crabs, having taken it in,[166] emit it by closing up this part a little; the crayfishes emit it beside their gill-like parts; the crayfishes have many gill-like parts.

Common to all these animals are the following: they all have two teeth (for even the crayfishes have two primary ones), and in the mouth they have a part more fleshy [than these] in place of a tongue; then they have a stomach right next to the mouth, except that the crayfishes have a small esophagus in front of the stomach, then from the stomach there is a straight intestine. This extends, in the crayfish-like animals and the carids, in a straight line to the tail, where they emit the residues and lay the eggs; but in the crabs, it is where they have the flap, and the middle of the flap is where they lay the eggs (for they also lay them outside). Further, the females of these have near the intestine the place for the eggs. And they all have, more or less, the so-called *mutis*, or *mêkôn*.

But the special differences of each of these animals must also be observed.

527ᵃ1 The crayfishes, then, as was said, have two teeth, which are large and hollow, in which there is a humor similar to the *mutis*, and between the teeth a fleshy part that is tongue-shaped. After the mouth there is a short esophagus, and following it a stomach that is membranous, and by its orifice there are three teeth, two of them opposite each other and one below. Coming from the side of the stomach is an intestine that is simple and of equal thickness throughout its whole length until it reaches the outlet for the residue. The crayfishes, the carids, and the crabs all have these parts; for the crabs also have two teeth.

Further, the crayfishes have a duct attached going from the chest to the outlet for the residue. In the female this serves as a uterus, in the male as a duct for the seminal fluid. This duct is attached to the concave surface of the flesh in such a way that the flesh has an intermediate position; for the intestine is situated on the convex side, the duct on the concave, similar to the way they are in the four-footed animals. That of the male is no different from that of the female; for in both it is thin, white, and contains a yellow liquid, and further, both are attached to the chest.

This is also the way the egg and the spirals[167] are in the carids. The male has a special affection in comparison to the female: in the flesh that is on its chest it has two white parts, each by itself, that in color and consistency are like the proboscises of the cuttlefish, and spiral like the *mêkôn* in the trumpet-shell. The starting-point of these is in the cotyledons, which are under the last of the feet. In this place the flesh is red and bloodlike in color, but viscous to the touch and not like the flesh. From the trumpet-shell-like part on the chest there is another spiral, like string in

166. Reading ἐπιλαμβάνοντες.
167. *PA* 680ᵃ22.

thickness. Below these parts there are two crumbly ones attached to the intestine that are seminal. These, then, are the parts in the male. The female has eggs, red in color, that are attached to the stomach and to each side of the intestine as far as the fleshy part; these are encompassed by a thin membrane.

These, then, are all the internal and external parts of these animals.

4.3[168]
Crabs

The internal parts of the blooded animals happen to have names; for all these have the internal viscera. On the other hand, none of bloodless animals does, though common to these and all the blooded animals are the stomach, the esophagus, and the intestine. **527^b1**

As for the crabs, as regards the claws and feet, that they have them and the way they have, was stated previously.[169] For the most part, all have the right claw larger and stronger than the left. As regards the eyes, it was also said previously[170] that in most of them they look to the side. The trunk of the body is an undivided unit, which includes[171] the head and any other part (if there is one). Some of them have eyes on the upper side immediately below the back and very far apart; others have them in the middle and close together—for example, Heracleotic crabs and the *maia*.[172] The mouth is below the eyes, and in it are two teeth, as in the crayfish, except that they are not round but long. Over the teeth there are two lids, and between these are some entities like the ones the crayfish has beside its teeth. The crab takes in water beside its mouth, pushing it away with the lids, and discharging it through the upper ducts of the mouth, while closing with the lids the orifice from where it came in. These ducts are immediately under the eyes; and when it takes in the water, it closes its mouth with the two lids and in this way spews out the seawater.

Following the teeth is the esophagus, which is altogether short, so that it seems that the stomach comes immediately after the mouth. The stomach that follows the esophagus is divided in two, and coming from the middle is the intestine, which is simple and thin; the intestine ends under the exterior lid, as was said previously.[173] {Between the lids it has some entities like the ones the crayfish has beside its teeth.}[174]

168. This chapter mostly repeats what has already been said, and contains some sentences, enclosed in curly brackets, that seem to be glosses.
169. $525^b16–17$.
170. 526^a9.
171. Reading ἢ τε.
172. $525^b4–8$, 587^a9, 22, 601^a18.
173. $526^b26–30$.
174. Secluded as a near repetition of 527^b16.

Inside the trunk is a yellow humor, small parts that are elongated and white, and other ones that are sprinkled with red.

The male differs from the female in size, in breadth, and in the lid; for in the female this is larger, stands out more, and is more thickly covered [with hair],[175] just as in the case of the female crayfishes.

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These, then, are the ways the parts of the soft-shelled animals are.

4.4
Testaceans

The hard-shelled animals—for example, the land snails, sea snails, all the so-called **528a1** shellfishes, and further, the urchin kind—have the fleshy part (in the ones that have flesh) in the same way as in the soft-shelled animals (for they have it inside), but the shell outside, and there is no hard part inside. Compared with one to another, these animals exhibit many differences, both with respect to their shells and with respect to the flesh within.

For some of these have no flesh at all—for example, the urchin; others have it, but it is all inside and invisible, except for the head—for example, the land snails and the *kokalia*, as they are called by some people, and, among sea animals, the purpura, the trumpet-shell, the sea snail, and the other spiral-shelled animals. Among the others, some are bivalves, others univalves; by "bivalves" I mean those that are encompassed by two shells, by "univalves" those that are encompassed by one. In the latter, the fleshy part is exposed—for example, the limpet. Among the bivalves, some can open—for example, the scallop and the mussel; for all animals of this sort are joined on one side and parted on the other, so that they can close and open. Some, though bivalves, close equally on both sides—for example, the razor fish. Some are wholly encompassed by their shell and no part of their flesh is bare on the outside—for example, the so-called sea squirts.

Further, their shells themselves exhibit differences from each other. For some have smooth shells—for example, the razor fish, the mussel, and some of the clams (the ones that some people call "milk shells"); others have rough shells—for example, lagoon oysters, pinnas, some kinds of clams, and the trumpet-shells; and among these, some have ribbed shells (for example, the scallop and a kind of clam), while others are ribless (for example, the pinna and another kind of clam).

They also differ in the thickness and thinness of their shells, whether in the whole shell or with respect to a part—for example, the lips; for some have thin-lipped shells (for example, the mussels), while others have thick-lipped ones (for example, the lagoon oysters). Further, some of them are mobile—for example, the scallop (in fact

175. 541b30.

some people say that scallops can fly, since in fact they often jump out of the instrument with which they are caught); others cannot move from what they are attached to—for example, the pinna. All the spiral-shelled animals move and creep; even the limpet releases itself to feed. Common to these and to the other hard-shelled animals **528^{b}1** is that the shell has a smooth interior.

In the univalves and the bivalves, the fleshy part is so attached to the shells that it is detached [only] by force; in the spiral-shelled animals it is more easily detached. Special to all the latter as regards the shell is the spiral that belongs to the extremity of 5 the shell furthest from the head. Further, all of them from birth have an operculum. Further,[176] all the hard-spiral-shelled animals have the shell on the right side, and they move not in the direction of the spiral, but in the opposite direction.

These, then, are the differences exhibited by the external parts of these sorts of 10 animals.

As for the internal parts, they have a nature that is in a way much the same, especially the spiral-shelled animals (for these differ from each other in size and with respect to excess [and deficiency] in their affections); nor do most[177] of the univalves and bivalves differ much. For they exhibit but little difference in relation to each 15 other, but much more in relation to the ones that are immobile. This will be more evident later on.[178]

The nature of all the spiral-shelled animals is the same, differing, as was said, with respect to excess [and deficiency] (for the larger ones have larger and more clearly perceptible parts, while the smaller have the opposite), and further, in hardness and softness, and other affections of this sort. For the fleshy part, which they all have at the 20 outermost part of the mouth of the shell, is firm—more so in some, less so in others. From the middle of this come the head and the two horns: these horns are large in the larger ones and altogether small in the smaller ones. In all of them the head emerges 25 in the same way; and if the animal is frightened, it draws it inside again. Some of them, like the snail, have a mouth and teeth that are small and thin. They also have a proboscis, as flies also do, which is tongue-shaped. The trumpet-shells and the murex also have one that is firm, and, just as the horsefly and the gadfly pierce the skins of 30 the four-footed animals, its strength is yet more forceful; for they pierce the shells of the bait used to capture them.[179] The stomach comes immediately after the mouth. The stomach of the snail is like a bird's crop. Underneath, it has two firm white **529^{a}1** entities, like breasts, of the sort that also appear in the cuttlefish, except that there they are firmer. From the stomach a simple long esophagus extends as far as the *mêkôn*, which is in the base [of the shell]. All these parts are clear to perception both 5 in the purpuras and the trumpet-shells and are in the spiral of the shell.

176. Reading ἔτι.
177. Reading τὰ πλεῖστα.
178. The reference may be to *PA* 4.7.
179. *PA* 661^{b}21.

Following the esophagus there is the intestine (the esophagus and the intestine are continuous), which is entirely simple up to the outlet [for the residue]. The starting-point of the intestine is around the spiral of the *mêkôn*, and there it is broader (for much of the *mêkôn* is a sort of residue in all of the shelled animals), then bending and going upward again toward the fleshy part, the intestine ends near the head, where it emits the residue; it is likewise in all the spiral-shelled animals, both terrestrial and marine. In the large snails, woven along the esophagus from the stomach, there is a long white duct enclosed in a membrane, similar in color to the breast-like formations above. It has sections, like the egg of the crayfish, except that its color is white, while the latter's is red. It has no outlet or duct at all but is inside a thin membrane, with a narrow cavity inside it. From the intestine downward black rough entities extend in a continuous line, like those in the turtle, except less black. The sea snails also have these and the white entities, except that they are smaller in the smaller ones.

The univalves and bivalves are in some respects similar to the spiral-shelled animals and in some respects dissimilar. For they have a head, horns, mouth, and the tongue-shaped part; but in the smaller ones these are invisible because of their smallness in size; even in dead animals or ones that are not moving some of them are invisible. All of them have the *mêkôn*, although not all in the same place, or of the same size, or equally visible: the limpets have it below in the depths [of the shell], while the bivalve have it in hinge-like part. They all have the hair-like growths too, in a circular pattern, as, for example, in the scallops. The so-called egg in those that have it, when they have it, is situated on one of the semicircles of their circumference and is like the white entity in the snails; for these two things are the same.

But all these parts, as was said, while clear to perception in the larger animals, in the smaller ones are not at all clear or scarcely so. That is why they are especially visible in the large scallops: these are the ones that have one of the two valves flat-shaped, like the lid of a pot. The outlet for the residue in the others[180] is on the side; for there is a duct for it to come out; for the *mêkôn*, as was said,[181] is in all of them a residue inside a membrane. The so-called egg does not have a duct in any of them, but is a swelling up of the flesh itself. And it is not on the same side as the intestine: instead, the egg is on the right, the intestine on the left. This is the way the outlet for the residue is in the others, but in the wild limpet, which some people call a "sea ear," the residue emerges under the shell; for the shell is perforated. In this animal, both the stomach coming after the mouth and the egg-like formations are visible. The way that all these parts are situated must be observed with the help of the *Dissections*.

The so-called hermit crab in a way has something in common with both the soft-shelled and the hard-shelled animals. For, in its nature, it is like the crayfish-like animals, and it is born by itself,[182] but by entering into a shell and living there it

180. Besides the wild limpet (529b14–17).
181. 529a11–12.
182. I.e., without a shell.

becomes like the soft-shelled animals, so that because of these things it seems to play a double game. Its shape, to put it simply, is like that of the spiders, except that the part below the head and the thorax is larger than those [of spiders]. It has two small horns, thin and red, and under them two long eyes, which do not go in or turn sideways, like those of the crabs, but stick straight out. Under these is the mouth, and around it a lot of hair-like growths. Following these are two feet divided in two, with which it draws things toward itself, then two others on either side, and a third small one. The entire part below the thorax is soft and, when opened up, is yellow inside. From the mouth **530^{a}1** there is a single duct leading as far as the stomach; the duct for the residue is not clear to perception. The feet and the thorax are hard, but less so than those of the crabs. They are not attached to the shells like the purpuras and the trumpet-shells, but easily separable. The ones in spiral shells are more elongated than those in nerite shells. But the one in the nerite shells is of another kind, though much the same as the others, but of its divided feet, the right one is small and the left one large, and makes progress more with it. An animal of this sort also occurs in shellfishes, where the attachment is much the same, and in others. This is the one people call a "hermit crab."

The nerite has a shell that is smooth, large, and round; its shape is much the same as that of the trumpet-shells, except that unlike those it has a *mêkôn* that is not black but red. It attaches firmly at the middle.

In good weather these animals detach themselves to feed, but when the wind blows the hermit crabs stay quiet by the rocks, while the nerites attach themselves like limpets. It is the same way with both the hemorrhoids[183] and all of this kind. They attach themselves to the rocks, when they turn back the operculum; for this seems to be a sort of lid; for where the bivalves have a second valve, the spiral-shelled animals have this other part. Their inner part is fleshy, and in it is the mouth. It is the same way in the hemorrhoids, the purpuras, and all animals of this sort.

All those that have the left foot larger [than the right] do not appear in spiral shells, but do appear in nerite shells. There are also some snail shells that have animals in them like the small crayfishes that occur in rivers; they differ from these in that the part they have inside the shell is soft. What the appearance of these is like must be observed with the help of the *Dissections*.

4.5
Urchins

The urchins have no fleshy part, which is a special affection of theirs; for they are all deprived of it, and have no flesh at all inside; but they all have the black entities.[184] There are many kinds of urchins, one of which is for eating; this is the one in which

183. Identity unknown.
184. Also 530^{b}13, 31, *PA* 680^{a}14. Their identity is unclear.

530ᵇ1 the so-called eggs are large and edible, alike in the large ones and in the small ones; for even at the outset, when they are still small, they have these. But there are two other kinds, that of the *spataggês* and that of the so-called *brussos*; both are deep-sea dwellers and rare. Further, there are the so-called mother urchins, which are the largest of all in size. In addition to these there is another kind, small in size, but with large hard spines, which occurs in the sea many fathoms deep, and which some people use to treat stranguries.[185] Around Torone there are white sea urchins whose shells, spines, and eggs are white, and whose length is greater than the others, while the spines are neither large nor strong but softer. The black entities arising from the mouth are more numerous and connect with the duct leading outside,[186] but do not connect with each other; the animal is, as it were, divided by these.

The edible urchins move the most and most often. A sign of this is that they always have something on their spines.[187]

All the urchins have eggs, although in some they are altogether small and inedible. One finds that the urchin's so-called head and mouth are down below, but that the outlet for the emission of residue is up above. The same thing occurs in all the spiral-shelled animals and the limpets; for their food comes from down below, so that the mouth is situated in relation to the food, while [the outlet for] the residue is up above by the back of the shell. The urchin also has five hollow teeth inside and, in the middle of them, a fleshy body in place of a tongue. Next to this is the esophagus, then the stomach, which is divided into five parts and is full of residue; all its folds connect in one at the outlet for the residue, where the shell is perforated. Under the stomach, in another membrane, are the so-called eggs, the same odd number in all of them (for they are five in quantity). Up above, the black entities are attached to the starting-point of the teeth; they are bitter and inedible. In many animals one finds a part of this sort or its analog—for example, the turtle, the toad, the frog, the spiral-shelled animals, and the
531ᵃ1 soft-bodied animals; but it differs in color, and in all animals of this sort is inedible either altogether or more or less so. With respect to its starting-point and end-point the body[188] of the urchin is continuous, although with respect to its surface it is not continuous, but, when it is without its surrounding skin, is like a lantern.[189] The urchin uses its spines as feet; for by leaning on these and moving it changes its place.

185. The eggs of sea urchins were used as diuretics to treat this condition, which is caused by irritation or blockage at the base of the bladder.
186. The outlet for the residue.
187. *PA* 681ᵃ7–9 explains.
188. Reading σῶμα for στόμα ("mouth [apparatus]").
189. I.e., when the spines and skins have been removed its yellow interior looks like a spherical lantern.

4.6
Sea Squirts

Among all these animals, the so-called sea squirts have the most extraordinary nature. For they alone have the body completely hidden inside the shell, and the shell is intermediate between skin and shell, which is why it cuts like hard leather. The animal attaches to the rocks by its shell-like part, and has two ducts at a distance from each other, altogether small, and not easy to see, by which it emits and takes in the water; for it has no visible residue in the way that, among the other shellfishes, some are like the urchin, while others have the so-called *mêkôn*. When opened up, one finds, first, a sinewy membrane around the shell-like part; and inside this is the flesh itself of the sea squirt, which is like that of none of the other hard-shelled animals; this flesh, however, is the same in all of them.[190] It is attached at two places on the side to the membrane and the flesh; and the place where it is attached is narrower on both sides at the places where it extends to the ducts going outside through the shell, where it emits and takes in the nourishment and the water, as if one duct were a mouth and the other an outlet for the residue. One of these ducts is thicker and the other thinner. Inside, there is a cavity on each side, separated by a small continuous entity;[191] in one of these the liquid appears. The animal has no other parts, either instrumental, perceptual, or—as is the case in the other [hard-shelled] animals, as was said previously[192]—for the emission of residues. Some sea squirts are yellow in color; others are red.

The anemone kind is also special; for it is attached to the rocks like some of the hard-shelled animals, though it is sometimes detached. It has no shell; its entire body is fleshy. It has perception: it seizes a hand approaching it and clings to it, just as the octopus does with its tentacles, in such a way that the flesh swells up. It has its mouth in the middle and lives using the rock as a shell. If a little fish strikes against it, it grasps it, just as it did with the hand. And if anything edible comes up against it, it eats it. One kind of the sea nettles[193] detaches itself; it eats urchins and scallops that strike against it. The sea nettle appears to have no residue at all, but to be in this respect like the plants.

There are two kinds of anemones, the smaller and more edible ones and the large hard ones, like the ones that occur around Chalcis. In winter their flesh is firm (which is why they are both hunted and edible), but in summer they are ruined; for they become watery, and if one touches them, they quickly break apart and cannot be detached whole; when they suffer from the heat, they tend to go into the rocks.

190. Reading πᾶσιν.
191. *PA* 681ª34.
192. 531ª14–16.
193. Or sea anemones (*PA* 681ª36).

The soft-bodied animals, the soft-shelled animals, and the hard-shelled animals, and all their externa and internal parts, have now been spoken about.

4.7
Insects

The insects must now be spoken about in the same way. This kind has many forms included in it; and, though some are kindred, they are not joined together by any common name—as, for example, in the case of the bee, the hornet, the wasp, and all insects of this sort; and, again, all those that have their wings in a wing case—for example, the cockchafer, the stag beetle, the blister beetle, and others of this sort.

There are three parts common to all insects: the head, the trunk containing the stomach, and a third part intermediate between the two, like the chest and the back in the other animals. This is a single part in most of them; but in the long many-footed ones, the intermediate parts are pretty much equal in number to the sections.

All insects when cut in two continue to live, except for the ones that are very cold or that, because of their minuteness, get cold quickly, since even the wasps continue to live when cut in two. When together with the middle part, both the head and the stomach continue to live, but without it the head does not continue to live. All those **532[a]1** that are long and many-footed live for a long time when cut, and the severed part moves toward either of the two extremities, for it moves in the direction of the cut or in that of the tail—for example, the so-called millipede.

All insects have eyes, but no other visible perceptual organ, though some insects have a sort of tongue (as do all the hard-shelled animals), with which they taste and draw in nourishment. This is soft in some of them, in others very strong—as it is in the purpuras. In the horsefly and gadfly too it is strong, as it is in most of the other insects; for in each of them that has no sting in the rear it is like a weapon. All those that do have it, except for a few sorts, do not have teeth; thus, it is by touching [the skin] with it that the flies draw blood and it is with it that the mosquitos prick.

Some insects also have a sting. Some have the sting inside themselves—for example, the bees and the wasps; others have it outside—for example, the scorpion. This is the only insect that has a long sting. It also has claws, as also does the scorpion-like insect found in books.[194]

The flying insects, in addition to the other parts, also have wings. Some have two wings, like the flies; some have four, like the bees. No insect with only two wings has a sting in the rear. Further, among the winged insects, some have their wings in a wing case, like the cockchafer. Some are without a wing case, like the bee. The flight of all of them is without help from the tail, and their wing does not have a quill or a

194. *Chelifer cancroides*. Also 557[b]8–12.

divide. Further, some of them have antennas in front of the eyes—for example, the butterflies and the horned beetles.

Among the jumping insects (*pêdêtika*), some have the back legs larger [than the front legs], others have rudder-like legs (*pêdalia*) that bend backward like the legs of the four-footed animals.[195]

All have the back parts different from the underneath parts, as is also the case with the other animals. The flesh of the body is neither shell-like, nor like that inside the hard-shelled animals, nor flesh-like, but intermediate. That is why they have neither spine nor bone, nor anything like sepium,[196] nor a shell around them; for the body **532^{b}1** itself, because of its hardness, preserves them, and needs no other support in addition. They do have a skin, but it is altogether fine-grained.

These, then, are the external parts of the insects and what they are like.

On the inside, immediately after the mouth, there is an intestine in most of them that is straight and simple up to the outlet [for the residue], though in a few it has a coil. No insect has any viscera or fat, any more than any other bloodless animal does. Some also have a stomach, and from this comes the rest of the intestine, whether simple or spiraling, as in the crickets.

The cicada is the only one among the animals of this sort and among the other animals that does not have a mouth but, like the insects that have a sting in the front, it has a tongue-like part that is large, coalescing, and undivided, with which it nourishes itself on dew alone; its stomach holds no residue. There are many forms of cicadas that differ in largeness and smallness and in that the ones called "chirpers" have a division under the diaphragm,[197] and a visible membrane, while the cicadellas do not have it.

There are some extraordinary animals in the sea, which, because of their rarity, it is not possible to put in a kind. For some experienced fishermen have been known to say that they have seen animals in the sea that are like pieces of wood, black, round, and of uniform thickness; others[198] that are like shields, red in color, with fins packed close together; and others that are like the sex organ of a man in appearance and size, except with two fins in place of the testicles, and that were once caught on the end of a line with many hooks.

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These, then, are the ways the parts of all the animals are, both the external ones and the internal ones, whether special to each kind or common.

195. *PA* 683^{a}32–36.
196. 524^{b}24–27.
197. Reading ὑπόζωμα.
198. Reading ἄλλοι.

4.8
Perceptual Modalities

The perceptual modalities must now be spoken about; for these are not present in the
30 same way in all the animals; instead, some have all of them, others fewer. They are at a maximum (for no other special one is evident beyond these) five in number: sight, hearing, smell, taste, and touch.

The human being, the live-bearing footed animals, and in addition to these the
533a1 blooded egg-laying ones, all visibly have all of these, except if a kind has been subject to a single deformation—for example, the mole. (For this animal does not have sight;
5 it has no visible eyes, but if the thick skin is removed from the head at the external region of the eyes, one finds eyes inside that have been destroyed, having all the same parts as true eyes; for they have the black part[199] and inside the black part the so-called eye-jelly, and the fatty part[200] surrounding it, but these are all smaller than in
10 visible eyes. But on the outside there is no sign of these because of the thickness of the skin, as if, in the process of coming to be, their nature had been deformed. For from the brain where it attaches to the marrow, there are two ducts, sinewy and strong, extending along the sockets of the eyes, and ending at the upper projecting teeth.)[201]

15 The other animals have perception of colors as well as sounds, and further, of odors and flavors. The fifth perceptual modality, called touch, all the other animals possess too.

In some animals the perceptual organs are very visible; this is especially the case
20 for the eyes. For the place of the eyes is distinctive, and so is that of the ears; for some have ears and some have visible ducts. It is the same way with smell; for some have nostrils, while others have olfactory ducts—for example, the bird kind. It is the same way too with the perceptual organ for taste, the tongue.

25 Among the aquatic animals, the ones called the fishes, though they have the perceptual organ for taste, the tongue, have it in an indistinct way; for it is bony and undetached. In some fishes the palate is fleshy (for example, among river fishes, the carp), so that, to
30 those who do not investigate it in an exact way, they seem to have a tongue there. But
533b1 that the fishes have perception of taste is evident; for many of them enjoy particular flavors and very readily take a bait of bonito or one of the fatty fishes, implying that they enjoy tasting and eating baits of this sort.

Of hearing or of smelling the fishes have no visible organ; for what might seem to be one in the region of the nostrils does not end in the brain; instead, some are blind alleys while others lead to the gills. But that they do hear and smell is evident; for they
5 visibly flee from loud noises, like those made by the oars of triremes, with the result

199. 491b21.
200. The white of the eye.
201. This sentence may be an interpolation of more general application, since the mole does not have such teeth.

that they are easily caught in their lairs; for a noise, even if small outside [the water], appears harsh, large, and oppressive to all those that hear under water.

This is in fact what happens in dolphin hunts; for when the hunters have encircled a gathering of them with their dugout canoes, they make a noise from them in the sea that causes the gathering to flee toward the land and run aground, and then they are captured while bewildered by the noise. And yet the dolphins have no visible organ of hearing at all.

Further, in fish hunts, those involved in the hunt take the utmost care not to make any noise with their oars or nets. But when they have observed a large gathering in a certain place, they drop their nets at the sort of place from which they judge that no sound either from oars or the onward movement of the fishing boat will reach the place where the fishes are; and they give order to all the sailors to keep as silent as possible until the gathering is surrounded.

Sometimes, when they wish the fish to gather together, they do precisely the same thing as in dolphin hunts; for they make noise with stones in order that, fearing it, the fish will run to the same spot, and in this way get enclosed in the nets. And before they have them closed in, as was said, they prevent the making of noise, but when they have them surrounded, they immediately give the order to shout and make noise; for when the fish hear the noise and uproar, they fall into the nets due to fear. Further, when fishermen see a large gathering of fish at a distance, feeding on the surface in calm waters and good weather, and wish to see what size and kind they are, if they sail up noiselessly, they can escape notice and catch them while they are still on the surface; but if someone happens to make a noise beforehand, the fish can be seen fleeing.

Further, in rivers there are certain small fishes that some call *kottoi*. Because they slip under rocks, some people hunt them by striking stones against the rocks; moving out in the wrong direction, they fall into [the nets], implying that they hear and are bewildered by the noise. **534ª1**

That the fishes hear, then, is evident from such things. Indeed, some people say that the fishes are the animals that have the sharpest hearing, on the basis of spending time around the sea and encountering many things of this sort. The fishes that have the sharpest hearing are the mullet, the bass, the saupe fish, the *chromis*, and other fishes of this sort. The others have less sharp hearing, which is why they spend more of their time at the bottom of the sea.

It is likewise with regard to smell. For most fish are unwilling to touch a bait that is not fresh; not all are caught with the same sort of bait, but with special ones; and they distinguish them by smell; for some are enticed by foul-smelling baits, as the saupe fish is by excrement. Further, many fishes spend their time in caves, and when fishermen wish to summon them out in a hunt, they smear the mouth of the cave all over with odorous pickles, and going toward those the fish come out quickly. The eel too is caught in this way; for the fishermen put down a pot for pickles and put in the mouth of the pot what is called a "strainer." And, in general, all fishes go quickly

toward the odor of greasy steam.[202] Indeed, fishermen par-broil[203] the flesh of the cuttlefishes to use as bait on account of its odor; for they come more toward that. And they say that they put broiled octopus into their wicker traps for no other reason than its odor of greasy steam.

Further, fishes that go in shoals with the currents, when water in which fish have been washed is thrown out, or foul bilgewater poured out, flee when they smell the odor of these. Also, they say that fishes quickly smell the odor of their own blood; they make this clear by fleeing to a great distance away whenever fish blood is around. And, in general, if one baits one's wicker trap with putrefying bait, the fish are unwilling to enter or even to go near it, while if one baits it with fresh bait that smells of greasy steam, they arrive immediately even from a great distance and enter the trap.

What has been said is most evident in the case of the dolphins; for these, as was said previously,[204] have no visible organ of hearing, yet are caught because they are bewildered by noise. They have no visible organ of smell either, yet their perception of odor is sharp.

That these animals[205] possess all of the perceptual modalities, then, is evident. The remining kinds of animals have been divided into four kinds, which encompass the majority of the animals: the soft-bodied animals, the soft-shelled animals, the hard-shelled animals, and further, the insects.

Among these, the soft-bodied animals, the soft-shelled animals, and the insects possess all of the perceptual modalities; for they have sight, smell, and taste. Indeed, the insects, both winged and wingless, perceive [odiferous] things that are far off—for example, the bees and the *knipes*[206] perceive honey. They perceive it at a great distance, because they recognize it by its odor. Also, many insects are killed by the smell of sulfur. Further, ants leave their ant nests when they are sprinkled with powdered oregano and sulfur, and most insects flee the fumes of burning hart's horn. But they especially flee fumigations with incense.

Further, the cuttlefishes, the octopuses, and the crayfishes can be caught with baits. The octopuses cling so tightly to the rocks that they cannot be pulled off, and stand firm even when being cut; but if one brings fleabane near them, they let go as soon as they smell it.

It is likewise too as regards taste; for the animals pursue distinct sorts of nourishment, and do not all enjoy the same flavors—for example, the bee does not settle on anything putrefying, but on what is sweet, while the mosquito does not settle on anything sweet but on what is acidic.

202. *Mete*. 387[b]6, 388[a]5.
203. *Mete*. 379[b]14.
204. 533[b]9–15.
205. The human being, the footed live-bearing animals, and the blooded egg-laying animals (532[b]29–533[a]3).
206. Small ants at *Sens*. 444[b]12.

As for the perceptual modality of touch, as was said previously,[207] it belongs to all the animals.

The hard-shelled animals have smell and taste, which is evident from their baits—for example, in the case of the purpura; for it is enticed by putrefying baits and goes toward this sort of bait because it has perception of it from a distance. That they also have perception of flavors is evident from the same things; for what an animal goes toward because it discerns its odor, it also enjoys the flavor of. Further, all animals that have a mouth enjoy or are pained by the touch of flavored things.

Where sight and hearing are concerned nothing is certain or very evident to perception. But the razor fishes, if someone makes a noise, seem to burrow in the sand, and to flee downward when they perceive the iron approaching[208] (for a small part of them sticks up, but the other part is, as it were, in its lair); and the scallops, if one offers one's finger, they open and close up as if seeing it. Also, those hunting nerites never go upwind of them when they are luring them toward their bait, and do not emit any sound but remain silent, on the supposition that they can smell and hear. If a sound is emitted, they say, the nerites flee. The weakest organ of smell among the hard-shelled animals that move by walking appears to be that of the urchins; among the immobile ones, that of the sea squirt and the barnacles.

4.9
Voices and Voiced Sounds

As regards the perceptual organs, then, these are the ways they are in all the animals; as regards the voice of animals, it is the following ways.

Voice and sound are distinct, and speech is a third thing. No other part except the larynx can make a voiced sound; that is why all animals that do not have a lung do not emit a voiced sound either.[209] Speech is the articulation of voiced sound by means of the tongue. Vowels are emitted by the voice and the larynx, consonants by the tongue and the lips; from these speech is composed. That is why all those animals that **$535^{b}1$** do not have a tongue, or one that is not detached, do not have speech. But it is possible to emit a sound with other parts too. The insects, for example, have neither voice nor speech, but they emit a sound with their internal breath, not with the external; for none of them breathes. But some of them buzz—for example, the bee and winged insects of this sort; while others are said to sing—for example, the cicadas. All these animals emit sounds with the membrane that is under the diaphragm in whichever of them is divided there—for example, a certain kind of cicada does so by means of a rubbing of the breath. And the flies, the bees, and all the others do so when flying by

207. $533^{a}17–18$.
208. The iron rod is let down into the burrow between the razor fish's valves and is drawn up when they close around its conical tip.
209. *PA* $664^{a}17$.

the lifting and lowering [of their wings]; for the sound is the rubbing of the internal breath. As for the crickets, they make sound by rubbing with their rudder-like legs.[210]

None of the soft-bodied animals makes either a voiced sound or a natural sound, nor does any of the soft-shelled animals. The fishes, though voiceless (for they have no lung, windpipe, or larynx), emit certain sounds and shrill cries, which is what is called their "voice"—for example, the *lura*, the *chromis* (for these fishes emit a sort of grunt), the *capros*[211] in the river Achelous, further, the *chalkis*, and the cuckoo fish; for the *chalkis* emits a sort of piping sound, and the cuckoo fish emits one that is much the same as the sound of the cuckoo, from which it also gets its name. All these animals emit what seems to be a voiced sound, some by the rubbing of their gills (for these places are spiny), others by means of internal parts around the stomach; for each of these has breath inside it, by rubbing and moving which they make the sounds. Some of the selachians seem to emit a shrill cry. But to say that these emit a voiced sound is not correct, though they do emit sounds. In fact, the scallop, when it spatially moves, leans on the water (which is called "flying"), and makes a whizzing sound; and so does the sea swallow; for these fishes fly aloft, without touching the sea; for they have fins that are broad and long. Just as when birds fly the sound made by their wings is not a voiced sound, so the sound made by these fishes is not one either.

The dolphin too emits a squeak and moans when it emerges [from the water] and
536ᵃ1 is in the air, but not in the same way as the cases mentioned; for this animal has a voice; for it has both a lung and a windpipe, but it has neither a detached tongue nor lips, so that it cannot make an articulated voiced sound.

Among the animals that have a tongue and a lung, those that are egg-laying and four-footed emit a voiced sound, but a weak one: in some cases, a piping sound, like the snakes; in others, a thin and weak voiced sound; and in others a small hissing sound, like the turtles. The frog has a special tongue; for the front part is attached as in the fishes (while in the other animals it is detached), but the part near the larynx is detached and folded up, and with this it emits its special voiced sound. It is the male frogs that make the croaking in water, when they call again and again the females for mating; for each of the animals has a special voiced sound for sexual intercourse—for example, goats, pigs, and sheep. The frog makes the croak by putting the lower jaw on a level with the surface of the water and distending the upper one. The jaws seem to become transparent from the distension, and the eyes appear like lamps; for mating occurs mostly at night.

The bird kind emits a voiced sound; and the ones that most have speech are those that have a broad tongue; also, those that have a thin tongue. In some cases, the male and the female emit the same voiced sound; in others, distinct ones. The small birds have many voices and are more talkative than the large ones; and it is especially around mating time that each of the birds is like this. Some emit voiced sounds

210. *PA* 683ᵃ32–36.

211. All three, along with cuckoo fish, are gurnards.

when fighting—for example, the quail; others before the fight, when challenging another—for example, the partridge; or when they have been victorious—for example, the chicken. In some cases, the males sing in the same way as the females—for example, both the male and the female nightingale do, except that the female stops when she is brooding or has chicks; in some cases, it is rather the males that sing—for example, the chickens and the quails—while the females do not sing.

The live-bearing four-footed animals each emit a distinct voiced sound, but none of them has speech, which is special to the human being; for all the ones that have **536^b1** speech also have a voice, but those that have a voice do not all have speech. All those who are deaf from birth are also mute: they emit voiced sounds, but no speech at all. Children, just as they do not have control of the other parts, also do not at first have control of the tongue, which is incomplete and detaches itself later on, so that they mostly speak inarticulately and lisp.

The voices and the sorts of speech differ in accord with the places. Voiced sound is distinguished mostly by high pitch and low pitch, but does not differ in form among animals of the same kind. In the case of articulated voiced sounds, on the other hand, that one might describe as being like speech, they differ both in distinct [kinds of] animals and in animals of the same kind in accord with the place—for example, among the partridges, some cackle, while others emit a shrill cry. And some small birds do not emit the same voiced sound in singing as their parents, if they are reared away from home and have heard other birds singing. A female nightingale has been observed teaching her chick to sing, implying that the speech and the voiced sound are not the same thing by nature, but that the latter admits of being molded. Human beings emit the same voiced sound, but their speech is not the same.

The elephant emits a voiced sound which, when not with its trunk, but with the mouth alone, is wind-like, and of the sort that a human being makes when breathing out and groaning, but when with its trunk, it is like the sound of a harsh trumpet.

4.10
Sleeping and Waking

As regards the sleeping and waking of the animals, all those that are footed and blooded sleep and wake, as is made evident by perception. For all animals that have eyelids go to sleep by closing them. Further, it appears that not only do human beings dream, but also horses, dogs, cows, and further, sheep, goats, and the entire live-bearing four-footed kind; dogs make this clear by barking [while asleep]. In the case of the egg-laying animals, on the other hand, this is not clear, but that they sleep is evident.

It is the same way with the aquatic animals—for example, the fishes, the soft-bodied animals, and the soft-shelled animals (the crayfishes and animals of this sort). All these **537^a1** animals sleep little, but it is evident that they do sleep. A sign of this is obtained not from their eyes (for none of these has eyelids), but from their keeping still.

For the fishes are caught [while asleep], so that, if not [kept awake] because of lice and so-called fleas, they are easily caught by hand. But as things stand, if they linger, these parasites fall upon them at night and eat them, since they are very numerous. They come about in the depths of the sea, and in such large numbers that eat even the bait, provided it is fish, if it lingers on the bottom; indeed, fishermen often draw up a sort of ball of them clinging to the bait.

But a better proof that fishes sleep comes from the following; for often it is possible to fall upon fishes unawares in such a way that one can catch them by hand or by striking them a blow; for during this time they stay very still, and do not move, except for a slight movement of the tail. It is also clear they sleep from their spatial movements if anything moves when they are at rest; for they move as if from sleep. Further, in torchlight fishing, they are caught because they are sleeping. Often too the tuna-watchers cast a net around them because they are sleeping; this is clear from the fact that they stay very still and show their white undersides while being caught. Fishes sleep more soundly at night than during the day, so much so that, when the net is cast, they remain stationary. Mostly they sleep close to the land, or to the sand, or to some stone on the bottom, or after hiding themselves under a rock or sandbank. Flat fishes sleep in the sand; they are recognized by the outline shape the sand takes and are caught by being stuck with tridents. The bass, the gilthead, the mullet, and fishes of this sort are often caught with a trident during the day because they are asleep; otherwise, it seems that none of the fishes of this sort could be caught with a trident. The selachians sometimes sleep so soundly that they can be caught by hand.
537b1 The dolphin, the whale, and all that have a pipe[212] sleep with the pipe above the sea, and through it they breathe while quietly moving their fins; indeed, some people have actually heard a dolphin snoring.

Soft-bodied animals sleep in the same way as the fishes; likewise the soft-shelled animals.

That insects too are among the animals that sleep is evident from the following sorts of signs; for they remain noticeably still and do not move. This is most clear in the case of the bees; for they stay still and stop buzzing at night. But this is also clear especially in the case of the sorts of insects that are close at hand; for not only do they stay still at night because they do not see sharply (for all hard-eyed animals see indistinctly), but also when they are near the light from lamps it is evident that they stay no less still.

Of all the animals, it is the human being that dreams the most. Among the young, and those who are still small children, dreaming does not occur at all, but starts in most cases around the age of four or five years. But cases have been observed of men and women who have never had a dream at all.[213] In people of this sort, however, if

212. I.e., a blowhole.
213. Cf. *Insomn.* 462a31–b11.

they happened to have a dream in older age, after it, a change occurs having to do with the body, in some cases leading to death, in others to a bad state of health.

As regards perception and sleeping and waking, then, these are the ways they are.

4.11
Sex

The male and the female exist in the case of some animals, not in the case of others, but by way of a sort of similarity they are said to bear offspring and be pregnant.[214] In the stationary animals, there is no male and female, nor, in general, in the hard-shelled animals. In the soft-bodied animals and the soft-shelled animals there is a female and a male, and in all the terrestrial animals, both two-footed and four-footed, and in all those that as a result of copulation give birth to a live animal, whether an egg or a larva. In the other kinds of animals, there either simply is a male or female or there simply is not—for example, in all of the four-footed animals there is the male, on the one hand, and the female, on the other, while in the hard-shelled animals there is not; instead, just as in the plants some are fertile and some are infertile, it is the same in these animals. **538^{a}1**

In the insects and the fishes there are some wholly without this difference between the two sexes—for example, the eel[215] has neither a male nor a female and generates nothing from itself; those who say that some eels are at times seen that have hair-like and worm-like things attached speak unreflectively, without additionally observing where they have these. For no animal of this sort is ever live-bearing unless it is previously egg-laying; and none has been seen with an egg. Besides, all the live-bearing animals have their offspring attached in the womb, not in the abdomen; for otherwise it would be concocted like the nourishment. Some say that the difference between the female and the male eel lies in the male having a larger and longer head, and the female a smaller and more snub-nosed one; but the difference they speak of is not that of female and male but that of kind.

There are certain fishes that are called *epitragias*: the carp and the *balagros* are river fishes of this sort. Fishes of this sort have neither egg nor seminal fluid; those among them that are firm and fat, have a small intestine, and are regarded as the best fishes.

Further, just as in the hard-shelled animals and plants there is what bears and what generates, but not what mates, so it is with fishes of the *psêtta*[216] kind and that of the erythrinus and the channa; for all fishes of this sort are seen to have eggs.

214. *GA* $715^{b}16$–21.
215. 6.16.
216. A flat fish, perhaps the turbot. Also $543^{a}2$, $620^{b}30$.

In all the blooded terrestrial animals that are not egg-laying, the males are mostly larger and longer-lived than the females, except for the mule, where the females are longer-lived and larger. But in the egg-laying and larvae-generating animals, as in the fishes and the insects, the female is larger than the male—for example, the snakes, the venom-spiders, the geckos, and the frogs. And in the case of the fishes it is the same way—for example, the small selachian fishes, most of the fishes that live in herds, and all the rock fishes. That the female fishes live
538ᵇ1 longer than the males is clear from the fact that more older females are caught than males.

In all animals the upper and front parts of the males are better, stronger, and better equipped, while in the female it is the ones that may be called the "hind parts" and "under parts." It is the same way in the case of the human being and in that of the other live-bearing terrestrial animals. The female also has less strong sinews and articulations, and is more fine-haired, in those that have hair; in those that do not have hair, its analog is thinner. And the females are more flabby-fleshed than the males and more knock-kneed, their shanks are thinner, and their feet more arched, in those animals that have these parts.

As regards the voice, all the females have weaker and more high-pitched ones, except the cow, in those that have a voice; for the female cows emit a lower-pitched voiced sound than the males.

As for the parts that by nature belong for strength, such as teeth, tusks, horns, spurs, and all parts of this sort, in some kinds of animals the male has them and the female does not have them—for example, the female deer has no horns; and, among some birds that have spurs, the females have no spurs at all; similarly, the female pigs do not have tusks. In some other cases, though these parts belong to both sexes, they are better and more developed in the males—for example, the horns of bulls are stronger than those of the female cows.

BOOK 5

5.1
Generation of Animals

All the parts, then, that all the animals have, both internal and external, and further, the perceptual parts, voice, and sleep, and what the males and females are like—all these were spoken about previously. It remains to discuss their modes of generation,
539ª1 taking first things first.

These modes are many and of great variety, and though in a way they are unalike, in another sort of way they resemble one another. But since the kinds [of animals] were distinguished previously, we must also now try to make this theoretical investigation

in the same way—except that then[217] we made an investigation of the parts of the human being our starting-point, but now we must speak of the human being last of all, because it involves the most study.

We must start first with the hard-shelled animals, and after that speak in order about the soft-shelled animals and the others in the same way: the soft-bodied animals, the insects, and after that the fish kind, both the live-bearing and the egg-laying of these, then the birds. After that, we must speak about the footed animals, both all the egg-laying and all the live-bearing ones. Some of the four-footed animals are live-bearing, but among the two-footed animals, the human being is the only one.

There is a feature common to the animals, just as also to the plants; for while some plants come to be from seed provided by other plants, others come to be spontaneously, from some sort of composition from a seed-like starting-point; and among these, some get their nourishment from earth, while others come to be on other plants, as was said in the theoretical investigation concerning plants.[218] So too among the animals, some come to be from animals of the same kind as themselves in shape, while others do so spontaneously and not from animals of the same kind as themselves; and among these, some come to be from putrefying earth and plants, as many insects do, while others come to be inside animals themselves from the residues in their parts.

Among the ones where generation is from animals of the same kind, in all of those in which there is the female and the male, generation is from copulation. In the fish kind, however, there are some that come to be that are neither male nor female, but are the same in kind as the other fishes, though distinct in species,[219] while others are altogether special cases.[220] And there are some where there are females but not males; from these the equivalent of wind-eggs in the birds come to be. In the case of the birds, all these eggs are infertile (for their nature is capable of generation only up to the egg stage), unless there is some other mode of sexual intercourse with the males.[221] This will be made clear with greater exactness later on.[222] With certain **$539^{b}1$** fishes, however, when they have eggs that come to be spontaneously, it happens that living animals come to be from them, except that some do it by themselves, others not without the male. As for the mode of generation, it will again be made evident in what follows;[223] for it is pretty much the same as in the case of the birds.

All the ones that come to be spontaneously, then, either in animals, in earth, in plants, or in the parts of these, and that have the male and the female, when these copulate, they generate something that is never the same [in kind] as either of the

217. $491^{a}19–23$.
218. Not extant.
219. E.g., a certain kind of mullet ($569^{a}17–23$).
220. E.g., eels ($570^{a}3–7$). Also *GA* $741^{a}32–^{b}2$.
221. *GA* $730^{a}4–9$.
222. $541^{a}26–31$, $559^{b}21–560^{a}20$.
223. 6.3.

progenitors, but is incomplete—for example, from the mating of lice come what are called "nits," from flies larvae, and from fleas egg-like larvae; and from these neither the progenitor [kind] nor any other [kind] of animal comes to be, but only the sorts of things mentioned.

First, then, it is necessary to speak about mating, in all animals that mate, then, after that, about the other modes in order, both the particular ones and those that are common.

5.2
The Live-Bearing Four-Footed Animals; the Birds

Mating occurs in those animals in which the male and the female exist, but the ways of mating are neither the same in all cases nor do they occur in a similar way. For among the blooded animals that are live-bearing and terrestrial, all the males have instruments for the act of generation, but they do not all have sex in the same way. The animals that urinate backward have intercourse rump to rump—for example, the lion, the hare, and the lynx, though the female hare often first mounts the male.

In most of the other animals the mode is the same; for the majority of the four-footed animals engage in copulation in the way possible, with the male mounting the female, and in the entire bird kind this is the way—and the only way—it occurs. But there are differences even among the birds; for in some cases the female crouches on the ground for the male to mount—for example, the bustards and the chickens; in others, the females do not crouch down—for example, the cranes; for in these the male mates by leaping upon the female, and the intercourse is quick, as in the case of the sparrows.

Among the four-footed animals, the bears lie prone, engaging in precisely the
540ᵃ1 same mode of mating as the others that do so on their feet, with the underneath parts of the males against the back of the females. Hedgehogs, on the other hand, mate standing upright, with their underneath parts against each other.

Among the large-sized live-bearing animals, the females only rarely submit to the male deer, or the cows to the bulls, because of the tension in the latter's sex organ; it is rather when withdrawing that the females take in the semen. Indeed, in the case of the deer this has been seen to occur, at any rate, among tame ones. The wolf mates and is mated in the same way as the dog. Cats do not have intercourse back to back; instead, the male stands upright and the female puts herself underneath him. For female cats are by nature eager for sexual intercourse, entice the males to acts of mating, and scream during intercourse. Camels mate with the females sitting, the male mates straddling her, not rump to rump, but like the other four-footed animals; and they pass the whole day with one mating and the other being mated. They retire to a deserted place when they engage in mating, and it is not safe for anyone to approach them but their keeper. The camel's sex organ is so sinewy that bow-strings are actually

made from it. Elephants mate in deserted places, mostly near the rivers and where they usually spend their time; the female crouches with her legs apart and the male mounts her and mates. The seal mates like the animals that urinate backward, and keep together for a long time during mating, as the dogs do. The males also have a large sex organ.

5.3
The Egg-Laying Four-Footed Animals

The four-footed egg-laying terrestrial animals engage in the same mode of mating. For some mount like the live-bearing ones—for example, the land turtle and the sea turtle. {. . .}[224] They have a part in which the ducts join together, and with it they have sex during mating—for example, the toads, the frogs, and all of this kind.

5.4
The Footless Animals

The elongated footless animals, like the snakes and the muraena,[225] intertwine with underneath parts next to underneath parts. The snakes intertwine so very tightly, **$540^{b}1$** indeed, that they seem to form the entire body of a single snake with two heads. The mode is also the same in the lizard kind; for they engage in mating by intertwining.

5.5
The Fishes

All the fishes, except for the broad selachians, engage in mating lying side by side with underneath parts next to underneath parts. The broad ones that have a tail, like the ray, the stingray, and fishes of this sort, do so not only side by side, but also by the mounting of the males on the females, underneath parts to back parts, in all those cases in which the tail's great thickness does not impede it. The angel fishes, and those of this sort that have a large tail, mate only by rubbing underneath parts against underneath parts. There are people, though, who say that they have seen some of the selachians have intercourse back to back, like the dogs.

In all the selachian-like fishes the female is larger than the male; and in pretty much all the other fishes too the female is larger than the male. The selachians include

224. There seems to be a lacuna in the text at this point.
225. Reading μύραινα.

the ones mentioned, the ox fish,[226] the *lamia*,[227] the eagle ray, the torpedo fish, the fishing frog, and all of the shark-like fishes. The selachians have all been observed by many people engaged in these modes of mating; for in all the live-bearing animals copulation lasts longer than in the egg-laying ones.

In dolphins and cetaceans the mode is the same; for they mate with the male side by side with the female, and the time involved is neither short nor very long.

In some selachian fishes the male differs from the female in having two appendages near the outlet for the residue, while the females do not have these, as in the shark-like fishes; for what was said applies to all such fishes.

Neither the fishes nor any other of the footless animals have any testicles at all, but male snakes and male fishes have two ducts that become filled with seminal fluid in mating season, and all emit a milk-like liquid. These ducts join together into a single duct, as in the birds; for the birds have their testicles inside, as do all the egg-laying **541^{a}1** footed animals. This duct elongates and extends itself into the receptive part of the female.

In the live-bearing footed animals, the same duct serves for the seed and for the liquid residue on the outside, but inside it is a distinct duct, as was said previously in discussing the difference in the parts.[228] In those that do not have a bladder, the same duct serves also for the dry residue on the outside; but inside they are near each other. These are the same way in the females of these animals as in the males; for they do not have a bladder, except for the turtle, where the female has one duct, and yet it has a bladder. But turtles are egg-laying animals.

The mating of the egg-laying fishes is less open to observation; that is why most people[229] suppose that the females become pregnant after gulping down the seminal fluid of the males. For this is often seen to occur; for in the mating season the females do this as they follow the males, and they strike them under the abdomen with their mouths, making the emission of the fluid faster and more plentiful. At the time of giving birth, on the other hand, it is the males who follow the females, and gulp down the eggs when they emerge. And it is from the ones left over that the fish come to be. (In Phoenicia, in fact, one is used to hunt the other; for the male mullets attract the females which are netted when they gather together, and the females attract the males.) Because this is often seen, it produced the belief that the activity in question is mating. Yet the four-footed animals do something similar; for in mating season both males and females produce secretions and smell at each other's sex organs. When female partridges stand downwind from the males, they become impregnated; they often do so too on hearing the voice of the male, if they happen to be in heat, and when they are being flown over, from the male breathing down on them. Both the

226. The horned ray.
227. A large shark.
228. $497^{a}24$–28.
229. E.g., Herodotus 2.93.

male and the female keep their mouth wide open and stick their tongue out when engaged in mating.[230]

But the true intercourse of the egg-laying fishes is seldom seen because of the rapidity with which they ejaculate after coming side to side, but even in their case mating has been seen to occur in the way described.

5.6
The Soft-Bodied Animals

541^b1 The soft-bodied animals, such as the octopuses, the cuttlefishes, and the calamaries, all have sex in the same way; for they intertwine at the mouth, fitting tentacles to tentacles. The octopus, when it has rested its so-called head on the bottom of the sea and spread out its tentacles, the other fits itself into the spread-out tentacles, and they make their suckers conjoin with each other.

Some people say that the male too has a sort of sex organ in one of his tentacles, the one in which the two largest suckers are, that this part is sinewy and, up to the middle, is entirely attached to the tentacle, and that with it he enters the nostril[231] of the female.

The cuttlefishes and the calamaries swim around intertwined, with their mouths and tentacles fitted to and facing each other, swimming in contrary directions; and they fit the so-called nostril of one to the nostril of the other. The swimming is effected by one swimming backward and the other in the direction of the mouth. The female lays eggs through the so-called pipe,[232] with which some people say they actually mate.

5.7
The Soft-Shelled Animals

The soft-shelled animals—for example, the crayfishes, the lobsters, the carids, and animals of this sort—mate like the animals that urinate backward, when one turns up its tail and the other puts its tail on it. They mate at the start of spring, near the shore (for the mating of all animals of this sort has often been observed), but sometimes it occurs when the figs start to ripen. The lobsters and the carids mate in the same way.

The crabs copulate at their front parts, uniting their layered opercula to each other. First, the smaller crab mounts the larger at the rear; when it has done this, the larger one turns on its side. The female differs in no respect from the male, except that the operculum is larger, stands out more, and is more thickly covered [with hair]; in it she lays eggs and through it the residue comes out. No part of either is inserted into the other.

230. $560^b13–16$.
231. Called a "funnel" at 524^a10, *GA* 720^b32.
232. I.e., the nostril.

5.8
Mating Seasons: The Insects

Insects copulate at the rear, and the smaller one—this is the male—mounts the larger.
542a1 The female inserts her duct from below into the male above, not the male into the female, as in the other animals. And in some cases it is evident that this part is disproportionately large compared to the body as a whole, even when the females are very small, while in others it is less. This is evident if one separates mating flies. They are detached from one another only with difficulty; for the copulation of animals of this sort lasts a long time. This is clear in the insects close at hand—for example, the flies and the blister beetles. They all copulate in this way, the flies, the blister beetles, the *sphondulê*, the venom-spiders, and any others of this sort that mate. The venom-spiders—the ones that weave webs—engage in mating in the following way: when the female at the middle of the web pulls on the suspending strands, the male in turn gives a counterpull; having done this many times, they meet and copulate rump to rump; for because of the roundness of their stomachs this is the mode of copulation that fits them.

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These are the ways in which the mating of the animals occurs. As for the seasons and ages for the mating, these are determined for each of the animals.

The nature of most of them tends to have them engage in sexual intercourse around the same time, when it is changing from winter to summer. And this is the season of spring, which is when most animals—flying, walking, and swimming—have an impulse to copulate. Some mate and give birth both in fall and winter—for example, some kinds of aquatic animals and of birds. But it is most of all the human being that does so in every season, and also many of the animals that live among human beings (because of shelter and good nourishment) and whose pregnancies are short (like the pig and the dog), and those birds that give birth frequently. Many of the animals also have in view the rearing of their offspring and engage in copulation in the fitting season. In the human beings, the male feels the desire for intercourse more in winter, the female more in summer.

542b1 The bird kind, as was said, most mate and give birth in spring and at the start of summer, except for the halcyon.[233] The halcyon lays eggs around the time of the winter solstice. That is why, when good weather occurs at the solstice, the seven days preceding the solstice and the seven days following the solstice are called "halcyon days," as Simonides says in his poem:

> As when in the winter month Zeus admonishes fourteen days
> And mortals call it the holy season that forgets the winds,
> The season when the dappled halcyon nurtures her offspring.[234]

233. 9.14.
234. Fr. 508 Page.

And these days are calm when it so happens that south winds blow at the solstice, when north ones have occurred at the time of the Pleiades.[235] It is said that the halcyon builds its nest in seven days, and in the remaining seven days lays eggs and raises the chicks. In the places around us there are not always halcyon days at the solstice, but in the Sicilian sea there pretty much always are. The halcyon lays around five eggs.

5.9
Mating Seasons: The Birds, Fishes, and Others

The *aithuia*[236] and the gulls lay their eggs on rocks near the sea, two or three in number; but while the gull lays eggs in summer, the *aithuia* lays them at the start of spring, immediately after the solstice, and it broods just like the other birds. But neither of these two birds hides itself.

The rarest of all birds to see is the halcyon; for it is pretty much seen only at the setting of the Pleiades and the solstice. When ships are lying at anchor, it flies around a ship and then disappears immediately, which is why Stesichorus[237] recalls this mode of behavior of the bird.

The nightingale also lays eggs at the start of summer, and lays five or six eggs. It goes into hiding from fall until spring.

As for the insects, the ones that do not go into hiding (for example, the flies and the ants) mate and give birth in winter too, when the weather is good and the south wind blows.

Most wild beasts, the ones that do not superfetate,[238] give birth once a year—for example, the hare.

In the same way, most of the fishes lay eggs once a year—for example, the shoal **543^{a}1** fishes (the ones called "shoal fishes" are the ones caught in nets), the tuna, the young tuna, the mullet, the *chalkis*, the coly-mackerel, the *chromis*, the *psêtta*,[239] and fishes of this sort, except the bass. It alone lays eggs twice, and the second offspring are weaker [than the first]. The *trichias*[240] and the rock fishes also lay eggs twice a year; the red mullet alone lays eggs three times. This is proved from its seed; for the seed appears three times a year in certain places. The scorpion fish lays eggs twice. The sargus too lays eggs twice a year, in spring and fall. The saupe fish lays eggs once, in fall. The female tuna lays eggs once, but because some fish lay eggs early and others late, it seems to lay eggs twice. The first giving birth is in the month of Poseideon[241] before

235. In early November if the reference is to the morning setting of the Pleiades, as at 542^{b}23.
236. Perhaps the shearwater.
237. No extent passage mentions the halcyon.
238. *GA* 4.5.
239. 538^{a}20.
240. 569^{b}25.
241. Mid-November–mid-December.

the solstice, the second in spring. The male tuna differs from the female in not having under the abdomen the fin that is called the *aphareus*.[242]

5.10
Mating Seasons: The Fishes (1)

Among the selachians, only the angel fish lays eggs twice; for it lays them once at the start of fall and a second time at the setting of the Pleiades, but is in a more thriving condition in fall. From a single giving birth around seven or eight offspring come to be. Some of the sharks—for example, the starry shark[243]—seem to lay eggs twice a month;[244] this happens because not all eggs reach completion at the same time.

Some fishes lay eggs in any season—for example, the muraena. This fish lays a great many eggs, and from being small the offspring grow rapidly, as with the offspring of *hippouros*[245]—for these too from being very small rapidly become large—except that the muraena lays eggs in all seasons, the *hippouros* in spring. The *smuros* differs from the muraena; for the muraena is variegated and weaker, while the *smuros* is unicolored and strong; its color is like that of the pine tree, and it has teeth outside as well as inside. People say, as in other cases, that one is the male and the other the female. These fishes come out onto dry land and are often caught.

Pretty much all the fishes grow rapidly, and, among the small fishes, not least is
543b1 the crowfish;[246] this fish lays eggs near the shore in thick seaweed. The sea perch too, from being small, quickly becomes large. The young tuna and the tuna lay eggs in the Black Sea, but nowhere else. The mullets, the giltheads, and the bass mostly do so where rivers flow into the sea. The *orkus*, the scorpion fishes, and many other kinds of fishes do so in the deep sea.

5.11
Mating Seasons: The Fishes (2)

Most fishes lay eggs in the three months of Munichion, Thargelion, and Scirrophorion.[247] A few do so in fall—for example, the saupe fish, the sargus, and other fishes of this sort, which lay eggs a little before the fall equinox, as well as the torpedo fish and the angel fish. Some even lay eggs in winter and summer, as was said previously[248]—for

242. No such fin, or other mark of sexual difference, exists.
243. The nursehound, *Squalus stellaris*.
244. 566a15–23.
245. Perhaps the dolphin.
246. *Chromis castanea.*
247. Mid-March–mid-June.
248. Perhaps 543a4–11.

example, in winter, the bass, the mullet, and the pipefish; and in summer, in the month of Hecatombaion,[249] around the summer solstice, the female tuna, which lays a sort of bag containing many small eggs. The fishes also that go in shoals with the currents lay eggs in summer.

Among the mullets, the *chellôn* starts to become pregnant in the month of Poseideon,[250] as do the sargus, the so-called *smuxôn*, and the gray mullet; they are pregnant for thirty days. Some of the mullets do not come about from copulation, but grow from mud and sand.

For the most part, then, most of the fishes become pregnant in spring; nonetheless, as was said, some do so in summer, in fall, and in winter; but it does not occur in the same way in all of them, either unconditionally or as regards each kind, as it does with most of those that become pregnant in spring; nor are there as many fetuses in a pregnancy as in the other seasons.

In general, then, it must not escape notice that, just as in the case of the plants and the four-footed animals, the seasons make a lot of difference not only as regards the rest of the good condition of the body, but also as regards the frequency of mating and generation of offspring; so too, in the case of the fishes, places themselves make a lot of difference not only as regards size and their good nourishment, but also as regards giving birth and mating, the same ones giving birth more often in one place and less often in another.

5.12
Mating Seasons: The Soft-Bodied Animals and Hard-Shelled Animals

The soft-bodied animals also lay eggs in spring and, among the marine ones, the first **544^{a}1**
to do so is the cuttlefish. It lays eggs at all times of the day, and its pregnancy is fifteen days. When the female has laid the eggs, the male follows along behind, emits his seminal fluid on them, and they firm up. The cuttlefishes go about in pairs; the male is more variegated than the female and blacker on the back.

The octopus mates in winter and lays eggs in spring, at this time it hides for around two months. It lays an egg that is like a vine-tendril, and similar to the fruit of the white poplar. This animal is prolific; for from what is laid a countless number of offspring comes to be. The male differs from the female in having a more elongated head and what fishermen call a white "sex organ" on one of its tentacles. The female broods having laid them; that is why they become of very poor quality;[251] for they do not feed during this period.

The purpuras too are born around spring, and the trumpet-shells when winter is ending. And, in general, the hard-shelled animals are seen to have their so-called eggs

249. Mid-June–mid-July.
250. Mid-November–mid-December.
251. Either in condition or for eating purposes.

in spring and in fall, except the edible sea urchin, which though it has eggs most of all at these times, nonetheless always has some, especially when there are full moons and warm days, except in the straits of Pyrrha. There they are best in winter; for, though they are small, they are full of eggs.

Snails too are all seen to become pregnant during this season.[252]

5.13
Mating Seasons: The Birds

Among the birds, the wild ones, as was said,[253] mostly mate and lay eggs once a year, though the swallow and the blackbird lay eggs twice. The first offspring of the blackbird, though, are destroyed by the winter (for it is the earliest of all birds to lay eggs), but it rears the second offspring to the end.

Tame birds, or birds that can be tamed, lay eggs frequently—for example, the pigeons do so all summer, and so does the chicken kind; for the male chickens mate and the females mate and lay eggs at all times, except in the days around the winter solstice.

544b1 There are many kinds of pigeon-like birds; for the common pigeon and the rock pigeon are distinct. The rock pigeon is smaller; the common pigeon is more easily tamed; the rock pigeon is black, small, red-footed, and rough-footed, which is why nobody rears it. The largest bird of this sort is the ring dove; second, the wine-colored pigeon, which is a little bigger than the common pigeon; and the smallest of these birds is the turtledove. The pigeons lay eggs and rear offspring in all seasons, if they have a warm place and the provisions they need; otherwise, in summer only. The offspring of spring and fall are best; those of summer and the hot season are worst.

5.14
The Ages of Mating

The animals also differ with respect to the age for mating. First, in most of them the excretion of seed does not start at the same time as the capacity to generate offspring, which comes later; for the first seed of the young in all the animals is infertile, or if it is fertile the offspring are weaker and smaller. This is most clear in the case of the human beings and the live-bearing four-footed animals, and in the case of the birds; for the offspring of the former are smaller, and of the latter the eggs are.

252. Spring and fall.
253. 542b2–4.

The age for animals to mate with each other occurs in most kinds at pretty much the same time, unless it occurs earlier because of some monstrosity-producing affection or damage to the nature.

In the human beings, it is a change in the voice and in the sex organs, not only in size but in form, that appears as a sign of this stage, and similarly in the case of the breasts, and especially by the growth of pubic hair. The human being starts to bear seed around the age of fourteen and becomes capable of generating at around twenty-one. In the other animals the pubic region do not become hairy (for some animals do not have hair at all, others do not have it on their underneath parts, or have less than on their back parts), but that the voice changes in some of them is seen clearly. In others, it is in other parts of the body that signs appear of the start of already having seed and of fertility.

Generally speaking, in most animals the female has the higher-pitched voice, and younger animals than older ones; thus the male deer emit a lower-pitched cry than the female. The males emit voiced sounds when it is mating season, the female when **545^{a}1** they are frightened. The voiced sound of the female is short, that of the male is prolonged. The voiced sound of the dogs becomes lower pitched as they get older. The voices of the horses also differ; for the females from the outset have a thin, small voice, while the male, though it has a small one, yet it is louder and lower-pitched than the female's, at any rate; and it gets louder as time goes on. When they are two years old, and mating starts, the voice of the male is louder and lower-pitched, and that of the female is louder and clearer than before, up until the age of twenty, for the most part. After this time, both the males and the females emit weaker voiced sounds.

For the most part, then, as we said, the voice of the males and that of the females differ in that the males emit a lower-pitched voiced sound than the females, in all those cases where there is prolongation of the voiced sound. But this is not so in all animals, indeed in some it is the contrary—for example, in the cows; for in their case the female emits a deeper voiced sound than the male, and the calves than the adults. That is also why the voices of castrated ones change in the contrary way; for the castrated ones change into the female condition.

The times of mating for the animals with respect to age are as follows. The sheep and the goat mate and conceive at the age of one year, especially the goat, and the males mate at the same age. But the offspring of the males differ in these cases from those of the others; for the males become better in the second year, when they are older. The pig is mated and mates first at eight months; the female gives birth at one year (for this corresponds to the period of pregnancy). The male can generate at eight months, but the offspring are poor until he is a year old. But the ages, as was said, are not the same everywhere; for in some places the pigs are mated and mate at four months, with the result that they can generate and rear [the offspring] at six months; **545^{b}1** in other places, the boars start to mate at ten months, and are good up to three years. The dogs, for the most part, are mated and mate at one year, but sometimes even at eight months; this happens more often in the case of the males than the females.

The female is pregnant for sixty-one, sixty-two, or, at most, sixty-three days; but the offspring are never carried for less than sixty days; but if they are, and are born, they are never reared to the end. After giving birth, the female is ready to be mated again in the sixth month, but not before.

The horse starts mating and being mated—so as to generate offspring—at two years, although the offspring generated at these times are smaller and weaker. For the most part, the horses mate and are mated at three years. This gives them an ever better capacity to generate offspring up to the age of twenty years. The male horse mates up to the age of thirty-three years, the female is mated up to the age of forty years, so that mating occurs pretty much throughout life; for, for the most part, the male lives to around thirty-five, the female to beyond forty, though a case has been observed of a horse that lived to seventy-five.

The ass mates and is mated at thirty months; but, for the most part, they do not generate until they are three or three and a half years old. But, again, a case has been observed of a one-year-old ass conceiving and rearing an offspring. Also a one-year-old cow has been observed to bear and rear an offspring; but it grew [only] to the size that might be expected [for a non-adult] and no further.

These are the ways, then, that the starting-points of generation are for the animals.

As regards human beings, the male can generate offspring up to the age of seventy years at most, a woman up to fifty years. But this is rare; for few people at these ages generate offspring. For the most part, the defining mark for males is sixty-five, and for women forty-five.

The sheep gives birth for up to eight years and, if well treated, up to eleven. It both mates and is mated pretty much throughout life. The goats, when they are fat, are less fertile (hence vines that bear no fruit are called "goatish");[254] but if they are made thin, they are able to generate offspring when they mate. The rams mate with the oldest females first, and do not pursue the young ones. The young ones, as was said previously,[255] give birth to smaller offspring than those of the older ones.

The boar is good to mate up to three years, but the offspring of older ones are worse; for he no longer improves nor does his strength. The boar usually mates when he has eaten his fill and has not just mounted another female; otherwise, the mating is of shorter duration and the offspring are smaller.

The female pig gives birth to the smallest number of offspring when it is her first time giving birth; at her second time giving birth she is in her prime. As she grows older, her giving birth is the same, but she mates for a shorter time. When female pigs reach fifteen years, they no longer generate offspring, but are getting old. If a female pig is well fed, she more quickly has the impulse to mate, whether old or young; but if when pregnant she becomes very fat, she has less milk after giving birth. The offspring, as regards the age of their parents, are best when these are in their

254. *GA* 725ᵇ34–726ᵃ6.
255. Perhaps 545ᵃ24–28.

prime and, as regards the seasons, when generated at the start of winter. The worst are those born in summer; for they are small, thin, and feeble. The male, if well-fed, is capable of mating at any time of day or night; but otherwise he is most so in the early morning. As he grows older, it is progressively less, as was also said previously.[256] Often when the males are impotent, whether because of age or because of weakness, and are unable to mate quickly, the female, because of being tired of standing, will lie down, and they have sex side by side. The female pig is most likely to conceive if she drops her ears when in heat; otherwise, when she is in heat again.

The female dogs mate not throughout life but up to a certain prime point, as, for the most part, mating and conception occur until they are twelve years old. Nonetheless, cases have been observed of females being mated and males begetting up to the age of eighteen or twenty. But age diminishes the capacity, with the result that they can neither generate nor conceive offspring, as is also the case in the other animals.

The female camel urinates backward and is mated in the way stated previously;[257] **$546^{b}1$** the mating season in Arabia is around the month of Maemacterion.[258] She is pregnant for twelve months and she gives birth to one offspring; for she is one-offspring-bearing. The female starts mating at three years and the male at three years. After giving birth, one year elapses before the female is ready to be mated.

The female elephant begins to be mounted, at the youngest, when ten years old, and at the oldest, when fifteen; the male mounts at when five or six years old. The mating season is spring. The male mounts again in three years after mating; but if he has made a female pregnant, he does not have intercourse with that one again.[259] The female is pregnant for two years and gives birth to one offspring; for she is one-offspring-bearing. The fetus is as big as a calf two or three months old.

5.15
The Hard-Shelled Animals

As regards the mating of the animals that mate, then, these are the ways they are. The generation of both the mating and non-mating ones must now be spoken about, and the hard-shelled animals first; for these are (one might almost say) the only kind that is wholly non-mating.

The purpuras gather together in the same place and produce the so-called comb. This is like a honeycomb, except not so neat; instead, it is as if many white chick-pea husks were compacted together. None of these, however, has any open ducts, and the purpuras do not come to be from them; on the contrary, these and all the

256. $546^{a}8–9$.
257. $540^{a}13–18$.
258. Mid-October–mid-November.
259. $630^{b}21–22$.

other hard-shelled animals grow from mud and putrefying material.[260] This comb is a sort of excretion both in these fishes and in the trumpet-shelled ones; for the trumpet-shelled ones also make combs. Though the hard-shelled animals that make combs come to be in the same way as the other hard-shelled animals; nonetheless, more of them come to be when others of the same kind have existed beforehand [in the same place]; for at the start of making the comb they emit a viscous slime that gets composed into the husk-like entities. All these dissolve and emit their contents at the bottom [of the sea]; and in this place the tiny purpuras that were composed at the bottom of the sea come to be. Purpuras are caught with these tiny ones on them, some of which have not yet acquired an exact shape. If they are caught before they "lay eggs," they sometimes lay eggs in the fish-baskets, not in some random place, but when they are in the same place, just as they do in the sea, and because of the narrowness, the comb is like a bunch of grapes.

There are many kinds of purpuras, some are large—for example, those that occur in Sigeum and Lectum; others are small—for example, those that occur in Euripus and around Caria. Those that occur in bays are large and rough; in most of those the bloom[261] is black, though in some it is red and small. Some of the large ones attain weights of one mina. Those that occur on seashores or around headlands are small in size, and their bloom is red. For the most part, those that occur in northern regions are black, those in southern regions red. They are caught in spring, when they are making combs; but they are not caught in the dog days; for then they do not feed, but hide themselves and lurk in lairs. They have the bloom between the *mêkôn* and the neck, and the attachment of these is a firm one. In color it looks like a white membrane. This is what people extract; when squeezed it stains and dyes the hand. A sort of blood vessel extends through it; and this, it seems, is the bloom. The rest is in nature a sort of astringent. When the purpuras have made their combs, then their bloom is worst. The small purpuras people break along with their shells; for it is not easy to extract the bloom; with the larger ones they remove the shell and extract it. That is also why they separate the neck and the *mêkôn*; for the bloom is between these, above the so-called stomach. For purposes of extraction, then, it is necessary for them to be separated. People hasten to break them while they are alive; for if the purpura dies beforehand, it vomits out the bloom; that is why they keep them in fish-baskets until they have gathered enough and have the leisure to do it. The ancient fishermen did not lower fish-baskets under the bait or attach them to it, with the result that while being pulled up the purpura often fell off; but nowadays they do attach a fish-basket, so that if the purpura does fall off it is not lost. It falls off most when it is full;[262] if it is empty, even to pull it off is difficult.

As regards the purpuras, then, these are the special affections.

260. *GA* 762ᵃ8–18.
261. Which yields the purple dye.
262. Of honeycomb.

The trumpet-shells come to be in the same way as the purpuras and in the same season. They both have their opercula in the same place, as do the other spiral-shelled animals, and they all have them from birth. They feed by extending the so-called tongue under the operculum. The purpura has a tongue bigger than a finger, with which it feeds and pierces cockleshells, as well as the shell of its own [kind]. Both the purpura and the trumpet-shell are long-lived; for the purpura lives for around six years, and its growth each year is evident from the intervals in the shell of the spiral. **547^{b}1**

The mussels also make combs.

As for the so-called lagoon oysters, wherever there is slimy mud, it is there that the starting-point of these is first composed. The cockles, the clams, the razor fishes, and the scallops get composed in sandy places. Pinnas grow upright from the bottom of the sea in sandy and muddy places. They have within themselves a pinna-guard, in some cases a small carid, in others a little crab; if they are deprived of it, they quickly die. In general, all the hard-shelled animals come to be in mud and spontaneously, and are of distinct sorts in accord with the difference in the mud: in slimy mud, oysters; in sandy mud, cockles and the others mentioned; around the hollows of rocks, sea squirts, barnacles, and the prevalent ones[263]—for example, the limpets and the nerites. All the animals of this sort have rapid growth, especially the purpuras and the scallops; for they become completely grown in a year.

Growing inside some of the hard-shelled animals are white crabs, altogether tiny in size, and most numerous in the trough-shaped mussels; then in the pinnas there are the so-called pinna-crabs. They also occur in the scallops and the lagoon oysters; they do not admit of any noticeable growth. Fishermen say that these come to be at the same time as the animals they inhabit. The scallops also disappear in the mud for a certain time, like the purpuras.

The shellfishes, then, grow in the way stated. Some of them grow in willow waters, some on the seashores, some in muddy places, some in hard and rough ones, and some in sandy ones. Some change their places, others do not. Among those that do not change them, the pinnas are rooted in place, while the razor fishes and the cockles, without being rooted, remain in place; when pulled up, they are no longer able to live. **548^{a}1**

{The so-called starfish is so warm by nature that when what it grasps is suddenly taken away, it is well boiled. They say too that it is a great pest in the straits of Pyrrha. Its shape is like the stars in drawings.

The so-called lungs[264] come to be spontaneously.

The shell that painters use is exceedingly thicker and the bloom supervenes on the outside of the shell. Animals of this sort mostly occur around Caria.

The hermit crab comes to be at the start from earth and mud, then enters empty shells. As it grows, it enters again into another larger shell—for example, in that of

263. Alternatively, "the ones that keep close to the surface of the water."
264. The Medusa jellyfishes.

the nerite, or that of the winkle, or that of some other animal of this sort, and often it goes into small trumpet shells. When it has entered, it carries the shell around with it and is nourished in it again; and as it grows , it enters again into another larger one.}[265]

5.16
The Sea Nettles and Sponges

The animals that do not have shells come to be in the same way as the hard-shelled animals—for example, the sea nettles and the sponges—in the hollows of rocks. Of sea nettles there are two kinds. Those that live in hollows do not detach themselves from the rocks; those that live on smooth flat rocks detach themselves and go to other places. The limpets also detach themselves and go to other places.

In the holes of sponges pinna-guards come to be. Over the holes there is a sort of spider web, by opening and closing which they catch small fishes, opening it to let them in, and closing it when they are inside.

There are three kinds of sponges, one is open-structured, one dense, and the third, **548b1** which they call "the sponge of Achilles," is the finest, densest, and strongest one; it is put under the lining of helmets and greaves and lessens the sound of a blow. This is the rarest one. Among the dense ones, the very hard and rough ones are called "goats."

Sponges all grow either on a rock or on sandbanks, and they get their nourishment in the mud. A sign of this is that when they are gathered, they are seen to be full of mud, which is precisely what occurs in other things that grow whose nourishment derives from their attachment. The dense ones are weaker than the open-structured ones because their attachment is less extensive.

Sponges also have perception, so people say. A sign of this is that if a sponge perceives that someone is about to tear it off, it contracts itself and is difficult to detach.[266] It does the same thing when there is a lot of wind and surf in order not to fall off. But there are some people who dispute about this, like the ones in Torone.

The sponge nourishes the animals that are in it, worms and other animals of the sort that, when the sponge is detached, are eaten by the small rock fishes along with its leftover roots; but if the sponge is broken off, it grows again from the remaining part and is restored to its former condition.

The open-structured ones are the largest, they mostly occur around Lycia; the dense ones are the softest; for the sponges of Achilles are firmer than these. In general, those that grow in deep calm waters are softest; for wind and storm hardens them, just like other things that grow, and suspends their growth. That is why sponges in the Hellespont are rough and dense and, in general, those that occur beyond or inside

265. This passage is of uncertain authenticity.
266. 487b9–11.

Cape Malea differ in softness and hardness. But they should not have too much heat either; for then they putrefy, like other things that grow. That is why those near headlands are best, if they are in deep water; for then, due to the depth, they are provided with good mixture of protections against both [extreme temperatures].

When they are unwashed and alive, they look black. Their attachment is not at one point nor at all points; for there are empty ducts in between. A sort of membrane is stretched around their underneath parts; and the attachment there is at several points. On the top, the other ducts are closed, except four or five that are evident to perception; that is why some people say that it is through these that the sponge takes in nourishment.

There is another kind of sponge called the "unwashable" because it cannot be washed. It has large ducts, but all the rest is dense; when it is cut open, it is denser and more viscous than the ordinary sponge, and the whole thing is lung-like. It is mostly about this kind that everyone is agreed that it has perception and is long-lived. In the sea, they are distinguished from the ordinary sponges due to the ordinary sponges being white when the mud is in them, while these are always black.

As regards the sponges and the hard-shelled animals, then, this is their mode of generation.

5.17
The Soft-Shelled Animals

Among the soft-shelled animals, the [female] crayfishes, after mating, conceive and retain their eggs for around three months, Scirrophorion, Hecatombaeon, and Metageitnion;[267] after that, they first lay the eggs in the folds under the stomach, and their eggs grow like larvae. It is the same in the case of the soft-bodied animals and the egg-laying fishes; for the eggs of all of them grow.

The egg of the crayfishes is crumbly and is divided into eight parts. For corresponding to each of the flaps on the side there is a cartilaginous entity to which the egg is attached, and the whole thing is like a bunch of grapes; for each of the cartilaginous entities is divided into several parts. These become visible after being separated, though at first sight the thing appears to be a unit. The largest ones are not those near the duct but those in the middle, and the smallest are those at the extremities. The size of the small eggs is that of fig seed. They are not directly contiguous to the duct, but in the middle of the animal; for at both ends, toward the tail and toward the thorax, there are two intervals [without eggs], most clearly presented; for this is the way the flaps also grow. The ones on the side cannot enclose the eggs; but when the end flap is superimposed, it covers all of them, and becomes a sort of lid for these. It seems

267. From mid-May to mid-August.

549ᵇ1 that, when laying its eggs, it brings them toward the cartilaginous entities by folding back the flat of its tail, and at once squeezing the eggs together[268] and staying doubled up, lays them. The cartilaginous entities increase in size in these seasons and become receptive of the eggs; for the animals lay their eggs into these cartilaginous entities, just as the cuttlefishes do into twigs and debris. This is the way, then, in which it lays its eggs, and after concocting them there for around twenty days, it jettisons them in a compact mass, as is evident to perception once they are outside; then from these the crayfishes come in around fifteen days, and they are often caught less than a finger-breadth in size. The crayfish lays its eggs before the rising of Arcturus[269] and jettisons them after it. In the hunchback carids pregnancy is around four months.

The crayfishes live in rough and rocky places, the lobsters in smooth ones; but neither lives in muddy ones; that is why lobsters occur in the Hellespont and around Thasos, and crayfishes around Sigeum and Mount Athos. Fishermen take the bearings of rough and muddy places from the headlands and other signs of this sort, when they wish to fish in the deep sea. In winter and spring, they live more near the shore, in summer, in the deep sea, pursuing in the one case heat, in the other cold.

The so-called bear crabs[270] lay their eggs at much the same times as the crayfishes; that is why in winter and in spring, before they lay them, they are best, and when they have laid them, worst.

The hard-shelled animals cast off their shell in spring, just as the snakes do their so-called old age,[271] both immediately after their birth and later too; both the crabs and the crayfishes do this. All the crayfishes are long-lived.

5.18
The Soft-Bodied Animals

The soft-bodied animals, after copulating and mating, have a white egg; and this in time becomes crumbly, like the eggs of the hard-skinned animals. The octopus lays an egg in lairs, or in a pot or some other hollow thing, that is like vine-tendrils or the fruit of the white poplar, as was said previously.[272] The eggs, when laid, cling around
550ᵃ1 the lair. The number of eggs is so great that when removed they fill a vessel much larger than the animal's head,[273] in which the eggs were contained.

The eggs of the octopus take around fifty days to develop, and from these, when they break, tiny octopuses crawl out, like venom-spiders, in large numbers. The nature of their limbs taken one by one is not yet clearly distinguishable, but their

268. Reading συμπίεσασα.
269. Mid-September.
270. Identity uncertain.
271. 600ᵇ15–17.
272. 544ᵃ8–9.
273. I.e., its body (523ᵇ24).

shape as a whole is evident. Because of their smallness and weakness the majority of them die. Some have been seen that are so altogether small that they are unarticulated, but that move when touched.

The cuttlefishes lay eggs and these are like large black myrtle-berries; since they are contiguous to each other, the entire thing is like a bunch of grapes, twined around a single one, and not easy to tear apart. For the male emits over them a sort of mucus-like liquid; and this supplies the viscosity. These eggs increase in size; at the outset they are white, but when the male has emitted the seminal liquid, they become larger and black. When the little cuttlefish has developed (it is entirely inside the egg and from the white part that it comes to be), the egg breaks, and it emerges. It comes to be when the female first lays the egg, which is like a sort of hailstone; for it is from this that the small cuttlefish grows, attached at its head, just as the birds are at the stomach. What sort of thing this umbilicus-like attachment is has not yet been observed, except that as the small cuttlefish grows the white part gets progressively smaller and, in the end, like the yolk [of the egg] in birds, the white part in these animals disappears. Just as in the other animals, the parts that first appear largest in these too are the eyes. Let A be the egg, B and C the eyes, and the small cuttlefish itself D.[274]

The cuttlefish conceives in spring and lays its eggs after fifteen days. When they have been laid, after another fifteen days something like a bunch of grapes comes about, and when these break, the small cuttlefishes come out. But if one splits open the egg before that, when they have already reached completion, the small cuttlefishes emit excrement, and their color changes from white to redder because of fear.

The soft-shelled animals incubate their eggs by placing them underneath themselves; but the octopus, the cuttlefish, and the other animals of this sort, when they **$550^{b}1$** have laid them, incubate them wherever their embryos happen to be, especially the cuttlefish; for its cavity is often seen on the eggs and on the earth. The female octopus sits sometimes on her eggs and sometimes at the mouth of her lair, extending her tentacles. The cuttlefish lays its eggs on the earth, around clumps of seaweed, clumps of reeds, and any sort of detritus, such as wood, twigs, or stones. And fishermen put down twigs for this purpose and on these the cuttlefish lays a long continuous string of eggs, like a vine-tendril.

The cuttlefish lays and spurts out its eggs with effort, as if the emission were accompanied by pain. The calamaries lay their eggs in the deep sea; like the cuttlefish, they lay their eggs in a continuous mass. The large calamary and the cuttlefish are short-lived. For, with a few exceptions, they do not live beyond a year. The same goes for the octopuses. From one egg comes one small cuttlefish. It is the same way in the case of the calamaries.

The male calamary differs from the female; for the female, as one could observe on opening its gill region, has two red entities that are like breasts, while the male

274. The reference is to a diagram, but it is unclear what exactly it is intended to illustrate. See *GA* $758^{a}23–25$.

does not have them. The cuttlefish also exhibits this difference, and the male is more variegated than the female, as was said previously.[275]

5.19
The Insects

As regards the insects, that the males are smaller than the females and mount on their backs, and what way they engage in mating, and that they are detached with difficulty, was said previously.[276] When they have mated, in most cases they quickly generate the offspring.

All the ones that mate give birth to larvae, except one kind of butterfly: these give birth to a hard entity, like a safflower seed, with a humor inside it. From the larvae the animal comes to be, but not from a certain part of it, as it is from eggs, but the whole thing grows and, when it becomes articulated, the animal comes to be.

Some insects come to be from animals of the same kind—for example, venom-spiders and spiders from venom-spiders and spiders, and likewise locusts, crickets, and cicadas. Some come to be not from animals but spontaneously: some from the dew falling on leaves, which in spring is in accord with nature, but often in winter too, when the weather is good and the south wind blows for longer periods of time; some in putrefying slimy mud and excrement; some in pieces of wood, some in pieces of growing plants, others in pieces already withered; some in the hair of animals; some in the flesh of animals; some in their residues, and of these, some in those that have been excreted, others in those still inside the animal—for example, so-called worms. Of these there are three kinds: one named the "flat worm," another the round worms, and third the *askaris* worms. From these nothing else comes to be; the flat worm alone is attached to the intestine and lays a sort of melon seed,[277] which doctors recognize as a sign of who has this worm.

Butterflies (*psuchai*), as they are called,[278] come to be from caterpillars, which come to be on green leaves, and especially on those of the radish, which some call "cabbage." At first, they are smaller than a grain of millet, then they are small larvae that grow, then in three days they are small caterpillars; after that, having grown fully, they do not move, change their shape, and are called "chrysalises." They have a hard sheath and move when touched. They are attached by cobweb-like ducts and have neither a mouth nor any other distinguishable part. After not much time has passed the sheath breaks open and the winged animal we call a "butterfly" flies out of them. At first, when they are caterpillars, they take nourishment and emit residue; but when they become chrysalises, they neither take food nor emit residues.

275. 525ᵃ12.
276. 5.8.
277. Actually, a segment of the worm called the "proglottis."
278. *Psuchai* also means "souls."

It is the same way with the other animals that come to be from larvae, both those larvae that come from the copulation of animals and those that do so in the absence of mating. For the larvae of the bees, the hornets, and the wasps, when they are young, take nourishment and contain visible excrement; but when they pass from being larvae to their transitional state, and are then called "nymphs," they neither take nourishment nor contain excrement, but being enclosed, they do not move until they are fully grown; then, after breaking what the cell is sealed with, they emerge.

Both the *hupera* and the *pênia* come to be from certain other caterpillars of the same sort, which undulate in progressing: they advance one part of the body while doubling up the rest and in this way go forward. Each of these gets its own color from that of its caterpillar.

From a certain large larva, which has horns of a sort and is different from the others, first a caterpillar comes to be when the larva changes, then a *bombulis*, then from this a *nekudalos*; and it is in six months that it makes all these changes of shape. It is the cocoons of this animal that certain women undo, unwinding them and then weaving with the threads; the first to weave them is said to have been a woman in Cos—Pamphile, daughter of Plates.

From the larvae in pieces of withered wood, the stag beetles[279] come to be in the same way; first with the larvae being unmoving, then, when the sheath breaks open, the stag beetles emerge. From the stag beetles {. . .}[280] the mole crickets come to be; these too have wings.

From the small flat animals that run upon the surface of rivers the gadflies come to be; that is why gadflies are most numerous near waters where animals of this sort are.

From certain black and hairy caterpillars that are not large, first, glowworms come to be—not the flying ones; these in turn change, and winged animals come to be from them, which are called *bostruchoi*.[281]

Gnats come to be from river worms. The river worms come to be in the mud of wells and wherever water collects that contains an earthen sediment. At first, this mud putrefies and takes on a white color, then becomes black, and finally bloodred; when it has become like this, things grow from it that are like very tiny strands of red seaweed. For a certain time these move around, still attached; then they break apart and are carried around by the water; these are the so-called river worms. After a few days they stand upright on the water, unmoving and hard; then when the sheath has broken open the gnat is incubated above it, until the sun or the wind sets it moving. Immediately thereafter it flies.

For all the other larvae too and all the animals that break out from larvae, the starting-point of their generation is due to the sun or the wind.

279. Reading κάραβοι here and at 551^b19.

280. There is a lacuna in the text at this point.

281. Literally, "curls of hair."

The river worms come to be in larger numbers and more quickly in places that have all sorts of sediment—for example, in kitchens and in plowed fields; for places of this sort putrefy more quickly. In fall too they come about in larger numbers; for then there is less moisture.[282]

The ticks come to be from dogtooth grass, the cockchafers from larvae in the dung of cows and asses. The dung beetles roll excrement into a ball, hide inside it in winter and give birth to small larvae; dung beetles come to be from these. Winged animals also come to be from the larvae in the pulses, in a way similar to the ones mentioned.

The flies come to be from the larvae in manure when a part is separated out;[283] that is why those concerned with working on this separate out the rest of what has been mixed, and say that then the manure has been "worked up." The starting-point of the larvae is small; for, first, they become red even there, and from being immobile take on movement, as if naturally; then a small immobile larva emerges; then, after moving, it becomes unmoving again; and from this comes a completely developed fly, and is set moving by wind or sun. The horseflies come to be from pieces of wood. The bud-eaters[284] from small larvae undergoing change; these larvae come to be in the stalks of
552[b]1 cabbages. Blister beetles come to be from caterpillars that are on fig, pear, or fir trees (for larvae come to be on all these), and also from those on the dog rose; and they are also impelled by foul-smelling things because they came to be from wood of such sort. The mosquitos come from small larvae that come to be from vinegar sediment.

In fact, animals even appear in things that seem to be least subject to putrefaction—for example, in old snow. For old snow becomes redder, which is why the larvae in it are of this color; they are hairy too; but those in Media that come from snow are large and white; all are hard to set moving. In Cyprus, in places where copper ore is smelted, and thrown there for many days, beasts come to be in the fire; they are small but larger than large flies, are winged, and hop and go about through the fire. The larvae and these beasts die when separated from the fire, in the one case, and from the snow, in the other. That it is possible for certain animals to be composed so as not to burn, the salamander makes evident; for it, they say, by walking through the fire puts the fire out.

On the river Hypanis in the Cimmerian Bosporus around the time of the summer solstice, sacs of a sort, larger than grapes, are carried down by the current, from which, when they break open, a winged four-footed animal emerges. It lives and flies until evening, but as the sun goes down it wastes away, and at sunset it dies, having lived one day, that is why it is called the "dayfly."

Most of the animals that come to be from caterpillars and larvae are at first held fast by spiderwebs.

This, then, is the mode in which these animals come to be.

282. *GA* 763[a]29–30.

283. Probably the old manure that has already putrefied, the rest being the newer part of the mixture that has not yet putrefied.

284. Curculionid beetles, probably *Haltica oleracea*.

5.20
The Tracker Wasps

The wasps that are called "trackers," which are smaller than the others, carry venom-spiders they have killed to a wall or some other sort of place that has a hole in it, and, coating[285] it with mud, lay their eggs in it, and from these the tracker wasps come to be. Some of the coleopterans, and some of the small nameless animals, make small mud holes either on tombstones or walls and lay their larvae there. **553^a1**

In pretty much most cases, the time of generation from start to end is three or four weeks. For most larvae and larvae-like animals it is three weeks; for the egg-laying ones, for the most part, four. Among these, seven days after mating, the eggs are composed, and during the remaining three weeks the adults brood and hatch the offspring, as in the case of the spiders and other animals of this sort. For most of them, the changes take place after three or four days, in just the way that crucial moments occur in diseases.

This, then, is the mode of generation of the insects. They die when their parts shrivel, just as the larger animals do in old age. When winged insects die, their wings also contract in fall; as to the horseflies, when they die, their eyes also become dropsical.

5.21
The Bees (1)[286]

About the mode of generation of the bees people do not all accept the same view. For some say that the bees neither give birth nor mate, but fetch the seed: some say, from the flower of the reed; some, from the flower of the *kalamos*; some, from the flower of the olive—and a sign of this, they say, is that when the olive crop occurs, that is when the most swarms are sent forth. Others say that they fetch the seed of drones from some of the plants mentioned, but that the seed of bees is begotten by the leaders.[287]

Of the leaders there are two kinds: the better one is yellowish-red, the other black and variegated; their size is double that of the worker bees; the part below the diaphragm is one-and-a-half times as large as the rest. They are called "mothers" by some people, on the supposition that they do the generating. A sign of this, they say, is that the seed of drones appears even when there is no leader present, while that of the bees does not appear. Others say that they mate, and that the drones are male, the bees female. **553^b1**

285. Reading καταχρίσαντες.
286. Also 9.40, *GA* 3.10.
287. The king (actually queen) bees.

The generation of the bees other than the leaders takes place in the cells of the comb; the leaders come to be below the comb, where they are suspended separately, six or seven of them, and grow in a contrary way to the rest of the seeds.

The bees have a sting, but the drones do not. The kings or leaders have a sting, but do not sting; that is why some people think that they do not have one.

5.22
The Bees (2)

The following are the bee kinds. The best kind is small, round, and variegated; another is large and similar to the hornet; a third is the so-called robber (it is black and has a flat abdomen); a fourth is the drone, in size the largest of all, but stingless and sluggish; that is why some beekeepers put netting around the hives so that the bees can enter, but the drones cannot, because they are too large.

There are two kinds of leaders, as was said previously.[288] There are several leaders in each hive, and not only one; the hive is destroyed if there are not enough leaders present in it (this is not because there is anarchy, but rather, as some people say, because they contribute to the generation of the bees), but also if there are many leaders; for they break it apart.

When spring is late, and when there are droughts and blight,[289] the seed is less; but when there is a drought they work more on the honey, while when there is a lot of rain, more on the seed. That in fact is why olive crops and swarms occur at the same time.[290]

They work first on the comb, then deposit the seed into it, "from their mouth," as some people (those who say that they fetch the seed from elsewhere) say; then in the same way they deposit the honey for nourishment, part in summer and part in fall; fall honey is better. The comb is produced from flowers; the sealant they fetch from the gum of trees; the honey is what falls from the air,[291] especially at the risings of the stars and when a rainbow falls [to earth]; in general, there is no honey before the rising of the Pleiades.[292]

The bee, then, as was said, makes the comb from flowers; but the honey it does not make, but fetches what falls [on plants]: a sign of this is that within one or two
554ᵃ1 days beekeepers find the hives full of honey. Further, flowers appear in fall, but [new] honey does not, when [the old] has been removed. Once the original honey has been removed, and there is no or scant nourishment still in the hive, honey should appear, if indeed the bee makes it from flowers.

288. 553ᵃ25–30.
289. Caused by a lot of rain.
290. 553ᵃ20–23.
291. I.e., dew.
292. Early in May.

Honey becomes composed when it is concocted; for, at the start, it is like water and stays liquid for several days (that is why if it is removed during these days, it does not have thickness), but in around twenty days it becomes composed. The honey from the [flower] juice is immediately clear to perception; for it differs in sweetness and in thickness. The bee fetches it from all the flowers whose flower is in the shape of a calyx, and from all the others that have sweetness, without damaging the fruit; and taking up the juices of these with the part that is tongue-like, they carry them off. The swarms have their honey taken when the wild fig appears. They generate the best grubs when the honey is being worked on. The bee carries the wax and the *erithakê*[293] around its legs; it vomits the honey into the cell. When it has released the larva, it broods like a bird. In the comb, the larva, which is small, lies obliquely; later, it rises up straight on its own and takes nourishment, and is held by the comb so as to be its captive.

The seed of the bees and of the drones is white, and from it the larvae come to be, which, when they grow, become bees and drones. The seed of the kings is reddish in color, and its fine texture is like that of thick honey. Its bulk from the outset is much the same as that of what comes to be from it. A larva does not come to be from it beforehand, but rather a bee appears[294] directly. When a bee has laid [a seed] in the comb, there is always honey right opposite it. The grub grows feet and wings when it is left captive; and when it has reached the end of its development, it breaks open the membrane, and flies out. It emits excrement while still a larva, but not afterward, **$554^{b}1$** except if it does not get out, as was said previously.[295]

If one removes the head of the grub before it has wings, the bees eat these; if one nips off a drone's wings and lets it go, the bees themselves eat off the wings of the remaining drones.

The life of the bees is six years; but some live for seven. If a hive lasts for nine or ten years, it is believed to have survived well.

In Pontus there are some very white bees; these produce honey twice a month. (The bees in Themiscyra, near the river Thermodon, make combs in the earth and in hives that contain not much—indeed, very little—wax, but thick honey; the comb is smooth and even.) They do not do so always, but in winter; for in Pontus there is a lot of ivy, which flowers in that season, from which they fetch the honey. A white and very thick honey is brought down to Amisus from higher up, which the bees produce without combs against trees. Honey of this sort is also produced in other places in Pontus. There are also bees that make triple combs in the earth; these contain honey, but do not contain larvae. Not all combs are of this sort, nor do all bees make this sort.

293. Probably beebread. Also $623^{b}23$ (*kêrinthos*), $626^{a}7$ (*sandarakê*), $627^{a}22$ (*erithakê*).
294. Reading φαίνεται.
295. $551^{a}29$–$^{b}5$.

5.23
The Hornet and the Wasp

The hornets and the wasps make combs for their seed. When they have no leader but are wandering about and not finding one, the hornets make them in some high place, the wasps in holes; when they have a leader, under the earth. All their combs are hexagonal, like those of the bees, but they are not composed of wax; instead, their comb is composed of a bast-like and spiderweb-like material. The comb of the hornets is much neater than that of the wasps. Just like the bees, they deposit a seed, the size of a drop, on the side of the cell, and it adheres to the cell
555ᵃ1 wall. But there is not seed present in all the cells at the same time: in some there are animals already large enough to fly; in some, nymphs; in some, those that are still larvae. There is excrement only around the larvae, as also with the bees. For as long as they are nymphs, they are unmoving, and their cell is sealed up. Right opposite the seed in the cell, there is honey, the size of a drop, in the combs of the hornets. The grubs [of bees and hornets] appear not in spring but in fall; they grow most noticeably at times of the full moon. The seed and the larvae do not adhere to the bottom of the cell, but to the side.

5.24
The Bombukia

Some of the *bombukia*[296] build a pointed nest of clay against a stone or something of that sort, and coat it with some sort of spittle. This nest is very thick and hard; indeed, it is barely possible to break it apart with a spear head. It is there that they lay their eggs and there that small white larvae come to be inside a black membrane. Separate from the membrane, in the clay, there is wax present; this wax is much paler than that of the bees.

5.25
The Ants

Ants also mate and give birth to small larvae that do not attach to anything; these keep growing from small round entities at first until they become larger and articulated. Their generation occurs in spring.

296. Perhaps mason bees, though their nest is rounded.

5.26
The Land Scorpions

Land scorpions also give birth to numerous small egg-like larvae, and they brood. When their development is complete, the parents are thrown out and killed by the offspring, as in the case of the spiders; for often the number of offspring is around eleven.

5.27
The Spiders

The spiders all mate in the way that was stated previously,[297] and generate small larvae first; for these become spiders by changing in their entirety and not in their parts, since they are round at the start. When the spider has given birth to the larvae, it broods, and in three days they become articulated. All spiders give birth in a web, some in a thin small one, others in a thick one, some entirely within a round container, others encompassed by the web only up to a certain point. **555b1**

The spiders do not all come to be at the same time; but they immediately spring up and emit web. The juice in the larvae when squeezed is the same as in the young spiders themselves—thick and white.

The meadow spiders initially give birth to their larvae in a web, of which one half is attached to the spiders themselves, the other half external; and it is in this that, by brooding, they produce the animals. The venom-spiders give birth to their larvae in a thick basket, woven by them, which is where they brood. The smooth spiders give birth to a smaller number, the venom-spiders a larger number; and when they have grown, they encircle the venom-spider, kill their female progenitor, and throw her out, and often the male too, if they get hold of him; for he broods along with the female. Sometimes there are even as many as three hundred offspring around a single venom-spider.

The small spiders become completely grown in around four weeks.

5.28
The Crickets

The crickets mate in the same way as the other insects, with the smaller mounting the larger (for the male is smaller). The females lay eggs in the earth, after having planted firmly there the tube they have at their tail; the males do not have this. They lay them in a compact mass and in the same place, so that it is like a honeycomb. Then, when

297. 542a12–17.

they have laid them, there egg-like larvae come to be that are enveloped by a sort of fine-grained earth as by a membrane; in this[298] they are thoroughly concocted. These embryos are so soft that they compress if one touches them. They are not on the surface but a little under the earth. When they have grown to maturity, they emerge from the earthen sheath as small black crickets; then their skin breaks open and they immediately become larger.

The females lay eggs at the end of summer, and after having laid them, they die; for at the same time as they lay them, larvae[299] appear around their neck. And the males die around the same time. They emerge from the earth in spring.

Crickets do not occur either in hill-country or in poor soil, but only in flat and broken soil; for it is in the cracks that they lay their eggs. The eggs remain in the earth during winter; but once summer comes, crickets develop from the embryos of the previous year.

5.29
The Locusts

The locusts lay eggs in the same way, and when they have laid them, they die. Their eggs are destroyed by fall rains, when these are abundant; when a drought occurs, locusts come to be in greater numbers, because of not being likewise destroyed, since their destruction, at any rate, seems to lack order, and to come about in whatever way it does by luck.

5.30
The Cicadas

There are two kinds of cicadas: the small ones, which are the first to appear and the last to die; and the large ones (the ones that sing), which appear later and die earlier. In the small ones and the large ones alike, there are some that are divided at the diaphragm (the ones that sing), and others that are undivided (the ones that do not sing). People call the large ones that sing "chirpers" and the small ones "cicadellas"; of these, the ones that are divided sing a little.

Cicadas do not occur where there are no trees; that is why in Cyrene they do not occur in the flatland, but do occur in large numbers around the city, especially where there are olive trees; for these do not produce much shade. For in cold places cicadas do not occur, which is why they also do not occur in thickly shaded groves.

298. Reading ἐν ταύτῃ.
299. Of some parasitic insect.

The large ones and the small ones mate in the same way, with their underneath parts being united together. The male emits into the female, as in the other insects. The female has a sex organ that is divided in two (a female is the one into which the male emits).

They lay their eggs in uncultivated lands, boring a hole with the pointed part they have at the rear, just like the locusts; for locusts too lay their eggs in uncultivated lands, which is why they occur in large numbers in Cyrene. The cicadas also lay their **556b1** eggs in the stakes they use to support vines, boring through the stakes, and in the stalks of the squill. These embryos burrow into the earth.

The cicadas come to be in greater numbers when there is an abundance of rain. The larva, having grown in the earth, becomes a mother cicada[300] (indeed, they are best at this point, before they break open their sheath). When the time of the solstice comes, these emerge at night; the sheath immediately breaks apart, and cicadas come to be from the mother cicadas; these become black and hard immediately, and they sing. The ones that do the singing are males in both kinds; the others are females.

At first the males are more pleasant tasting, but after mating, the females; for they contain white eggs.

As they fly up when one scares them away, they emit a liquid like water (which makes farmers say that they are urinating), have residue, and nourish themselves on dew.

If when moving it, one advances one's finger, bending back the tip and then extending it again, the cicadas better stand their ground than when one extends it from the outset, and they will climb up one's finger; for because of seeing indistinctly, they climb it as if it were a moving leaf.

5.31
The Fleas, Lice, and Other Parasites

All the insects that are not carnivorous but live on the juices of living flesh, such as the lice, the fleas, and the bed bugs, generate from their mating what are called "nits," but from these nothing else again comes to be.

Among these, the fleas come to be from the smallest bit of putrefying material (for wherever dry excrement occurs, it is there that they get composed); the bed bugs come to be from the moist secretion of living animals as it becomes composed outside them; the lice come to be from flesh.

Lice come to be when, as they are about to do so, small eruptions of a sort appear that contain no pus; if one pierces these, lice emerge. In some human beings this is a disease that occurs when there is a lot of liquid in the body. Some,

300. A nymph.

557a1 indeed, have been observed to die in this way, like Alcman the poet, they say, and Pherecydes the Syrian. Also, in certain diseases large numbers of lice occur.

There is also a kind of lice that are called "wild," which are harder than the common sort; these are also very hard to remove from the skin. In the case of children, the heads become lice-infested; in the case of men, less so. Women are more infested with lice than men. All those in whom they appear on the head have fewer headaches.

Lice also appear in many other animals. For even the birds have them; and so-called pheasants, unless they take dust baths, die from the lice. Also all the other animals that have feathers with a quill, and those that have hair, have then. Except the ass, which has neither lice nor ticks. The cows have both; the sheep and the goats have ticks, but do not have lice; and the pigs have lice that are large and hard. In dogs the so-called dog-fleas occur. All the lice, in the animals that have them, come to be from the animals themselves. Lice are more numerous in bathing animals that have lice when they change the waters in which they bathe.

In the sea, lice occur on the fishes, but these do not come from the fishes themselves but from mud. Their appearance is similar to that of the many-footed woodlice, except that they have a flat tail. There is only one form of sea lice, and they occur everywhere, particularly on the red mullet. All these insects are many-footed and bloodless. The gadfly of the tunas occurs around the fins; it is like the scorpions, and about the size of a spider. In the sea between Cyrene and Egypt there is a fish that accompanies the dolphin called a "louse"; it becomes the fattest of all due to having the benefit of abundant nourishment from the dolphin's hunting.

5.32
Mites and Other Small Animals

557b1 Other small animals also come to be, as was said previously.[301] Some do so in wool and whatever is made of wool—for example, moths. These grow in greater numbers when the wool is dusty, and occur most if a spider is shut up inside; for it drinks up any liquid there may be in it, and dries it. This larva also occurs inside a sheath. And an animal occurs in wax that has become old, as in wood, and this is believed to be the smallest of all animals; it is called an *akari*, and is white as well as small. Others occur in books: some are like those in clothes, some like scorpions without the tail, and altogether small. In general, they occur in (one might almost say) everything, both in dry things that are becoming wet, and in wet ones that are becoming dry, and in whatever provides a living for these.

There is also a small larva called a "wood-destroyer," than which no other animal is less strange. For its head, which is variegated, projects outside its sheath; it has feet at its extremity, like the other larvae; but the rest of its body is in a spiderweb-like

301. 5.19.

sheath; and around it are dry twigs that seem to have been stuck to it as it walked along. These twigs, though, are a natural part of the sheath; just as the shell is in relation to the snail, so the entire ensemble is in relation to the larva; and the twigs do not drop off, but can only be pulled off, like natural parts; and if one removes its sheath, the animal dies and becomes as useless as the snail when its shell has been removed. As time goes on, this larva too, like the caterpillars, become a chrysalis, and lives without moving; but what winged animal comes from it has not yet been observed.

The fruits of the wild fig contain the so-called *psên*.[302] This occurs first as a larva, then, when its skin bursts open, the *psên* flies out leaving it behind, crawls into the wild figs through their mouths, and causes the figs not to fall off.[303] That is why farmers hang wild figs on domestic fig trees, and plant wild fig trees near domestic ones.[304]

5.33
The Turtle, the Lizard, and the Crocodile

Among the blooded egg-laying four-footed animals, generation occurs in spring, though mating is not in the same season in all cases, but for some it is spring, for some summer, and for others around fall, so that in each case the season to come is advantageous for the generation of their offspring. **558ª1**

The turtle lays eggs that are hard-skinned and two-colored, like those of the birds, and when it has laid them, it buries them and makes the ground trodden hard above them; when it had done this, it regularly broods on them on the surface; the eggs hatch in the following year. The freshwater turtle emerges from the water to lay its eggs, digs a cask-like hole, lays them in it, and abandons them; after allowing less than thirty days to elapse, it digs them up, hatches them quickly, and leads its offspring into the water immediately. The sea turtles also lay eggs in the earth that are like those of the tame birds, bury them, and brood on them at night. They lay a large number of eggs; indeed, they lay up to a hundred eggs.

The lizards and the crocodiles, both the terrestrial and river crocodiles, lay their eggs in the earth. Those of the lizards hatch spontaneously in the earth; for the lizard does not live for more than a year; indeed, the life of the lizard is said to be six months. The river crocodile lays a large number of eggs, in most cases around sixty, that are white in color, and it broods on them for sixty days (for in fact its life also lasts a long time), and from eggs that are very small comes an animal that is very large; for the egg is no larger than a goose's, and the offspring from it is of a corresponding size, yet it grows to a length of even seventeen cubits. Some say that it grows for as long as it lives.

302. The fig wasp.
303. Reading διὰ στομάτων, καὶ ποιεῖ. The mouths are the figs' ostioles.
304. *GA* $715^{b}21$–25.

5.34
The Snakes

Among the snakes, the viper is externally live-bearing, having first been internally egg-laying; its egg, like that of the fishes, is single-colored and soft-skinned. The offspring appears on the upper side of the egg, and is not encompassed by a shell-like husk, just as those of the fishes also are not. It gives birth to the little vipers in a membrane, which break open in three days; but sometimes those inside emerge after eating through it themselves. It gives birth to them one by one in a single day and gives birth to more than twenty.

558[b]1 The other snakes are externally egg-laying, and their eggs are continuous with each other like beads on women's necklaces; when they have laid them in the earth, they brood on them. They hatch too in the following year.

BOOK 6

6.1
The Birds

Of the generation of the snakes and of the insects, then, and further of the egg-laying four-footed animals, this is the mode.

The birds, for their part, all lay eggs, though the season for mating and giving birth are not the same for all of them. For some mate and give birth (one might almost say) all the time—for example, the chicken and the pigeon. The chicken does so the whole year, except during the two months around the winter solstice.[305] Some, even ones that are true to stock,[306] lay a large number of eggs—up to sixty—before brooding; and yet those that are true to stock are less prolific than those that are not true to stock. The Adriatic chickens,[307] though small in size, lay every day; but they are bad-tempered and often kill their offspring. Their colors are variegated.

Some tame chickens lay twice a day, and cases have been observed where, after laying exceedingly many eggs, they have died suddenly.

The chickens lay eggs, as was said,[308] continuously. The pigeon, the wood pigeon, the turtledove, and the wine-colored pigeon lay two eggs, but the pigeons lay even ten times a year.

305. 544[a]31–33.
306. 488[b]18–20, *GA* 749[b]30–34.
307. Perhaps a kind of bantam (also *GA* 749[b]28–30).
308. 558[b]13–14.

The majority of birds lay eggs in the season of spring. Some of these lay many eggs, but lay many eggs in one of two ways: some lay often, like the pigeons; others lay many eggs, like the chickens. All the crook-taloned birds lay few eggs, except the kestrel; among the crook-taloned birds, it lays the most eggs; as many as four have been observed, but it lays even more.

The other birds lay eggs in nests, but the non-flyers—for example, the partridges and quails—never lay in nests, but on the ground, and cover them with twigs. It is likewise with the lark and the *tetrix*. These birds build their nests in places sheltered from the wind. The bird that the Boeotians call the *eirops* is the only one that goes down into holes in the ground and nests.

Thrushes, like swallows, build their nests of clay, in the high branches of trees; they[309] build them next to each other in a continuous string, so that because of its continuity it is like a necklace of nests. The hoopoe is the only one among the birds doing their hatching by themselves[310] that does not build a nest, but goes into tree trunks and lays its eggs in their hollows, without collecting anything.[311] The {. . .}[312] builds in houses or on rocky cliffs. The *tetrix*, which the Athenians call the *ourax*, builds its nest neither on the ground nor in trees, but in low-growing plants.

6.2
The Egg

The egg of all the birds alike is hard-skinned, if it is fertile and not ruined (for some chickens lay soft ones), and two-colored, the white part outside, the yellow part inside.

The eggs of the river birds and marsh birds differ from those of the birds of dry land; for those of the aquatic birds have proportionally much more yellow than white. And the [exterior] colors of the eggs differ in accord with the kinds of birds; for the eggs of some birds are white—for example, the pigeon's and the partridge's; some are yellow—for example, those of the marsh birds; some are speckled—for example, those of the guinea fowls and the pheasants. Those of the kestrel are red, like vermilion.

The egg itself exhibits a difference; for it is pointy at one end and broader at the other; when coming out, the broader leads the way. Long pointy eggs are females; round ones and those rounded at the pointy end are males.

They are hatched by being brooded on by the birds; nonetheless, this can happen spontaneously in the earth, as in Egypt, where they are buried in a dunghill. And in Syracuse, so they say, a man who loved to drink used to puts eggs in the ground

309. Presumably the swallows are meant; thrushes do not build such nests.
310. I.e., that are unlike the cuckoo.
311. Cf. $616^{a}35$–$^{b}1$.
312. The text is uncertain.

under his sleeping mat, and drink continuously until he had hatched them. And cases have been observed of eggs placed in warm vessels getting thoroughly concocted and hatching spontaneously.

The semen of all the birds is white, just like that of the other animals; when she is mated, the female takes it in up near the diaphragm. At first it appears a white small entity, then red and bloodlike, but as it grows, it becomes yellow or golden all over. At the time when it becomes more ready to hatch, it undergoes differentiation, with the yellow inside and the white outside surrounding it. When its development is complete, the egg detaches itself and emerges at the critical point of changing from soft to hard, so that when it emerges it is not yet hard, but when it has emerged, it solidifies immediately and becomes hard, unless it is diseased when it emerges. Cases have occurred where entities resembling the egg at a certain point in its development (for it is uniformly yellow all over, as the yolk is later on) have been seen in a male chicken that is cut open under the diaphragm (precisely where the females have their eggs); in appearance these are entirely yellow, and in size as large as an egg; in account, these are put in the monstrous class.

Those who say that wind-eggs are the remains of eggs that previously came to be from mating, do not speak truly; for it has been adequately observed that unmated young female chickens and geese lay wind-eggs. Wind-eggs are smaller in size, less pleasant in taste, and more liquid than fertile ones, but are more numerous; when they are put under the female bird, their liquid part does not solidify, but rather the yellow and the white remain as they were. Wind-eggs are laid by many birds—for example, the chicken, the partridge, the pigeon, the peahen, the goose, and the Egyptian goose.[313]

The eggs of brooding females are hatched more quickly in summer than in winter;
560ᵃ1 for the female chickens hatch them in eighteen days in the summer, but in winters sometimes in twenty-five days.

Bird also differs from bird in that one is more fond of brooding than another.

If thunder occurs during brooding, the eggs are ruined.

Wind-eggs that are called *kunosoura* and *ouria* by some people are laid more in summer. Wind-eggs are called *zephuria* by some people because it is evident that in spring female birds are receptive of the winds. They lay something of the same sort if they are stroked with the hand in a certain way.

Wind-eggs become fertile, and eggs that are already present from a previous mating change from one kind to another kind, if, before the yellow changes to the white,[314] the female that has the wind-eggs or the fertile ones from another male bird is mated—that is, the wind-eggs become fertile, and the ones previously present correspond in kind with the male bird that mated second. But if the yellow is already changing to the white, there is no change: the wind-eggs do not become fertile, nor

313. Also 593ᵇ22.
314. 559ᵇ9–12.

do the fertile ones change to the kind of the one mating [second]. Also, if mating is interrupted while the existing entities are still small, what was already present does not at all increase in size afterward; but if mating occurs again, the increase in size is rapid.

The yellow and the white of the egg are of a contrary nature, not only in color, but also in capacity; for the yellow solidifies due to the cold, while the white does not solidify, but becomes more liquid; due to fire, on the other hand, the white solidifies, while the yellow does not solidify, but remains soft, unless it is completely burned, and it is by boiling than by roasting that it gets more composed and dry.

The two are separate, divided from each other by a membrane. The "hailstones" at the starting-point of the yellow do not, as some people suppose, contribute anything to generation: there are two, one above and one below. The following also happens where the yellow and the white are concerned: when, after having taken them out of their shell, one pours several of these together into a vessel and boils them gently, not over an intense fire, all the yellow comes together in the middle and the white forms **$560^{b}1$** a circle around it.

Among the chickens, the young females are the first to lay eggs, at the start of spring, and they lay more than the older birds; but the eggs of younger ones are smaller in size.

In general, if the female birds do not brood on eggs, they weaken and fall ill. After mating, the female birds shudder and shake themselves, and often throw straw around (they sometime do this after laying them too); the pigeons drag their rump on the ground, and the geese dive down under the water.

The pregnancies and the conceptions of wind-eggs occur rapidly in the case of most of the birds—for example, in the female partridge, when it is ready for mating; for if she stands downwind from the male, she becomes impregnated and immediately becomes useless for the hunt;[315] for the partridge seems to have a remarkable organ of smell.

The generation of the egg after mating and in turn the generation of the young bird from the concocted egg do not occur in equal periods of time in all cases, but differ in accord with the sizes of the progenitors. After mating, the egg of the chicken gets composed and completed, for the most part, in ten days; that of the pigeon, in slightly less time. The pigeons are able to hold back the egg even when already on the point of laying them; for if it is annoyed by someone, either around nesting or by having a feather pulled out, or if something else hurts or displeases it, it holds it back and does not lay though it was on the point of doing so.

Special to the pigeons as regards mating are the following. They kiss each other when the male is about to mount the female, otherwise he would not mate. An older male does this the first time; subsequently, however, he mates without having kissed; the younger ones always kiss before they mate. This is, then, something special that

315. *GA* $751^{a}13–24$.

they are doing. Further, the females mount each other when no male is available, after having kissed like the males; and though they emit nothing into each other, they lay more eggs than when fertilized ones come to be. From these no young birds come to be but all eggs of this sort are wind-eggs.

6.3
The Egg of the Chicken

Generation from the egg occurs in the birds in the same mode in all of them, though the times of completion differ, as was said previously.[316]

In the case of the female chickens, after three days and nights have passed the first signs are given; in the case of larger birds than these, the time is longer; in the case of smaller ones, it is less long. During this time the yellow has come to be while going up toward the pointy end, which is precisely where the starting-point of the egg is, and where the egg is hatched; and the heart, which is no larger than a pinpoint of blood, appears in the white. This point beats and moves like an animate being; and from it two blood-vessel-like ducts filled with blood and spiraling lead to each of the two surrounding sheaths when the embryo has grown. A membrane containing blood-filled fibers already encompasses the yolk by this time coming from the blood-vessel-like ducts. A little afterward the body too is already distinctly formed, altogether small at first and white. The head is clearly visible, and in it the eyes, particularly swollen up; and this lasts till late in the process; for it is only after a long time that they become small and contract. At first, the lower part of the body appears to be no part at all in comparison to the upper one. Of the two ducts that extend from the heart, one leads to the encompassing chorion, the other to the yellow like an umbilical cord. The starting-point of the chick comes from the white; its nourishment comes through the umbilical cord from the yellow.

From the tenth day on, the whole chick is clearly visible, and all its parts. Its head is still larger than the rest of the body, and the eyes, not yet having sight, than the head. The eyes, if they are extracted around this time, are found to be larger than beans and black; when their skin is removed, there is a liquid inside, white, cold, and very glittery in the sunlight, but nothing solid.

As regards the eyes and the head, then, this is the way things stand.

At this time the viscera, the region of stomach, and the nature of the intestines, are already evident; and the blood vessels, visibly extending from the heart to the umbilical cord, already exist. From the umbilical cord a blood vessel extends to the membrane encompassing the yellow (the yellow at this time is already liquid, and more so than is in accord with nature); the other extends to the membrane encompassing the whole membrane in which the chick is enclosed, the membrane of the

316. 560ᵇ16–19.

yellow, and the liquid between these. {For as the chick grows, part of the yellow goes upward and part downward little by little, and in the middle is the white liquid; the white is below the yellow, as was the case at first. On the tenth day the white is outermost, already small in quantity, viscous, firm, and pale yellow.}[317] For each of these is assigned to its position in the following way. First, and outermost, next to the shell, is the membrane of the egg—not the membrane of the shell, but the one under it. Within this a white liquid is found, then the chick, and around it a membrane keeping it separate, so that the chick is not in the liquid; under the chick is the yellow, into which one of the two blood vessels mentioned leads, while the other leads to the encompassing white. The entire thing is encompassed by a membrane with a serum-like liquid. Then there is another membrane around the fetus itself, as was said,[318] separating it from the liquid. Under this, surrounded by another membrane, is the yellow, into which extends the umbilical cord coming from the heart and the great blood vessel, so that the fetus is not in either of the liquids.

Around the twentieth day, the chick already utters a cry and moves inside, if one disturbs it after taking apart the shell, and it is already feathered when, beyond twenty days, the hatching of the eggs occurs. The chick has its head over its right leg close to the flank, and its wing over its head. And at this time both membranes are visible: the chorion-like membrane that comes after the outermost membrane next to the shell, to which extends (as was said)[319] one of the umbilical cords (and the chick is by this time wholly within it), as well as the other membrane, also chorion-like, the one around the yellow, into which extends (as was said) the other umbilical cord; both (as was said)[320] come from the heart and the great blood vessel. At this time, the umbilical cord that extends to the outer chorion gets detached from the animal and contracts, while the one that goes to the yellow is joined to the chick by its thin intestine, and most of the yellow is already inside the chick, and there is yellow sediment in the stomach. Around this time too, it emits residue toward the outer chorion, and has it in its stomach; the residue to the outer one is white, and there is a white substance inside. In the end, the yellow, which is always becoming smaller as time goes on, gets altogether used up and is enclosed within the chick (so that ten days after hatching, if one cuts the chick open, there will still be a small piece of the yellow left next to the intestine), but it has become detached from the umbilical cord, and there is nothing in between, but it has been entirely used up.

During the time previously mentioned,[321] the chick sleeps, wakes up, opens its eyes on being moved, and utters a cry; and its heart together with the umbilical cord palpates, as in breathing.

This, then, is the mode of generation from the egg in the case of the birds.

317. This sentence is secluded by many editors.
318. 561^{b}18–19.
319. 561^{b}5–10.
320. 561^{b}4–5.
321. 561^{b}27.

Female birds lay some eggs that are infertile, even ones that result from mating, and when they are brooded on no offspring comes to be. This has been observed especially in the pigeons.

Twin eggs have two yolks. In some the yellows are prevented from comingling by a thin partition provided by the white; others do not have this partition, and the yellows touch each other. Some female chickens lay all twin eggs, and in their case the thing with the yolk has been observed to occur; for a hen has hatched eighteen twin eggs, except those that were wind-eggs. The others were fertile (except that one of the twins is bigger than the other), but the final one was a monstrosity.

6.4
The Pigeons

All the pigeon-like birds—for example, the wood pigeon and the turtledove—lay two eggs, for the most part, three at the most. The pigeon, as was said previously,[322] lays eggs in all seasons; the turtledove and the wood pigeon in spring, not more than twice. The female lays the second ones when those that were laid first have been destroyed; for many females destroy their eggs themselves. It lays, as was said, even three eggs at a time; but it never hatches more than two chicks, and sometimes even only one; the remaining egg is always a wind-egg.

Most birds do not generate anything in their first year. But all birds, once they have started to lay eggs, have eggs (one might almost say) to the end of their life, but in some cases they are not easy to see because of their smallness.

The pigeon, for the most part, lays one male and one female egg, and of these, for the most part, it lays the male one first; and when it has laid it, it leaves an interval of one day, then it lays the second. The male takes its turn of brooding on the eggs in the day, the female at night. The egg laid first gets thoroughly concocted and hatched within twenty days. The mother pierces the egg the day before hatching it. Both parents keep the chicks warm for some time in the same way as they did the eggs. The female is more bad-tempered while rearing the offspring than the male, as are the other animals after giving birth. They lay as often as ten times a year, and some have been observed to lay eleven times, and in Egypt up to twelve. The pigeon mates and is mated in its first year; for it even mates and is mated at six months.

Some people say that the female wood pigeon and the female turtledoves are mated and generate even at three months, producing as a sign the great number of these. They are pregnant for fourteen days, and brood for another fourteen days; in another fourteen days the offspring are such good flyers that it is not easy to catch them.

322. 544b7, 558b11–13.

The wood pigeon, so they say, lives for as long as forty years; the partridges over sixteen. The pigeon, after hatching the offspring, lays eggs again after thirty days. **563ª1**

6.5
The Vulture

The vulture builds its nest on inaccessible rocky cliffs; that is why one rarely sees a vulture's nest or offspring. That is also why Herodotus, the father of Bryson the Sophist, says that vultures come from some other land, unknown to us, saying that a sign of this is that no one has ever seen a vulture's nest, and that vultures suddenly appear in large numbers following along with armies. But though it is difficult to see, nonetheless it has been seen. The vulture lays two eggs.

The other carnivorous birds have not been seen to lay more than once a year; the swallow is the only carnivorous bird that nests twice; if one pricks out the eyes of the swallow's offspring when they are still young, the birds will heal and see later on.

6.6
The Eagle

The eagle lays three eggs but hatches two of them, as said in the verses ascribed to Musaeus: "The eagle lays three eggs, hatches two, and cares for one." So this is in fact what happens in most cases; but three chicks have been observed [in a nest]. The mother ejects one of the two chicks as they grow, wearied by feeding them. It is also said that she goes without food at this same time, in order that she not carry off the offspring of wild beasts; thus, her talons get distorted for a few days and her feathers turn white, and as a result mothers become bad-tempered with their offspring at this time. The bearded vulture[323] takes and brings up the chick that has been ejected.

The eagle broods on the eggs for around thirty days. For the other large birds the period of brooding is about the same—for example, the goose and the bustard; for medium-sized ones—for example, the kite and the hawk—it is around twenty days. The kite lays two eggs in most cases, but sometimes it brings up as many as three chicks; the so-called *aigôlios*[324] at times even brings up four. The raven too does not, as some people say, lay only two eggs, but even more; it broods for around twenty days and then ejects the chicks. Other birds do this same thing too; for often those that lay several eggs eject one chick. **563ᵇ1**

Not all the eagle kinds[325] are the same way as regards the offspring. The white-tailed eagle is bad-tempered, but the black eagles are kind to their offspring as regards

323. $619^{b}34–620^{a}12$.
324. Probably a sort of owl ($592^{b}11$, $616^{b}25$).
325. 9.32.

nourishment, though (one might almost say) all the crook-taloned birds, as soon as their offspring are able to fly, expel them from the nest by striking them blows. And of the other birds, as was said,[326] pretty much the majority do this, and, having nourished their offspring, take no further care whatever of them afterward, except the crow; this bird takes care of them for some time; for even after they can fly, she feeds them while flying alongside them.

6.7
The Cuckoo and the Hawk

The cuckoo[327] is said to come from a hawk undergoing a change, because the hawk, which it resembles, disappears around this time; and indeed it is pretty much impossible to see the other hawks as soon as the cuckoo calls, except for a few days. The cuckoo appears for a short time in summer and disappears in winter. But the hawk is crook-taloned, while the cuckoo is not crook-taloned; further, around the head, it does not resemble the hawk either. In both these respects it is more like the pigeon. It is only in color that it resembles the hawk, except that the variegations of the hawk are like lines, those of the cuckoo like points. However, it size and its flight are much the same as those of the smallest of the hawks, and this bird does disappear, for the most part, at the time that the cuckoo appears, although both have been seen together. Also, a cuckoo has been seen being eaten by a hawk; and yet none of the birds of the same kind does this.

They say too that no one has ever seen cuckoo chicks. The cuckoo lays eggs, but does not build a nest. Sometimes it lays them in the nest of the smaller birds, after eating their eggs, especially in the nests of the wood pigeons, after eating their eggs too. It seldom lays two, most often one. It also lays eggs in the nest of the *hupolais*, which hatches and rears the chicks. It is most of all in this season that the cuckoo becomes fat and sweet-fleshed. The chicks of hawks also become very sweet-fleshed and fat. One kind of them builds nests far off and in precipitous rocks.

6.8
Brooding

With most birds, as was said about the pigeons,[328] the male and the female are brooding on the eggs alternately, but in some cases only for the time when the female leaves the nest to get nourishment for itself. Among the geese, only the females brood on the eggs, and they remain sitting on them throughout the entire thing, once they have started doing this.

326. 563ᵇ3–4.
327. 9.29.
328. 562ᵇ17–18.

The nests of all marsh birds are built in marshy and grassy places; which is why, while sitting quietly on the eggs, the birds can get some nourishment for themselves and not go entirely without food.

Among the crows too the females alone brood on the eggs and remain on them throughout the entire thing; the male nourish the females, bringing the nourishment to them and feeding them. Among the wood pigeons, the female starts in the afternoon and broods the whole night until breakfast time; the male does so the rest of the time.

The partridges make two compartments [in their nests] for their eggs, and the female broods on one lot and the male on the other; and, after hatching, each brings up its own. But the male, when he first brings out the chicks, mates with these.

6.9
The Peafowl

The peacock lives for around twenty-five years, and generates at around three years, in which time its feathers also take on their variegation. Hatching occurs in thirty days or slightly more. It lays eggs only once a year; it lays twelve eggs or slightly fewer; it lays them at intervals of two or three days, not continuously; females laying eggs for the first time lay around eight eggs. The peahen also lays wind-eggs. They are mated in spring and give birth immediately after mating. It molts at the same time as the first trees shed their leaves and starts to regain them again at the same time as these **564b1** begin sprouting. Breeders put the eggs of these birds under a female chicken to brood on, because the male, in flying onto the female when she is doing so, crushes them; it is due to this cause too that the females of some wild birds escape from the males to lay and hatch their eggs. At most two eggs are put under the female chicken; for she is able in brooding to hatch only this many. They take care that she does not get down off the eggs and interrupt the brooding, by providing her with nourishment.

The male birds, at mating time, have noticeably larger testicles,[329] and the ones that mate frequently more noticeable so (for example, the male chickens and partridges), in those that do no mate continuously, less.

6.10
The Fishes and the Selachians (1)

As regards the birds, then, this is the mode of pregnancy and generation. As for the fishes, that they are not all egg-laying was said previously.[330] For the selachians are live-bearing, while the kind consisting of the other fishes is egg-laying. The selachians

329. Reading ἐπιδήλως.
330. 489b1–6, 511a3–5.

are live-bearing, but are internally egg-laying beforehand, and nourish the offspring internally, except for the fishing frog.

The fishes also have, as was said above,[331] different uteruses; for the egg-laying fishes have a uterus that is divided in two and low down; the selachians have one like that of the birds. But it differs from the uterus of the birds in that in some cases the eggs are not composed near the diaphragm, but in the middle[332] along the spinal column; as they grow they change place from there.

The egg of all the fishes is not two-colored but single-colored, and are more white than yellow, both beforehand and also when the offspring is inside. The generation from the egg of the fishes and that from the egg of the birds differ, in that the former does not have the one of the two umbilical cords that extends to the membrane under the shell. Of the two ducts, it does not have the one that, in the birds, extends to the yellow. The rest of the generation from the egg is then entirely the same in the case of the birds and of the fishes; for it occurs at the extremity of the egg, and the blood vessels extend from the heart in the same way at first, and the head, the eyes, and the upper parts are the largest at first. In both cases it is the same way: as the fetus grows
565ᵃ1 the egg always becomes smaller, and in the end disappears and goes inside it, just as in the birds the so-called chick[333] does.

The umbilical cord is attached, a little below the mouth, to the abdomen.[334] When the fetuses are young, the umbilical cord is long, but as they grow it shortens, and in the end is small, until it goes inside, as was said in the case of the birds.[335] The fetus and the egg are encompassed by a common membrane; beneath this there is another membrane, which encompasses the embryo and is special to it; between the two membranes there is a liquid. And nourishment is present in the stomach of the small fishes, just as in those of the chicks, one part of it white, the other yellow.

As for the shape the uterus has, one must observe it in the *Dissections*. It differs from one fish to another—for example, in the shark-like fishes, among themselves and in relation to the broad ones. For in some the eggs attach in the middle of the uterus around the spinal column, as was said[336]—for example, the puppies;[337] and as they grow they move around. Since the uterus is divided in two, and is attached to the diaphragm, as in other animals of this sort, the eggs move around into one or other of the two parts. The uterus—both in this fish and in the other shark-like fishes—has, a little further on from the diaphragm, entities like white breasts, which do not appear if no embryos are present in it.

331. 511ᵃ5–8.
332. 565ᵃ15.
333. The yolk (562ᵃ12).
334. Reading τῇ γαστρί.
335. 562ᵃ5–17.
336. 564ᵇ22.
337. 565ᵇ26.

The puppies and the rays have shell-like entities, in which an egg-like liquid appears. The shape of this shell is like the reeds in a pipe, and there are hair-like ducts attached to the shells. In the case of the puppies, which some call the "spotted" sharks, the offspring come to be when the shell breaks open and falls; in the case of the rays, when they have laid eggs, the offspring comes to be after the shell breaks open. The spiny shark has the eggs up against the diaphragm, above the breasts; when the egg descends, as soon as it gets detached, the offspring comes to be. Generation also occurs in the same way in the case of the fox sharks.[338] **$565^{b}1$**

The so-called smooth sharks have their eggs in the middle of the uteruses in the same way as the puppies and, moving around into each of the two parts of the uterus, they descend. The animals come to be with the umbilical cord attached to the uterus, so that as the eggs get used up the condition of the fetus seems like that of the four-footed animals. The umbilical cord, which is long, is attached to the uterus at its lower part (each one being, as it were, fastened to a cotyledon) and to the fetus in the middle, where the liver is situated. The nourishment present when the fetus is cut open, even if it no longer contains the egg, is egg-like. A chorion and the membranes special to it occur in each fetus, just as in the four-footed animals. The fetuses, when young, have their head upward, but as they mature and reach completion, downward. On the left side, males come to be; on the right, females; and on the same side, males and females together. The fetuses, when cut open, are the same way as in the case of the four-footed animals: all the viscera they have are large—for example, the liver—and full of blood.

All the selachians at the same time have many eggs in the upper part near the diaphragm (some larger, some smaller) and fetuses already lower down; that is why many people think that these sorts of fishes lay eggs and mate each month, because the offspring are not all released at the same time, but often over a long period. But those that are down below in the uterus are concocted and brought to completion at the same time.

The other sharks can release and take into themselves their offspring, also the angelfishes and the torpedo fishes (a large torpedo fish has been observed with around eighty fetuses inside it), while the spiny shark, alone among the sharks, does not take them in, due to its spine.

Among the broad selachians, the stingray and the ray do not take them in, due to the roughness of their tail. The fishing frog also does not take them, due to the size of its head and its spines; indeed, it is also the only one of these fishes that is not live-bearing, as was said previously.[339]

This, then, is the mode of difference between these fishes themselves and of their generation from their eggs. **$566^{a}1$**

338. Also $566^{a}31$.
339. $564^{b}16$–18.

6.11
The Selachians (2)

The males, around the time of mating, have their ducts so full of seminal fluid that, when they are squeezed, the seed flows out white. The ducts, which have two parts, have their starting-point at the diaphragm and the great blood vessel. Around this time the ducts of the males are already distinguishable from the uterus of the females; when it is not this season, they are less distinguishable to one not accustomed to them; for in certain cases and at certain times these are altogether invisible, as was said concerning the testicles of the birds.[340]

The spermatic ducts and the uteruses also have other differences from each other: the former are attached to the loin, while the ducts of the females are easily moved and fasted only by a thin membrane. The way the ducts of the males are must be also observed with the help of the diagrams in the *Dissections*.

The selachians are subject to superfetation, and the female is pregnant for six months at the most. The ones that give birth most often are the so-called starry sharks; for it gives birth twice a month. They start to mate in the month of Maemacterion.[341] The other sharks give birth twice a year, except the puppy: this one does so once a year. Some of them give birth in spring; the angelfish also does so a second time in fall near the winter setting of the Pleiades; the first one is in spring; the second set of offspring thrives much more than the first. The torpedo fish gives birth in the late fall.

The selachians give birth near the shore after coming in from the high sea and the depths, for the sake of the warmth and because of fearing for their offspring.

Among the other fishes none is ever seen copulating outside its own kind, only the angelfish (*rhinê*) and the ray (*batos*) seem to do this; for there is a fish called a *rhinobatos*;[342] for it has the head and front parts of the ray, and the back parts of the angelfish, as if coming from both of these.

The sharks and the shark-like fishes (for example, the fox shark and the dogfish) and the broad fishes (for example, the torpedo fish, the ray, the smooth ray, and the sting-
566[b]1 ray) give birth in the mode mentioned:[343] they are live-bearing after being egg-laying.

6.12
The Cetaceans and the Seal

The dolphin, the whale, and the other cetaceans—whichever ones have no gills but rather [blowhole] pipes—are live-bearing; further, the sawfish and the ox fish; for it is evident that none of these has eggs, but from the outset have an embryo, from

340. 509[b]29–32.
341. Mid-October–mid-November.
342. The common guitarfish.
343. 564[b]16–18.

which, once articulated, the animal comes to be, just as in the human being and the live-bearing four-footed animals.

The dolphin more often gives birth to one offspring, but sometimes two; the whale to two at most and more frequently, or else to one. The porpoise does so like the dolphin; for, in fact, it is like a small dolphin; it occurs in the Black Sea. But the porpoise differs from the dolphin; for it is smaller in size and broader across the back; it has a dark blue color. Many people say that the porpoise is one kind of the dolphins.

All animals that have a pipe[344] exhale and take in air; for they have a lung. And a dolphin, at any rate, has been observed, when it was sleeping, with its snout above water, snoring in its sleep.

The dolphin and the porpoise have milk and suckle; and they take their offspring inside them when they are small. The offspring of the dolphins grow rapidly; for in ten years they reach their final size. The mother is pregnant for ten months. The dolphin gives birth in summer, and in no other season whatever. As it happens, it even disappears at the time of the Dog Star for around thirty days. Its offspring follow along with it for a long time; in fact, the animal is child-loving. It lives for many years; for some have been clearly seen to have lived for over twenty-five years, others for thirty; for fishermen cut the tails of some of them and then let them go, so that in this way they know their ages.

The seal is one of the animals that play a double game; for it does not take in water, but breathes, sleeps, and gives birth on land (but near to the shore), as if it were a terrestrial animal. It spends most of its time, however, and gets its nourishment from the sea; that is why it must be spoken about with the aquatic animals. It is internally live-bearing from the outset, gives birth to live offspring, and ejects a chorion and the rest like a sheep. It gives birth to one, two, or at most three **567^{a}1** offspring. It has two breasts and suckles its offspring like the four-footed animals. It gives birth, like the human being, in all seasons of the year, but especially when the first goats are born. When its offspring are around twelve days old, it leads them into the sea many times each day, accustoming them to it little by little. They go down steep places, but they do not walk, because they are not able to lean on their feet. The seal can draw itself together and contract itself; for it is fleshy and soft and has cartilaginous bones. It is difficult to kill a seal by force, unless one strikes it on the temple; for its body is fleshy. It emits a voiced sound like that of a cow. The female has a sex organ that is like that of a sheep,[345] but all the rest is like a woman's.

As regards the aquatic animals that are either internally or externally live-bearing, then, this is the mode of generation and giving birth.

344. I.e., a blowhole.

345. The mss. βατίδι ("like that of a ray") is probably corrupt.

6.13
The Egg-Laying Fishes

The egg-laying fishes have a uterus that is divided in two and low down, as was said previously[346] (the soft-scaled fishes are all egg-laying—for example, the bass, the mullet, the gray mullet, and the *etelis*, and all the so-called whitefishes, and the smooth ones except the eel), and the egg they have is crumbly. Its appearing so is due to the fact that the entire uterus is so full of eggs that in the small fishes there seem to be only two eggs;[347] for because of its smallness and thinness the uterus is invisible in these fishes.

The mating of all the fishes was spoken about previously.[348]

In most of the fishes there are males and females; but about the erythrinus and the channa there is a puzzle; for all of those when caught contain embryos.[349]

In the fishes that copulate eggs are composed when mating, but they have them without mating too. Some of the river fishes show this clearly; for immediately after being born (one might almost say) and while still small, the minnows contain embryos.

These fishes shed their eggs and, as is said, the males gulp down most of them, while others are destroyed in the water; but those that they lay in the places where they should lay them are saved; for if all of them were saved, the kind of each of them would be altogether vast in number. Also, many of these eggs are not fertile, but only those that the male sprinkles with his seminal fluid; for when the eggs have been laid, the male follows and sprinkles his seminal fluid on the eggs, and from all those sprinkled small fishes come to be, and from the others as luck would have it.[350]

The same thing occurs in the case of the soft-bodied animals. For the male of the cuttlefishes, when the female has laid the eggs, sprinkles them; and it is reasonable to suppose that this same thing is precisely what happens in the case of the other soft-bodied animals as well, but it has been observed only in the case of the cuttlefishes up to the present.

The fishes lay their eggs near the land. The gobies do so near stones; what they lay, however, is flat and crumbly. The other fishes do likewise; for the places near the land are warm and contain more nourishment, and there the embryos are not eaten up by the larger fishes. That is also why in the Black Sea, it is near the mouth of the river Thermodon that most fishes lay their eggs; for this place is without wind, warm, and has fresh water.

346. 564b19–20.
347. 510b24–27.
348. 540b6–15.
349. 538a18–21.
350. I.e., they might not be directly sprinkled on and yet get fertilized.

The other egg-laying fishes lay once a year, with the single exception of the small *phukis*.[351] The male *phukis* differs from the female in being blacker and having larger scales.

The other fishes lay when in seed[352] and emit the eggs; but the fish that some people call the "pipefish," when the time to lay eggs comes, bursts open, and in that way the eggs emerge. For this fish has a sort of partition under the abdomen and the lower abdomen, just like the blind snakes; when it has laid its eggs, the sides grow back together again.

Generation from the egg occurs in the same way in the internally and externally egg-laying fishes; for the embryo comes to be at the extremity of the egg and is encompassed by a membrane, and first to be distinguished are the eyes, large and spherical. This shows clearly that it is not the case, as some people say, that fish embryos develop in the same way as those that come about from larvae; for in the case of those it occurs in the contrary way: the lower parts are larger at first, and the eyes and the head develop later. When the egg has been used up, they become tadpole-like, and at first, though taking no nourishment whatever, they grow from the liquid appearing in the egg; later on, they are nourished by the river water until they are grown. **568ª1**

When the Black Sea is being purged, something they call *phukos* is carried into the Hellespont; it is yellow. Some say that this is the bloom of the *phukos*, from which *phukion*[353] comes. It occurs at the start of summer. By this the oysters and the small fishes in these places are nourished. Some of the seamen even say that the purpura gets its bloom from this.[354]

6.14
The Freshwater Fishes

Marsh fishes and river fishes have embryos at the age of five months, for the most part, and all of them lay their eggs at the end of their first year. Like the sea fishes, these never emit all at the same time, neither the females the egg nor the males the seminal fluid, but the former more or less always have eggs and the latter seminal fluid. They lay eggs in the normal season: the carp five or six times (for it mostly lays its offspring at "the stars"[355]); the *chalkis*[356] lays eggs three times; all the others once a

351. Perhaps the black goby.
352. Reading ἐν γόνῳ.
353. A sort of rouge.
354. $547^{a}4$–$^{b}1$.
355. The phrase "at the stars (*epi tois astrois*)" occurs again at $600^{a}3$. The reference is probably to the risings of the Pleiades, Arcturus, and the Dog Star.
356. Perhaps the shad. There is also a saltwater fish with the same name ($535^{b}18$).

year. They all[357] lay in the stagnant pools left by overflowing rivers and near the reedy parts of marshes—for example, the minnow and the perch.

The sheatfish and the perch emit a continuous embryo, like the frogs; the coiled up embryo is so continuous that—at any rate, in the case of the perch—fishermen in the marshes can unwind it from the reeds because of its breadth. The larger sheatfish lay their eggs in deep waters, some in water a fathom deep; the smaller ones in shallower waters, mostly near the roots of the willow or some other tree, and also near reeds or near moss. Sometimes these fishes intertwine with each other, a very large one with a small one, and bringing the ducts next to each other, which some call "umbilical cords," through which the seed is emitted, one lets out the egg, the other
568ᵇ1 the seminal fluid. All the eggs that get mixed with seminal fluid appear whiter and larger from the outset—in a day, so to speak. A short time later the fish's eyes become clearly visible; for in all the fishes, just as in all the other animals too, they are what is most noticeable from the outset and appear largest. All the eggs that the seminal fluid does not touch, just as in the case of the sea fishes too, are useless and infertile. From the fertile eggs, as the small fishes grow, a sort of sheath detaches itself; this is a membrane that encompasses the egg and the small fish. When the seminal fluid mixes with the egg, the composition that results from these becomes very sticky and sticks to the roots or wherever the fishes have laid. Where they have laid the most, the male keeps egg-guard, while the female, having laid, goes away.

Growth from the egg is slowest in the case of the sheatfish,[358] which is why the male keeps watch for forty or fifty days, in order that the embryo not be eaten by the little fishes that happen to pass by. Second in slowness is the generation of the carp; nonetheless, when the embryo even of these is saved, it escapes quickly. In the case of some of the smaller [kinds of] fishes, even in three days, they are already small fishes. The eggs grow when touched by the seminal fluid, both on the same day and yet later. The egg of the sheatfish is as large as a seed of bitter vetch; that of the carps and fishes of this sort is as large as a millet seed.

This, then, is the modes in which these fishes lay eggs and generate offspring. The *chalkis*, however, lays eggs in deep waters, crowded together and living in herds. The fish they call the *tilôn* lays them near beaches in spots sheltered from wind; this one is also a fish that lives in herds. The carp, the *beleros*,[359] and (one might almost say) all the other fishes crowd into shallow waters in order to give birth, with one female often followed by thirteen or fourteen males. When the female emits the egg and goes away, the ones following after her sprinkle it with their seminal fluid. Most of the eggs are destroyed; for because the female lays it and goes away, the eggs—those
569ª1 that are not carried off by the current and do not strike against something solid—get scattered; for, apart from the sheatfish, none of the other fishes guards its eggs, except,

357. Cf. 568ᵇ24.
358. 621ª21–ᵇ2.
359. Probably a sort of carp.

if it happens upon a mass of its own seed, the carp. People say, though, that it guards its eggs.

All the male fishes have seminal fluid, except the eel; it has neither egg nor seminal fluid.[360] The mullets go up from the sea to marshes and rivers; eels, on the contrary, go from these into the sea.

6.15
Spontaneous Generation among the Fishes

The great majority of the fishes, as was said,[361] come to be from eggs. Nonetheless, there are some that come to be from mud and from sand, even of those kinds that come to be from copulation and eggs. This occurs in lakes and other places, like the one, they say, there was once around Cnidus, which was drying up at the time of the Dog Star, and all the mud was removed; water was starting to appear when the rains were coming. In it small fishes appeared as soon as the water was starting. They were a kind of mullet that did not come to be from mating at all, about the size of a small sprat; none of these contain either any egg at all or seminal fluid. In rivers in Asia too, which do not flow into the sea, other small fishes, about the size of those boiled for eating, come about in the same mode as these. Some people say that all mullets spring up in this way, but they are not correct; for females of these are also seen to contain eggs and males to contain seminal fluid. But there is a kind of mullet that springs up from mud and sand.

That some fishes come to be spontaneously, then, neither from eggs nor from mating, is evident from these cases. Those that are neither egg-laying nor live-bearing all come to be in some cases from mud, in some from sand, and from the putrefying on the surface—for example, the so-called foam (*aphros*) of fry comes to be from sandy earth. This fry (*aphuê*) never grows and is infertile, and after a certain amount of time, it is destroyed, and another springs up again. That is why, apart from a short period **$569^{b}1$** of time, it comes to be (one might almost say) in every season; for it lasts from the rising of Arcturus in the fall[362] until the spring. A sign that this fry sometimes comes up from the ground is that, when fishing, if the weather is cold, it is not caught, but if it is warm, it is caught, suggesting that it comes up from the earth for the heat. Also, when in dredging, the earth is being scraped up several times, the fry come to be in larger numbers and are of better quality. The other sorts of fry are of poor quality because of the rapidity of their growth.

The fry come to be in shaded and marshy places, when, after good weather has occurred, the earth is warming up—for example, in the neighborhood of Athens, at Salamis, and near the tomb of Themistocles, and at Marathon; for in these places the

360. 6.16.
361. 6.13–14.
362. Mid-September.

foam of fry occurs. It appears, then, in places of this sort and in good weather of this sort, but in some places when there is a lot of rain it also occurs in the foam produced by the rainwater, which is why it is called a "foam." {Sometimes too, when there is good weather, it is carried in on the surface of the sea, in which it collects; like larvae do in dung, so this does in the foam [of the sea], where it is composed on the surface; that is why this fry is often brought in from the deep sea. And the fry thrive and are caught in the largest numbers when the year is wet and warm.}[363]

The other sort of fry is the offspring of fishes: the so-called gudgeon fry is the offspring of the gudgeons that are small and of poor quality, the ones that burrow under the earth; from the Phaleron fry comes the *membras*, and from these the *trichis*, from the *trichis* the *trichias*, and from one sort of fry—for example, the one in the harbor of Athens, comes what is called the *egkrasicholos*.[364] There is also another sort of fry which is the offspring of the small sprats and mullets.

The infertile foam is watery and lasts only a short time, as was said previously;[365] for in the end a head and eyes are all that remain. However, fishermen have now found a way of transporting it; for when salted it keeps a longer time.

6.16
The Eels

The eels do not come to be from mating nor are they egg-laying, nor has one ever been caught which had either seminal fluid or eggs, nor when opened up do they contain seminal or uterine ducts. In fact, this whole kind of blooded animals comes to be neither from mating nor from eggs. It is evident that this is so; for in certain marshy pools, after all the water has been drained off, and the mud scraped out, the eels come to be again, when rainwater occurs; in droughts, on the other hand, they do not come to be, not even in stagnant pools; for in fact they live and are nourished by rainwater. It is evident, then, that they come to be neither from mating nor from eggs.

It seems to some people, though, that they do generate, because in some eels small worms appear; for they think that eels come to be from these. But this is not true: they come to be from the so-called entrails of the earth, which get composed spontaneously in mud and humid earth. In fact, eels have been observed emerging from these, and become visible when incisions are made and they are divided. Worms of this sort also occur in the sea and in rivers, especially when there is putrefying material: in the seas near the sort of places where there is seaweed; in rivers and mashes near their edges; for there the heat, being strong, causes putrefaction.

This, then, is the mode of generation of the eels.

363. Secluded by many editors as spurious.
364. The anchovy.
365. The reference seems to be to 569ᵇ1, but there a different point is made.

6.17
When Offspring Come to Be

The fishes do not all give birth in the same season or in the same way, nor are they pregnant for the same length of time. Before mating herds of males and females are formed, but when it is time for mating and giving birth, they form couples. Some fishes are pregnant for no more than thirty days, others for a shorter time; but all of them do so for a number of days divisible by seven. Pregnant for the longest time is the fish some people call the *marinos*. The sargus becomes pregnant around the month of Poseideon,[366] and is pregnant for thirty days. The mullet that some call **570^{b}1** the *chelôn*, and the *muxôn*, are pregnant in the same season and for same length of time as the sargus.

All the fishes suffer during pregnancy, that is why it is especially during this time that they are cast ashore; for, maddened by the pain, they get carried toward the land. And, in general, they continue to be in movement during this time, until they have laid their eggs. Among the fishes, it is especially the mullet that does this. When they have laid their eggs, they find rest. For many fishes there is an end to their pregnancy when larvae spring up in their abdomen; for certain small animate entities spring up and drive out the fetuses.

Offspring come to be in spring by the fishes that go in shoals with the current, and by most of them around the time of the spring equinox (by the other fishes, though, not in the same season of the year, but some in summer, others around the time of the fall equinox). The first of this sort of fish to lay eggs is the *atherinê*[367] (it lays them close to the land). The gray mullet is last; this is clear from the fact that the offspring of the former appear first, that of the latter last. The mullet is also among the first to lay eggs; the saupe does so mostly at the start of summer, but in some places in fall. The *aulôpias*, which some call the *anthias*,[368] also lays eggs in summer. After these are the gilthead, the bass, the *mormuros*, and, in general, the so-called migratory fishes.[369] Last among the fishes that live in herds are the red mullet and the sea crow;[370] these lay their eggs toward fall. The red mullet lays its eggs in the mud; that is why it lays them late; for mud stays cold for a long time. The sea crow lays eggs later than the red mullet, going out into the seaweed to do so, because it lives in rocky places; it is pregnant for a long time. The *mainis*[371] lay their eggs after the winter solstice. Among the others, the deep-sea dwellers mostly lay their eggs in summer; a proof of this is that they are not caught during this time.

366. Mid-November–mid-December.
367. Probably the sand smelt.
368. $620^{b}34$–$621^{a}2$.
369. $488^{a}6$.
370. Probably *Umbrina cirrosa*.
371. A Mediterranean variety of small sprat.

The most prolific of the fishes is the *mainis*, and of the selachians, the fishing frog (but these [fishes] are rare because [their eggs are] easily destroyed; for the eggs are laid in a mass and near the land). In general, the selachians are less prolific than the other fishes because they are live-bearing, but it is their offspring that mostly survive because of their size.

Also late in laying eggs is the so-called pipefish, and most of these, before laying them, burst open due to the eggs, which are not so much many in number as large in size. And like the venom-spiders, the offspring are crowded around the mother pipefish too; for she lays the eggs on herself; and if one touches them, they flee. The *atherinê* lays her eggs by rubbing her stomach against the sand.

The tunas burst open too, due to their fat. They live for two years. A sign of this is produced by the fishermen; for once when the young tunas failed to appear one year, the next year the adult tunas also failed to appear. It seems that these are a year older than the young tunas.

The tunas and the mackerel mate around the end of the month of Elaphebolion[372] and they lay eggs around the start of Hecatombaeon;[373] the eggs are laid in a sort of sac. The growth of the young tunas is rapid; for after the fishes have laid the eggs in the Black Sea, there comes from the egg what some people call *skordulai*, and the Byzantines call "growers (*auxidai*)," because of their growing (*auxanesthai*) within a few days; these leave in fall along with the female tunas, and return in spring, by which time they are already young tunas. Pretty much all the other fishes also grow rapidly, and all those in the Black Sea more rapidly still; for from day to day, in fact, the bonitos very noticeably grow.

In general, it is necessary to recognize that the same fishes, when not in the same places, do not have the same season either for mating, for pregnancy, for giving birth, or for good weather; thus, the so-called sea crows sometimes lay eggs around the time of the wheat harvest. What has been said, though, is aimed at stating what happens for the most part.

The conger eels also have embryos; but this is not equally noticeable in all places, nor, because of the fat, is the embryo very evident; for it appears elongated, as in the snakes.[374] But putting the eel on the fire makes it distinguishable; for the fat gets burned and melts, while the embryos jump around and make a noise when they explode. Further, if one touches it and rubs it in one's fingers, the suet feels smooth, the egg rough. Some of the conger eels have suet but no eggs, others, on the contrary, have no suet, but have an egg of the sort described just now.

372. February–March.
373. Mid-June–mid-July.
374. 558ᵇ1–2.

6.18
The Live-Bearing Terrestrial Animals: Horses, Cows, and Pigs

As regards the various animals that fly and swim, then, and as regards the terrestrial ones that are egg-laying, and about pretty much all of them, the mating, pregnancy, and other things similar to these have been spoke about. As regards all the terrestrial animals that are egg-laying, however, and as regards the human being, the corresponding things must now be stated in the same way. As regards mating, it was stated what is special and what is common to all.

Common to all the animals is to be excited by appetite and pleasure, especially those stemming from mating. The female animals are most bad-tempered just after they give birth, the males at mating time; for stallions bite other stallions and throw and chase their riders. But boars are the most bad-tempered—even though they are weakest at this time, due to mating—and engage in wondrous battles with each other, covering themselves in defensive armor and making their skin as thick as possible in preparation, by rubbing themselves against trees and repeatedly wallowing in mud and then drying themselves. They fight each other, driving each other from the herd in so violent a way that often they both get killed. Likewise, the bulls, the rams, and the male goats; for although beforehand they herd together, at mating time they fight and are at variance with each other. The male camel is also bad-tempered at mating time, if a human being or another camel comes near him; [and more when a horse does,] for it generally always fights with horses.

It is the same way in the case of the wild beasts; for the bears, the wolves, and the lions are bad-tempered with those who come near them at this time, though they fight less with each other, because none of these sorts of animals lives in herds. The female bears are also bad-tempered after giving birth to cubs, just as female dogs are after giving birth to pups.

The male elephants also become savage at mating time; that is why they say that in India the elephant keepers do not allow them to mate with the females; for they become so maddened at these times that they overturn their keepers' houses (since they are poorly built) and do a lot of other damage. They say too that an abundance **572^{a}1** of nourishment makes them tamer. Also, by introducing other elephants among them, they punish them and make them subject to themselves by commanding the ones introduced to strike them blows.

The animals that mate frequently and not at one season only—for example, those that live among human beings, such as pigs and dogs—are less evidently like this because of the frequency of their sexual intercourse.

Among the female animals, the most eager for copulation is the female horse, then the female cow. Female horses, indeed, are "mad-for-a-stallion (*hippomanein*)." (That is why, for purposes of defamation, their name is transferred from this one animal to those women who lack self-control as regards sexual intercourse.) They are also said to get impregnated by the wind around this time; that is why in Crete they never take

the mating males away from the females. When they are in this condition they run away from the other horses. (This is precisely the condition that, in the case of female pigs, is said to be "wanting the boar (*kaprizein*)".) And they run neither to the east nor to the west, but either to the north or to the south. When this condition occurs, they allow no one to come near them until they lose heart due to the exertion or reach the sea; at that point they expel something, like that found on the offspring they give birth to, which they call *hippomanes*.[375] It is like the sow-virus (*kapria*),[376] and the sorceresses seek it most of all.[377]

In mating season, the female horses huddle next to each other more than before, move their tail continuously, and emit a voiced sound quite other than at the rest of the time. A liquid flows from their sex organ that is like semen, but much finer-grained than that of the male; some people call this *hippomanes*, and not the one adhering to the foals. They say it is difficult to get; for it flows in small quantities. Also, they urinate frequently when they are in heat, and play with each other.

As regards the female horses,[378] then, this is the mode.

Female cows "want the bull," and are so violently possessed by this affection that the herdsmen are unable to control them or even to catch hold of them. Both female horses and female cows show it clearly when they are eager to mate by the swelling of their sex organs and—the female cows just like the female horses—by frequent urination. Further, the female cows mount the bulls and are always following them and standing beside them. The younger ones are the first to be eager for mating, both among the horses and among the cows; and when the weather is good and their bodies are in good condition, they are more eager.

When female horses are shorn, their impulse lessens and they become dejected. The male horses recognize the females of their herd by their odors, even if they have been together for only a few days before mating; and if others get mixed in with these, they bite them and drive them out. The males graze apart, each with his own females. Each is given around thirty females, or slightly more. When some male approaches, he assembles the females into the same compact body by running around them in a circle, then goes to do battle; and if one of them makes a movement, he bites and prevents her.

The bull, when it is mating season, begins to herd together [with the females] and fight other males (while beforehand they were together with each other); this is called "forsaking the herd": for often in Epirus, at any rate, bulls are not seen [in the herd] for three months.

In general, all or most males do not herd together with the females before mating season, but keep separate when they have reached maturity, and the males and the females feed apart.

375. 577[a]9, 605[a]2.
376. 573[b]2; ovaries at 632[a]21.
377. 577[a]12–13.
378. Reading τὰς ἵππους.

The female pigs too, when they are eager for mating (which is called "wanting the boar"), will thrust themselves even against human beings. In female dogs this sort of affection is called "being in heat."

A swelling of the sex organs occurs in the females when they are eager for mating and there is wetness around that place. Female horses squirt out a white liquid at this time.

Purgations of the menses occur in the females, but not to the same extent in any of the other animals as in women. In the sheep and the goats, when it is mating season, these appear as signs before mating; when they have mated, the signs still appear, then they cease for an interval, until they are about to give birth. Then they appear as signs again, and this is how the shepherds know that they are close to giving birth. When **573ª1** a female has given birth, the menses become copious; at first, it is not very bloody. Later on, however, it is very bloody. In the female cow, the female ass, and the female horse it is more copious because of their size, but in proportion to their size much less copious; thus the female cow, when eager for mating, is purged of a small quantity of menses, about a half-*cotyle* or a little less. The most opportune time for mating is when this purgation occurs. Among all the four-footed animals, the female horse gives birth most easily, best purges the postnatal discharges, and emits the least flow of blood, in proportion to the size of the body.

In the female cows and the female horses menses mostly appear at intervals of two, four, and six months; but it is not easy to discern without accompanying the animal and being very accustomed to it; that is why some people think that it does not occur in these animals.

In female mules menses do not occur at all, but the female's urine is more coarse-grained. In general, the residue from the bladder in the four-footed animals is more coarse-grained than in that of the human beings; in the sheep and the goats that of the females is even more coarse-grained than that of the males; but in the asses that of the females is finer-grained; that of the female cow is more acrid. After giving birth the urine of all the four-footed animals becomes more coarse-grained, especially in those whose purgation of menses is less.

The milk, once mating starts, becomes pus-like, but becomes usable after giving birth. When they are pregnant, both the sheep and the goats become fatter and eat more; the cows and all the other four-footed animals do the same thing.

The animals (one might almost say) in every case are more eager for mating in the season of spring; however, the time for mating is not the same for all, but is related to the appropriate times for the nourishment of offspring.

Tame female pigs are pregnant for four months and give birth to twenty offspring at the most; except that if they give birth to a lot, they are not able to rear them all. As they grow older, they continue to give birth in the same way, but are slower to mate. They conceive from a single mating, but they put the boar to the female pig many times, because after mating she discharges what some people call the "sow-virus." This happens **573ᵇ1** to all female pigs, but some emit the seed along with this. During pregnancy any one of

the offspring that gets damaged and deformed in respect of size is called an "after-pig"; this can occur in any part of the uterus. When the female pig has given birth, she gives her primary breast[379] to the first one.

When the female pig is in heat, she should not be put to the male immediately, not until she has dropped her ears; otherwise she gets in heat again; but if she is put to the male when she is eager, a single mating, as was said,[380] is enough. It is good to give the boar barley when he is mating, and boiled barley to the female pig when she has given birth. Among female pigs, some generate fine pigs only at the outset; others, as they grow, generate good offspring, that is, good piglets. Some people say that if the female pig has one of her eyes knocked out, she—for the most part—dies quickly. Most female pigs live for around fifteen years, but some reach a little short of twenty.

6.19
The Sheep and the Goats

Ewes conceive after three or four matings, but if it rains after the mating, they miscarry. It is the same with female goats. Most ewes give birth to two offspring, sometimes even three or four. Both the ewe and the female goat are pregnant for five months; that is why in some places that are warm and in which they thrive and have abundant nourishment, they give birth twice a year.

The goat lives for around eight years, the sheep around ten, though the majority live for less, except the leaders of the sheep; these even live for fifteen years. (In each flock they establish one of the males as leader. When he is called by name by the shepherd, he takes the lead. They accustom them to do this from an early age.) The sheep in Ethiopia live for twelve or thirteen years, the goats for ten or eleven. Both the sheep and the goat mate and are mated for as long as they live.

Both the sheep and the goats produce twin offspring due to abundant feeding; also, if the ram or the male goat is a twin-producer, or if the mother is. Some generate females, others males due to the water (for some waters are female-generating, some male-generating), and likewise due to the mating: those mated in north winds gen-
574a1 erate more males, in south winds more females. Female-generators can change and become male-generators: they must be faced north when mated. Those accustomed to being mated in the morning, if one tries to mate them in the evening, will not submit to the rams.

The offspring are born white or black in accord with whether the blood vessels under the ram's tongue are white or black: white if they are white, black if they are black; if they are both, both; if they are red, red. The ewes that drink salt water are

379. *PA* 688b8–14.
380. 573a34.

the first to be mated; they must be given salt before they give birth, when they have given birth, and again in spring.

The herdsmen do not establish a leader for the goats, because their nature is not stable, but hasty and changeable.

Among the sheep, if the older ones are eager for mating at the appointed season, the shepherds say that it is a sign of a good year for the sheep; if the younger ones are, that the sheep are in a bad state.

6.20
The Dogs

There are many kinds of dogs. Laconian hounds mate and are mated at eight months. And some dogs are already lifting their leg when urinating around this time. The dog conceives from a single mating; this is especially clear in cases where they mate secretly; for the females get pregnant after being mounted once.

The Laconian hound is pregnant for a sixth of a year (that is, sixty days), or perhaps one, two, or three days more, or one day less. Her puppies are blind when they are born and remain so for twelve days. After giving birth to them, she is ready to be mated again in six months, but not before. Some dogs are pregnant for a fifth of the year (that is, seventy-two days), and the puppies of these dogs are blind for fourteen days. Others are pregnant for a quarter of the year (that is, three whole months); the puppies of these dogs are blind for seventeen days. It seems, though, that the dog is in heat for the same length of time.

Menstruation in dogs lasts for seven days; at the same time swelling of the sex organ occurs. During this time they do not submit to mating, but rather in the seven days following; in fact, all of them seem to be in heat for fourteen days, for the most **$574^{b}1$** part; nonetheless, in some this affection lasts for around sixteen days. The postnatal purgation occurs at the same time as the birth of the puppies. It is coarse-grained and phlegm-like; its quantity, once they have given birth, becomes relatively minimal compared to their body.

The dogs have milk, for the most part, five days before they give birth; in some cases, however, it occurs seven days before, even four. It is usable immediately, once they have given birth. The Laconian hound has milk thirty days after mating. The milk at first is coarse-grained, but as time goes on it gets more fine-grained. Dog's milk is more coarse-grained than that of the other animals, after that of the female pig and the hare.

There is also a sign that a female has reached the age to be mated; for, just as in the case of human beings, a sort of swelling occurs in the nipples of the breasts and these have cartilage in them; nonetheless, it is not work for one not accustomed to it to observe these things; for the sign is of no magnitude.

This is what happens in the female. In the male none of this happens. The males lift their leg when urinating at the age of six months, for the most part. But some do it later, when they are already eight months, others before they are six months; simply speaking, it is when they start to have strength that they do this. The females all urinate sitting down, though some of them have been observed lifting their leg when they urinate.

The dog gives birth to at most twelve puppies; for the most part, five or six; but cases have been observed of a female giving birth to a single puppy. The Laconian hounds, for the most part, give birth to eight. Females are mated and males mate throughout life. A special affection of the male Laconian hounds is that they are more capable of mating after laboring than when they are idle.

The male Laconian hound lives for around ten years, the female for around twelve. Among the others, the females mostly live for around fourteen or fifteen years, some for as many as twenty; that is why some people think that Homer was correct to represent Odysseus' dog as having died in its twentieth year.[381] In the case of the Laconian hounds, because of the laboring of the males, the females are longer-lived than the males. In the case of the other dogs this difference is not very noticeable; the males are, nonetheless, longer-lived than the females.

The dog sheds no teeth except the so-called canines; these both the females and the males shed alike at the age of four months. Because they shed only these, some people dispute about it; for some people, because they shed only two, say that they shed none at all (for it is difficult to hit upon these [being shed]); others, when they do see these [being shed], think that they also shed all the others. People determine the ages of dogs from their teeth; for young dogs have white sharp teeth, while old dogs have black blunt ones.

6.21
The Cows

The male cow impregnates the female from a single mating; he mounts so violently that the female cow gets bent down. If he fails in his assault, the female must be allowed an interval of twenty days before mating again. The older bulls will not mount the same female several times in the same day, unless intervals are left between. The younger ones, by contrast, force themselves on the same female several times and mount many females, because of their vigor. The least lustful of the males is the bull, but it is the victor among the bulls that mates; but when, because of his lustfulness, he has become incapable, the defeated one attacks, and often overpowers him. The males first mate and the females are first mated, so as also to give birth, at one year;

381. *Odyssey* 17.326.

for the most part, however, it is at twenty months; the age most commonly agreed is two years.

The female is pregnant for nine months and gives birth in the tenth; some people confidently affirm that they are pregnant for ten months to the day. What is delivered earlier than the times mentioned is a miscarriage and will not live; for its hooves are soft and incomplete. She mostly gives birth to one offspring, seldom two; she gives birth and mates throughout life.

The females, for the most part, live for around fifteen years; the males too if they are castrated. Some live for twenty years, even more, if they have a healthy body; for in fact herdsmen train the castrated males and establish them as leaders of the herd, **$575^{b}1$** just as in the case of the sheep; these live for a longer time than the others because of not laboring, and because of having fresh pasture to graze on. The male is most in his prime at five years; that is why some people say that Homer is correct to speak of "a five-year-old male" and "a nine-seasons bull";[382] for these are equivalent.

The cow sheds its teeth at two years and, like the horse, not all at once. They do not shed their hooves when they have foot-disease, but only have very swollen feet.

The milk, once the female has given birth, becomes usable; before that she does not have milk. The first milk, when it has set, becomes as hard as a stone; this happens unless it is mixed with water.

Females younger than a year do not mate, unless there is something monstrous involved; but cases have been observed of being mated and mating even at ten months. Most females start mating around the month of Thargelion or Scirrophorion;[383] some, however, become pregnant as late as fall. When many are pregnant and submit to mating, it is believed to be a sure sign of stormy and rainy weather.

Females herd together as female horses do, but to a lesser extent.

6.22
The Horses

The male horse starts to mate at two years and the female to be mated at two years; but cases of this are few, and the offspring smaller and weaker. For the most part, the males start to mate, and the females to be mated, at three years; and until they reach the age of twenty years, the offspring get ever better. The female is pregnant for eleven months and she gives birth in the twelfth. The male horse does not impregnate her in a fixed number of days, but rather sometimes in one, two, or three days, sometimes in more; the ass when mounting impregnates more quickly than the horse. Mating is not burdensome for horses the way it is for cows. The most lustful animal—both of the females and of the males—after the human being is the horse. The mating of

382. *Iliad* 2.403, 7.315, *Odyssey* 19.420, 10.19.
383. May–June.

the younger ones occurs, contrary to their age, when they have good pasture and abundant nourishment. For the most part, the female gives birth to one offspring;
576ᵃ1 sometimes, however, to at most two. A female has been observed to give birth to two mules; people judge these to be monstrosities.

The male horse, then, mates at thirty months, so that he is fit to generate offspring when he has ceased shedding his teeth (but some have been observed to impregnate while still shedding, so it is said)—unless he happens to be by nature infertile. He has forty teeth. He sheds the first four at thirty months, two from the upper jaw, two from the lower. And again, when another year has passed, he sheds four others in the same way: two from the upper jaw, two from the lower. And again, when another year has passed, he sheds four others in the same way. When four years and six months have passed, he no longer sheds any. But one has been observed that immediately shed all his teeth at the same time as the first, and another that shed them all at the same time as the last; but things of this sort rarely occur. Hence it pretty much happens that when he is four years and six months, he is most useful for generating offspring.

Older horses are more generative of offspring, both the males among the males and the females among the females. Male horses mount both their mothers and their daughters; in fact, a herd is believed to be complete when the males mate with their own offspring.

The Scythians ride their pregnant female horses, as soon as the fetus has turned, and say that this makes them give birth more easily. The other four-footed animals give birth lying down, which is why the fetuses of all of them emerge sideways; but the female horse, when the time of delivery is near, stands upright to deliver her offspring.

Most male horses live for eighteen or twenty years, some for twenty-five or thirty; if one treats him with care, it may stretch out to fifty years. But the longest life for the majority of them is, for the most part, thirty years. The female, for the most part, lives twenty-five years, though some have been observed to live for forty
576ᵇ1 years.The males live for less time than the females because of their matings; and those that are raised on their own live longer than those in herds. The female attains her final length and height in five years; the male in six years. After that, in another six years, the animal attains its body mass, and improves until it is twenty years. The females reach maturity before the males, though in the womb the males do so before the females, just as in the case of the human beings;[384] the same thing happens in the case of all the other animals that do not give birth to many offspring.

They say that the female suckles the mule foal for six months, but then no longer submits to it because of being tugged at and caused pain; it suckles the horse foal for a longer time.

Both the horse and the mule are at their prime after the shedding of their teeth. When they have all been shed, it is not easy to know their age. That is why people say

384. *GA* 775ᵃ4–27.

they have a "mark of age" when they have not shed them; but when they have shed them, they do not have one. Nonetheless, the age can be most easily known, even after the shedding, from the canines; for in horses that are ridden they become small because of the friction (for the bit is inserted there); while those of horses that are not ridden are large and separate, while in young horses they are sharp and small.[385]

The male horse mates in all seasons and throughout life; the female too is mated throughout life, but not in all seasons, unless a halter or some other sort of compulsion is applied. There is no fixed season in which being mated and mating is excluded. Nonetheless, though mating may occur at any random time, it may not be possible to rear the offspring they have delivered. In a herd in Opus there was a horse that used to mate when he was forty years old, though he needed to have his front legs raised to do so.

Female horses start to be mated in spring. Once a female horse has given birth, she does not immediately thereafter become pregnant again but leaves an interval, and she gives birth to better offspring four or five years after giving birth. It is altogether necessary to leave interval of one year and to make her, as it were, fallow. **577^{a}1**

The female horse, then, gives birth only at intervals, as was said, but the female ass does so continuously.

Among the female horses, some are wholly infertile; some conceive, but cannot deliver an offspring; they say that a sign of this sort of condition is that, when the fetus is cut open, it has other kidney-like entities around the kidneys, so that it seems to have four kidneys. When the female horse has given birth, she eats up the chorion immediately and also eats off from the foal the growth on the foal's forehead called the *hippomanes*. In magnitude it is a little smaller than a dried fig; in appearance flat, round, and black. If anyone gets hold of it first and the female horse smells it, she gets deranged and maddened due to the odor. That is why indeed the sorceresses seek and collect it.

If a female horse that has been mated by a horse is mated by an ass, it destroys the already existing fetus.

The horse trainers do not establish a leader for the horses, as for the cows, because their nature is not stable, but hasty and changeable.[386]

6.23
The Asses

The ass mates and is mated at thirty months and sheds its first teeth. It sheds its second in six months, and its third and fourth likewise; they call these fourth ones its "mark of age."[387] A female ass has been observed to conceive at one year and be delivered of

385. Reading μικρός.
386. Reading διὰ . . . εὐκίνητον.
387. 576^{b}14.

an offspring. When she has been mated, she discharges the semen when she urinates, unless prevented; that is why people beat them immediately after mating and chase them around. She gives birth in the twelfth month. She mostly gives birth to one offspring; for she is by nature one-offspring-bearing; but sometimes she also gives birth to two.

An ass that mounts a female horse destroys the fetus of the horse, as was said.[388] But a horse does not destroy that of the ass, when the female horse has been mated by an ass. When pregnant, a female ass has milk at ten months. Seven days after giving birth, the male may be put to her, and she is most receptive of the impregnating agent on this day, though she may also take it in later. If she does not give birth before losing her mark of age, she never takes in the impregnating agent or conceives for the rest of her entire life. She is not willing to give birth if she is being watched by a human being or if she is in the light, and so they lead her into a dark place when she is about to give birth. She gives birth throughout life, if she gives birth before losing her mark of age. The ass lives for more than thirty years, and the female for more years than the male.

When a horse mates with a female ass or an ass with a female horse, there is far more often a miscarriage than when animals of the same kind have sexual intercourse with each other—for example, a horse with a horse and an ass with an ass. When a horse and an ass have sexual intercourse, the period of pregnancy is in accord with the male—I mean that birth occurs at whatever time it does in animals of the same kind [as the male]. But as regards the size of its body, its form, and its strength, the resulting offspring is made more like the female. If she is continuously subject to intercourse and certain intervals of time are not left in her being mated in this way, the female rapidly becomes infertile; that is why those involved in this business do not continuously bring them together to have intercourse in this way, but leave a certain interval of time. No female horse will admit a male ass (or a female ass a male horse), unless the ass happens to have been suckled by a female horse; for that reason, in fact, people put the ones called "horse-suckled" under a female horse. These mate in the herd when they overpower by force, just like the male horses.[389]

6.24
The Mules

The mule mounts and mates after shedding its first teeth, and at seven years it can even impregnate, and a case has been observed of a ginnus coming to be when a mule mounted a female horse. After that it no longer mounts. The female mule too has been observed to get pregnant, though not so as to carry the fetus through to the end. In Syria, in the part that is below Phoenicia, the half-asses[390] are mated and give birth; but their kind, though similar, is distinct from that of the mule.

388. 577a13–15.
389. 572b15.
390. 6.36.

The so-called ginni come to be from a female horse, when she is sick during pregnancy, just as in the human beings dwarfs come to be, and in the pigs after-pigs;[391] and ginni, like dwarfs, have a large sex organ.

The half-ass lives for many years; for one has been observed to have lived for as much as eighty years, as one did in Athens when they were building a temple; this animal was let go at that point because of its age, but by continuing to help in hauling and by accompanying the teams, urged them on to work, so that they passed a decree that the grain merchants not drive it away from their display trays. The female mule **578ª1** ages more slowly than the male. Some say that she purges her menses by urinating, and that the male ages more quickly because he smells the urine.

This, then, is the mode of generation of these animals.

6.25
The Ages of the Four-Footed Animals

Those having to do with the care of them know how to distinguish the young four-footed animals from the old ones: if when the skin on the jaw is pulled away it quickly goes back, the four-footed animal is young; if it stays wrinkled for a long time, the animal is old.

6.26
The Camel

The female camel is pregnant for ten[392] months, and always gives birth to one offspring only; for it is one-offspring-bearing. They take the offspring away from the camels at one year. The female camel lives a long time, more than fifty years. She gives birth in spring, and has milk until she holds a fetus in her womb. Her flesh and milk are the most pleasant tasting of all; people drink the milk mixing one part milk with two or three parts water.

6.27
The Elephant

The elephant first mates and is mated before the age of twenty years. When the female has been mated, she carries the fetus in her womb, some say for eighteen months, others say for three years. The cause of the non-agreement about the time is that it is not easy to observe the mating. The female gives birth while settling down on her

391. $573^{b}5$.
392. Cf. $546^{b}3$–4.

back parts, and is clearly in pain. When the calf is born, it suckles with its mouth and not with its trunk; it walks and sees as soon as it is born.

6.28
The Wild Pigs

The female wild pigs are mated at the start of winter and give birth in spring, when they retreat to impassable places that are especially precipitous, full of chasms, and thickly shaded. The male spends his time among the female pigs, for the most part, for thirty days. The number of the offspring and the period of pregnancy are the same as for the tame pigs. Their voiced sounds are much the same as of the tame ones, except that it is more often the female that voices them, rarely the male. Wild males that have been castrated grow larger and more bad-tempered, as Homer too says in
578b1 his poem: "He reared there a castrated wild pig: not like a grain-eating beast it was, but like a wooded peak."[393] They get castrated because when they are young they are attacked by an itching disease of the testicles; then they rub themselves against trees and squeeze out the testicles.

6.29
The Deer

The female deer is mated, as was said previously,[394] in most cases when withdrawing (for the female often does not submit to the male because of the tension [in his sex organ]); nonetheless they do sometimes submit to him and are mated like the sheep. When they are in heat, the females avoid each other. The male changes partners and does not spend his time with one female, but after leaving a short interval of time has sex with others. Mating occurs after the rising of Arcturus, around the months of Boedromion and Maemacterion.[395] The female is pregnant for eight months. She conceives in a few days after mating, and many are impregnated by a single male. For the most part, she gives birth to one offspring, but a few have been observed to give birth to two. She produces them beside roads, because of her fear of wild beasts.[396] The growth of the fawns is rapid. Purgation of the menses does not occur in female deer at other times; when they give birth, a phlegm-like purgation is produced.

They customarily lead the fawns to lairs, that is, a place of refuge for them; this is an inaccessible cave with one entrance, where they customarily defend themselves against attackers.

393. A mix of *Iliad* 9.539 and *Odyssey* 9.191.
394. 540a5.
395. I.e., in October.
396. 611a15–17.

Stories are told about the life of the deer implying that it is long-lived, but it is evident that none of the stories is at all perspicuous, and the pregnancy and the growth of the fawns do not take place as if the animal were long-lived.

On the mountain called "Deer Mountain," which is in Arginussa in Asia, where Alcibiades died, all the female deer have their ear split, so that even if they wander far afield they can be recognized by this; their fetuses while still in the womb already carry this sign.

The females have four nipples like the female cows. After the females have been impregnated, the males separate off by themselves, and because of the impulse of their sexual desires, each one when left solitary digs a hole, and stinks[397] like the male goats. And their faces become black because of being splattered,[398] like those of the male goats.[399] They spend their time in this way until the rain comes; after that they return to pasture. The animal does these things because of being lustful by nature and because of its fatness; for the fatness of these animals becomes excessive in the summer; that is also why they are unable to run, but are caught by hunters on foot in the second or third chase, and flee toward the water because of the heat and their panting for breath. At the time when they mate, their flesh becomes of poor quality and foul-smelling, like that of the male goats. In the winter they become thin and weak, but toward spring they are most at their peak for running. When they flee, they make a pause in their running, and stand still until their pursuer draws near; then they flee again. They seem to do this because of being in pain internally; for they have an intestine that is so thin and weak that, if one gently strikes the animal, it breaks open, although their skin remains sound. **579^{a}1**

6.30
The Bears

The female bears are mated, as was said previously,[400] not by being mounted but when they are lying on the ground. The female bear is pregnant for thirty days; she gives birth to one or two offspring, at most five. She gives birth to a fetus that is the smallest in comparison to the size of her own body; for it is smaller than the one a weasel gives birth to, but larger than a mouse, is hairless and blind, and its limbs and most of its parts are pretty much unarticulated.

The female is mated in the month of Elaphebolion,[401] and gives birth around the season for going into hiding. Around this time both the female and the male become

397. Reading βρομεῖ. Alternatively, βρωμᾶται ("bellows").
398. Perhaps with mud or sweat from digging.
399. Reading τὰ τῶν τράγων.
400. $539^{b}33$–$540^{a}2$.
401. February–March.

very fat. When the female has reared her offspring, they show themselves in the third month, and it is already spring.

The female porcupine also goes into hiding and is pregnant for an equal number of days, and in all other respects is like the female bear.

It is a task to capture a pregnant bear.

6.31
The Lions

The lion mates back to back, and urinates backward, as was said previously.[402] It does not mate and give birth in every season, but once each year. It gives birth in spring and, for the most part, gives birth to two offspring or at most six; but sometimes it gives
579[b]1 birth to only one. The story told about the expulsion of the uterus after giving birth is silly; it was contrived because of the rarity of lions, and because the one who contrived the story was at a loss as to the cause; in fact, the lion kind is rare and does not occur in many places, but in all of Europe is found only between the rivers Achelous and Nessus. It gives birth to such altogether small offspring that at two months they can hardly walk. The ones in Syria give birth five times; first to five offspring, then always to one fewer; after that they no longer give birth to any, but remain infertile to the end.[403]

The lioness does not have a mane, but the male lion does. Of his teeth, the lion sheds only the four so-called canines, two from the upper jaw and two from the lower; it sheds them at six months.

6.32
The Hyenas

The hyena is wolf-like in color, but it is hairier, and has a mane the whole length of its spinal column. What is said about its sex organs, that it has that of a male and that of a female, is false. In fact, the male has one like that of the wolves and of the dogs; and has the one that seems to be characteristically female under his tail: it is much the same in shape as that of the female, but it does not have any duct; and underneath it is the duct for the residue. The female hyena also has what is said to be similar to the female's sex organ; like the male, it has it underneath the tail, but it has no duct; after this is the duct for the residue, and underneath this is the true sex organ.

The female hyena also has a uterus like all the other female animals of this sort. It is a rare thing to catch a female hyena; among eleven hyenas, at any rate, a hunter said he caught only one female.

402. 539[b]22.
403. *GA* 750[a]31–35.

6.33
The Hares

The hares are mated by having intercourse back to back, as was said previously[404] (for the animal urinates backward). They are mated and give birth in all seasons. They are subject to superfetation when they are pregnant; they give birth every month. They do not give birth to their offspring all together, but leave an interval of as many days as it happens to be. The female has milk before giving birth, and after giving birth is **580ª1** immediately mated; she conceives while suckling her offspring. In coarse-grainedness the milk is like that of the pig. She gives birth to blind offspring like most of the multi-split-footed animals.

6.34
The Foxes

The fox mates by mounting the female, who gives birth like the bear, and to even more unarticulated offspring. When she is about to give birth, she goes off to a remote place, so that it is a rare thing to catch a pregnant one. When the offspring have been born, it is by licking them with her tongue that she warms them and completes their concoction. She gives birth to four at most.

6.35
The Wolf, the Cat, and Others

The wolf is pregnant and gives birth like the dog both in time and in the number of offspring that come to be, and, like the dog, it gives birth to blind ones. It mates and is mated in a single season, and gives birth at the start of summer. There is a sort of account stated about the wolf's giving birth that borders on myth; for they say that all wolves give birth in twelve days of the year. The cause of this is in the myth they state: because in that many days did they transport Leto from the land of the Hyperboreans to Delos, while she took on the appearance of a she-wolf because of her fear of Hera. Whether this is the time of their giving birth or not, no one has up to now, at any rate, been able to observe, but only that it is what is stated. On the other hand, the saying that wolves give birth only once in their live is manifestly not true.

The cats and the ichneumons give birth to as many offspring as the dogs, and nourish them in the same way. They live for around six years.

The panther also gives birth to blind offspring like the wolf, and gives birth to four at most.

404. $539^{b}22$–24.

The *thôs*[405] conceive like the dogs, and give birth to blind offspring; in number, they give birth to two, three, or four. The *thôs* is in form long [from head] to tail, but relatively shorter in height. It is similarly remarkable for its speed, even though its legs are short, because it is supple and makes long leaps forward.

6.36
The Half-Asses

580b1 In Syria there are so-called half-asses, which are distinct in kind from the ones that come to be from the copulation of a horse and an ass, though as similar to them in appearance as the wild asses are to the domestic ones; they derive their name from the similarity. The half-asses, like the wild asses, are remarkable for their speed. These half-asses generate offspring among themselves. A sign of this is that some of them came from Phrygia in the time of Pharnaces, the father of Pharnabazus, and the half-asses still remain there. There are three of them now, but formerly there were nine, so they say.

6.37
The Mice

The generation of mice is most wondrous compared to that of the other animals, both in numbers and the rapidity. For a case has been observed of a pregnant female that was once locked up in a jar of millet seed; after a short time, when the jar was opened, the number of mice that appeared was one hundred and twenty.

A puzzle also arises about the generation of mice on the surfaces of fields and their disappearance; for in many places an untold number of field mice customarily appear, with the result that little is left of the entire crop of grain. Their reproduction is so rapid that some farmers, who work on farms that are not that large, having seen on the previous day that it is time to reap the harvest, find, on leading the reapers out at dawn the next day, that the entire crop has been eaten. Their disappearance too is unaccountable; for in a few days they disappear altogether; and yet before that the people failed to control them by fumigating them, digging them out, hunting them, and setting the pigs on them (for these dig up the mouse holes). The foxes also hunt them, and the wild ferrets in particular destroy them, when they fall upon them; but they have no control over their fecundity and rapid reproduction, nor does anything else except the rain, when it falls upon them. Then they disappear rapidly.

405. 507b17.

There is a place in Persia where, when a female mouse is cut open the female fetuses are seen to be pregnant. Some people say—indeed strongly contend—that if the females lick salt they become pregnant without mating.

The mice in Egypt have hard hair like the hedgehogs. There are other mice that **581a1** walk on two legs; for they have small front legs and long back ones; they come to be in great numbers. There are also many other kinds of mice.

BOOK 7[406]

7.1
Puberty in Human Beings

As regards the development of the human being, first inside the female and afterward until old age, all that happens due to the animal's own proper nature does so in the following way.

The difference between the male and the female and their parts was stated previously.[407] The male starts to have seed, for the most part, when fourteen years have been completed. At the same time, the growth of the pubic hair starts, just as plants that are about to have seed produce flowers first, as Alcmaeon of Croton says. Around this same time, the voice starts to change, becoming harsher and more uneven, neither high-pitched nor deep as yet, nor entirely even, but sounding like strings that are badly strung and harsh: what they call "bleating like a goat." This occurs more in those trying to have sexual intercourse; for in those who are eager for this, the voice changes to the voice of a man, while in those who abstain from it, the contrary happens. If they assist in holding themselves back through exercises, which is precisely what some do who are serious about belonging to choruses, their voice stays as it is for a long time and the change that it undergoes is altogether small.

Also a swelling of the breasts and of the sex organs occurs, which change not only in size but also in form. And around this time, in those who try rubbing in connection with the emission of seed, not only does pleasure occur when emitting seed but pain too.

Around the same time, in the female a swelling of the breasts occurs and the so-called menses flow down; this is blood like that of a newly slaughtered sacrificial **581b1** victim.[408] (The whites[409] occur also in children who are altogether young, especially if they are furnished with liquid nourishment; it prevents growth and emaciates the children's bodies.) The menses occur in most females when the breasts have risen two

406. Book 7 is placed after Book 9 in many manuscripts. Its authenticity has been questioned.
407. 3.1.
408. A common analogy in the Greek world.
409. Leucorrhea.

finger-widths. And the voice in girls also changes for the deeper around this time. For while a woman's voice is, in general, higher-pitched than a man's, younger women's voices are higher-pitched than older women's, just as boys' ones are higher-pitched than men's; but the female children's voice is higher-pitched than the male children's, and the maiden's pipe higher-pitched than the boy's.

Female children are most in need of guarding around this time; for they are most impelled toward pleasures of sexual activities when these start, so that unless precautions are taken to prevent causing movement that goes further than the one their bodies make in changing, without being involved in sexual activities, they are habituated in following them into later life. For the females who engage in sexual activities while altogether young become more intemperate, and so do the males, if they are unguarded either in one direction or in both;[410] for the ducts become dilated and make the body open-ducted in this part;[411] and at the same time the memory of the pleasure that accompanied them then produces an appetite for the sexual intercourse that then occurred.

Some men are impuberal from birth and infertile because of a deformation in the genital area; likewise some women too are impuberal from birth.

The males and the females also change in their conditions, as regards being healthier or sicklier, and as regards the leanness, fatness, and well-nourishment of their body; for, after puberty, some males change from being thin to being fat and become healthier, while others do the contrary; this happens in the same way in girls too. For all boys and all girls that are full of residues, when such things are secreted along with the seed or the menses respectively, their bodies become healthier and better nourished with the discharging of the things that hinder health and nourishment; in all the contrary cases, their bodies become thinner and sicklier; for the secretion in the seed or in the menses comes from the nature and good conditions of the body.

Further, in the case of girls, the breasts also differ from one girl to another; for some have altogether large ones, others small ones. For the most part, the former comes about in all those who were full of residues in childhood; for when the menses are due but have not yet come, the more liquid there is, the more it compels [the breasts] to swell up, until [the menses] have flowed down; the result is that the breasts acquire bulk at that time and remain that way later on as well. In the males too the breasts become more noticeable and womanlike in those, both younger and older, whose constitution is liquid, smooth, and without large blood vessels, and who are dark rather than pale.

Up to the age of twenty-one years the seeds are at first infertile; then, though they are fertile, the offspring of young men and young women are small and incomplete, as they are in the case of most of the other animals.

410. I.e., as active partners or as passive partners (†*Pr.* 4.26).
411. †*Pr.* 4.11.

The young females conceive more quickly, but, when they have conceived, they suffer more in giving birth. Also, their bodies develop less completely, for the most part, and age faster, both in those men who are lecherous and those women who give birth too many times; for it seems that no further growth occurs either after the third giving birth.

All women who are intemperate in relation to sexual intercourse settle down and become more temperate after giving birth several times. After their twenty-one years, women are in a condition favorable to childbearing, while men continue to improve.

It is the fine-grained seeds that are infertile, while the more granular are fertile and more male-generating; those that are fine-grained and unclotted generate females.

Also, a growth of chin hair occurs in men around this same age.

7.2
The Menses

The onset of the menses occurs toward the end of the month; that is why some of those who deal in sophistries say that the moon too is female, because the purgation of the menses and the moon's waning occur together, and after the purgation and the waning both become filled up.[412] In women it is rare that the menses occur regularly every **$582^{b}1$** month; in most cases, they occur in the third month.[413] Those in whom they occur for a short time, two or three days, recover easily, while those in whom they last for many days have more difficulty. For they suffer during those days; for though in some the purgation of the menses occurs all at once, in others little by little. In all of them the body is distressed until they are discharged. In many women, when the menses are starting and about to burst out, choking feelings and noise are produced in their uterus, until they have burst out.

By nature conception occurs in women after recovery from these; and the ones in whom they do not occur remain childless, for the most part. Nonetheless, even without their occurrence, some do conceive. These are all the ones in whom as much moist secretion is collected as remains after the purgation of the menses in fertile women, but not enough to be discharged outside. Some also conceive while the menses are still occurring but do not conceive after them: these are the women whose uterus closes up immediately after the purgation. In some women the menses are produced throughout their pregnancy up to the end; the result, however, is that they give birth to inferior offspring, and their offspring either do not survive to grow or grow up weak.

412. *Plêrôsis* means both "filled up" and "pregnancy."

413. If menstruation occurs in month one, the next menstruation mostly occurs not in month two, but in month three. In other words, the interval between menstruations is more than four weeks. The months are lunar months.

In many women too, because of their need for sexual intercourse, either due to their youth and time of life or to long abstinence, the uterus descends below and the menses are often produced three times a month until they have conceived; then the uterus returns to its proper place above. But sometimes, even if the uterus is in good condition, but happens to be wet, it blows out[414] the wetter part of the seed.

Among all the animals, as was said previously,[415] it is in women more than the other females that the most purgation is produced. For in the non-live-bearing animals no sign[416] of this sort appears, because this residue is diverted into the body (for some are larger than the males, and further, in some it is used up in hard-scales, in some in soft-scales, and in some in a mass of feathers), while in the footed live-bearing ones it is diverted into the hair and the body (for the human being is the only smooth one), and into urine (for in most animals of this sort the secretion produced is coarse-grained and copious); but in women the residue is diverted into the purgation instead of these.

It is likewise in the case of men; for in proportion to his size, the human being emits the most seed compared to the other animals (that is also why the human being is the smoothest of the animals), and of these, the ones whose natures are wetter and not very fleshy, and the paler ones more so than the darker ones. It is the same way in the case of women. In the well-fleshed ones, most of the secretion goes to nourish the body. And in sexual intercourse those who are paler in nature exude more liquid than the dark ones. And the liquid and bitter sorts of nourishment produce more of this sort of effect in sexual intercourse.

7.3
Conception

A sign that women have conceived is when the place is dry immediately after sexual intercourse. If the lips of the mouth [of the womb] are smooth, they are not suited to conception (for the seed slips out), nor if they are thick. But if to the touch of a finger the lips feel rather rough and clingy, and if they are thin, they are in a condition favorable to conception. For purposes of conception, then, this is the condition one must establish the uterus in; for purposes of non-conception, the contrary one; for if the lips are smooth, conception does not occur; that is why some people oil that part of the womb on which the seed falls with cedar oil, white lead, or frankincense, diluted with olive oil. If the seed stays in for seven days, it is evident that it has taken hold; for what are called "effluxions"[417] occur during these days.

414. 635ᵇ4–5.
415. 521ᵃ25–27, 572ᵇ29–31.
416. 572ᵇ32–573ᵃ2.
417. 583ᵇ11–12, *GA* 758ᵇ5–6.

The purgations recur in most women at a certain time after conception, at thirty days at most in the case of female fetuses, at around forty days in the case of male ones. After the births too the purgations tend to recur at the same number of days, though not indeed with equal exactness in all women. But after conception, and the days just mentioned, it is no longer natural for them to occur, but they are diverted into the breasts and become milk. The first sign of milk appearing in the breasts is small in quantity and filled with filaments.

When women have conceived, a perception of it occurs especially in the flanks (for in some women these immediately become fuller; this happens more noticeably in thin women) and in the groin. In the case of male fetuses, their movement occurs more on the right side, for the most part, at around forty days, in that of female fetuses on the right side at around ninety days. Nonetheless, one must not suppose that there is any exactness in these things; for in many who give birth to a female the movement occurs on the right, and in those in whom it is on the left to a male. But these and all things of this sort differ, for the most part, with respect to the more and less.

Around this time too the embryo divides into parts, while previously it consisted of unarticulated fleshy material. Those that are destroyed at up to seven days are called "effluxions," those at up to forty days "miscarriages." It is during these days that most embryos are destroyed.

The male embryo, when it emerges at forty days, although if one puts it into anything else it dissolves and disappears, if one puts it into cold water, it gets composed as if in a membrane; and if incisions are made in this membrane, the fetus appears the size of one of the big ants: all its members are clear to perception, as well as the other parts, especially the sex organ, and the eyes—as in the case of the other animals—are very large.

The female embryo that is destroyed within three months appears unarticulated, for the most part. One that has reached the fourth month has divided into parts and quickly attains the rest of its articulation. For a time, then, the female is slower to attain the complete development of its parts than the male, and is more often born at ten months than the male. But when they are born, the females are quicker than the males to reach youth, prime of life, and old age, especially those who have given birth a large number of times, as was said previously.[418]

7.4
Pregnancy

After the uterus has conceived the seed, it immediately closes up in most women until seven months have occurred; in the eighth it opens up, and the fetus, if viable, descends in the eighth month. Those that are not viable but have suffocated at eight

418. $582^{a}21–25$.

months, women do not expel them by giving birth at eight months, nor do the fetuses descend in the eighth month, nor does the uterus open up at this time. In fact, it is a sign that the offspring is not viable, if it has been born without the circumstances just mentioned being present.

After conception, women feel oppressed in their entire body, have darkness in front of their eyes, and pains in their head. These develop more quickly in some women, pretty much at ten days, in others more slowly, in accord with whether they happen to be more or less productive of residues. Further, bouts of nausea and vomiting attack most women, especially women of the former sort, when the purgations cease but have not yet been diverted to the breasts. Some women, then, suffer more at the start, some later on when the embryo has already acquired more growth; in many too stranguries occur at the end.

For the most part, those that conceive males recover more easily [from these complaints], and end up with a better complexion, but in the case of those who conceive females it is the contrary; for they have worse complexions, for the most part, spend their time feeling more oppressed, and in many tumors in the legs and swellings of the flesh occur; nonetheless, in some women the contrary things occur too.

It is usual for all sorts of appetites to occur in pregnant women and for them to change abruptly, which is what some people call "having cravings."[419] In the case of [those pregnant with] females, the appetites are sharper, but when the things are at hand they are less able to indulge them.[420] In a few women, it happens that the body is in better condition when they are pregnant. Also, they glut themselves most[421] when their babies start to produce hair. Also, in pregnant women the hair that is congenital becomes sparser and falls out, but in places where they are not accustomed to have hair it grows more thickly.

Also, for the most part, the male [fetus] exhibits more movement when inside the body than the female, and is born more quickly, the female ones more slowly. Also, labor in the case of the female ones is more continuous and more gradual, while in the case of the male ones, while it is more abrupt, it is more difficult. Women who have sex with men before giving birth give birth more quickly. Sometimes women seem to be in labor not because labor is occurring but because the fetus turns its head, and this appears to be the start of labor.

In the other animals the completion of giving birth is accomplished in one way only; for a single time of giving birth is determined in all animals; but for the human being alone among the animals there are many times; for seven-month, eight-month, and nine-month ones occur, and in most cases ten-month ones; but some women even reach the eleventh month.

419. Literally, "having ivy-sickness."
420. Because of feeling more oppressed and so on.
421. Alternatively, "they are most nauseated or disgusted."

All the offspring that are born before the seventh month can in no circumstances live. The seven-month ones are viable first, but many of them are weak (and that is why people swaddle them in wool), and many of them have some of their ducts undivided, such as those of the ears and the nostrils; but as they increase in size these become divided, and many babies of this sort live. As for the eight-month ones, around Egypt and in some places where the women are good at bearing offspring, and easily bear and bring to birth many, and where, when they have been born they are able to live, even if they are monstrous births, in those places the eight-month ones live and are reared, while in the places around Greece altogether few survive, while the majority perish; and because of the supposition [that this is the norm], even if one does survive, they think that the offspring is not an eight-month one, but instead take it that the women themselves had conceived earlier without knowing it. **584ᵇ1**

The women suffer most in the fourth month and the eighth, and if they abort in the fourth month or the eighth, for the most part, they themselves also perish; as a result, not only do eight-month offspring not live, but when they are aborted the women who give birth to them are also put at risk.

In the same way, it seems, the same error is committed when offspring appear to be born later than the eleventh month; for in their case too the start of conception escapes the notice of the women; for often when their uterus had previously become distended with air, and later they had sex and conceived, they think that the former was the start of conception, because it furnished them with similar signs.

This is the difference in number, then, in the ways the giving of birth is accomplished on the part of the other animals compared to human beings; also, while some of them are one-offspring-bearing and others many-offspring-bearing, humankind plays a double game. For although in most cases and among most peoples women give birth to one offspring, often and in many places they give birth to twins—for example, around Egypt. They even give birth to three or four, especially in certain places, as was said previously.[422] The greatest number given birth to is five; for this has already been observed to happen in several cases. One woman produced twenty in four births; for she gave birth to five at a time, and most of them were reared.

In the other animals, even if the twins are a male and a female, they are reared after birth, and are no less likely, when born, of being reared and of surviving than [twin] males or females; among human beings, on the other hand, few twins survive if one is female and the other male. **585ᵃ1**

Among the animals, the woman and the female horse are the most receptive of mating while pregnant; the others when pregnant avoid the males, except for all the ones in which superfetation is natural, like the hare. But the female horse, if she has

422. 584ᵇ7.

conceived the first time, does not do so again by superfetation, but, for the most part, gives birth to only one offspring, while in the human being, though superfetation is rare, it has sometimes occurred.

Those, though, that are conceived by superfetation a long time later do not reach completion, but after producing pain cause the preexisting fetus to be destroyed along with themselves (for a case has been observed where, after a miscarriage, no less than twelve embryos conceived by superfetation fell out). But if the second conception occurred soon after, mothers have brought the superfetation to birth, and given birth as to twins from the same semen, as in the myth about Iphicles and Heracles. For that that has in fact happened is evident. For an adulterous woman gave birth to one child like her husband and another like the adulterer. And a woman already pregnant with twins conceived a third by superfetation; when the normal time had come, she gave birth to the former as full-term babies and to the latter as a five-month one; and this one died immediately. And to another woman it happened that she gave birth first to a seven-month baby and later to two full-term ones; and of these the first died but the second ones lived. And some women have conceived at the same time as they miscarried and lost the one but gave birth to the other.

In most women, if they have sexual intercourse after the eighth month, the baby emerges covered in a viscous mucus-like liquid. And often it appears covered in the foods that the mother has been given. And when the mothers have used too much salt, the babies are born without nails.

7.5
Fertility (1)

The milk that occurs before seven months is useless; but at the same time as babies become viable, the milk becomes useful. The first milk is also salty, as in sheep. During pregnancy most women are especially sensitive to wine; for they get relaxed, if they drink it, and lack strength.

The start of giving birth to offspring in women and of begetting them in males, and their cessation in both, is the emission of seed in the males and of menses in the women, except that they are not immediately fertile when the emissions start, nor any longer so when these become few and weak. The age at which they start has been stated.[423] The menses cease in most women at around forty years, but in those in whom they exceed this time, they last until fifty years. And some of these have been observed to give birth; but none at a later time.

423. 581a13, 31.

7.6
Fertility (2); Resemblance between Parents and Offspring

Most men generate offspring up to sixty years; when they exceed that, up to seventy years; and some men have been observed to generate offspring at seventy years.

It happens to many men and many women that they are unable to produce children when coupled with each other, but can when coupling apart. The same thing also happens as regards generating males and generating females; for sometimes both women and men are male-generating or female-generating with each other, but become the contrary when coupling apart. And they also change with age; some generate females with each other when they are young, but males when they are older; in others the contrary also happens in this regard. And in the case of generating, in general, it is the same; in some no offspring comes to be when they are young, but rather when they are older; others generate at first, but generate no offspring later.

There are also some women who conceive with difficulty, but if they do conceive, bring the offspring to birth; others, on the contrary, conceive easily but cannot bring the offspring to birth. And there are men who generate females and women who generate males, as, for example in the myth about Heracles who in seventy-two offspring generated one daughter. Women who are unable to conceive unless through receiving treatment or through some other sort of circumstance are, for the most part, female-generating rather than male-generating. It also happens that many men who are able to generate offspring are later unable to do so, and then have it restored again.

From deformed parents deformed offspring are also born—for example, lame ones from lame ones and blind ones from blind ones, and, in general, offspring that often resemble them in their contrary-to-nature features, and possess signs akin to theirs—for example, growths and scars. And cases have been observed of something of this sort returning in the third generation—for example, a man had a mark on his arm that his son was not born with, but that his grandson had in the same place, blurred and dark.[424] Things of this sort, though, seldom occur, and in most cases from docked parents non-docked offspring are born, and nothing about these is fixed. There are also offspring who resemble their parents or their distant ancestors, but sometimes they do not resemble any. But it may return after several generations—for example, the woman in Sicily who committed adultery with the Ethiopian; for her daughter was not born an Ethiopian,[425] but her daughter's offspring was.

For the most part, females more resemble their mother, males their father; but the contrary also occurs, females resembling their father, males their mother. And with respect to the parts too, resemblances occur to the parts[426] of each. And cases have been observed of twins born that did not resemble each other, but for the most part,

424. *GA* $721^{b}28$–$722^{a}1$.
425. I.e., black.
426. Retaining μέρη.

most are alike; thus, even after giving birth, a woman—who a week later had sexual intercourse and conceived—gave birth to a second child as like the first as a twin. There are also women who generate offspring who resemble themselves, while others generate ones that are like the man, as did the mare of Pharsalus called "the Just."[427]

7.7
The Emission of Male Seed

In the emission of seed, it is first preceded by breath (the emission shows clearly that it occurs due to breath; for nothing is thrown to a distance without a force of breath). When the seed has taken hold of the uterus and has remained inside for a time, a membrane surrounds it; for when it emerges before it has become articulated, it looks like an egg encompassed in a membrane after its shell has been removed; the membrane is full of blood vessels.

All the animals that swim, fly, or walk, whether live-bearing or egg-laying, come to be in the same way, except that in some (the live-bearing ones) the umbilical cord goes to the uterus, in some to the egg, and in some to both—for example, certain kinds of fishes.[428] Some have [the seed] encompassed by a membrane, others by the chorion. First the animal develops within the innermost membrane, then another membrane develops around this one, mostly attached to the womb, but partly detached, and containing water. In between the two is a liquid that is watery or sanguineous, which by women is called the "forewaters."

7.8
The Fetus and the Umbilical Cord

All the animals that have a navel grow by means of the umbilical cord. The umbilical cord, in all those that have cotyledons, is attached to the cotyledon, while in those whose uterus is smooth it is attached to the uterus at a blood vessel. As for their shape within the uterus, the [fetuses of the] four-footed animals all are stretched out, the footless ones are on their sides (for example, the fish), and the two-footed ones
586[b]1 are bent up (for example, the bird); the human being too is bent up, and has the nose between the knees, the eyes on the knees, and the ears outside them. All animals alike have the head up at first; as they grow and start to move toward the outlet, they turn downward, and birth in accord with nature is head first, though some are born bent up and feet first contrary to nature.

427. *Pol.* 1262[a]24.
428. The selachians, 565[b]2–9, *GA* 754[b]27–33.

The fetuses of the four-footed animals contain residues too, when their development is complete, both liquid and lumps of dung, the latter in the extremity of the intestine, the urine in the bladder.

In those animals that have cotyledons in the womb, the cotyledons become ever smaller as the fetus grows, and in the end disappear.

The umbilical cord is a sort of sheath around blood vessels, the starting-point of which is from the uterus (from the cotyledons in those that have cotyledons, from a blood vessel in those that do not have them). In the larger animals (for example, in the fetuses of cows), there are four blood vessels, in the smaller ones two, and in the altogether small ones (for example, in the birds) only one blood vessel. These extend to the fetuses, two going through the liver (where the so-called portals are[429]) to the great blood vessel, and the other two through to the aorta where it divides, and the aorta, from being one, becomes two. Around each pair of blood vessels there are membranes, and around the membranes, like a case, is the umbilical cord. The fetus, as it matures, goes into the hollows [of the uterus] and there its movement is clear to perception, and sometimes it rolls over in the area around the sex organ.

7.9
Labor

When women are in labor, their pains are confirmed by them in many other parts but mostly in one or the other of their thighs. All those whose pains are most intense around the stomach are the quickest to give birth; all those who suffer first in the loins give birth with difficulty, but all those who do so in the lower abdomen are quick.

If they give birth to a male, the preceding discharges of serum are watery and yellowish; if they give birth to a female, they are bloodlike, but also watery; but in some neither of these occurs during labor.

In the other animals giving birth is not painful, although to a more moderate extent, they are noticeably troubled by labor; but in women the pains occur with more strength, especially in sedentary ones and those who do not have strong lungs and are not able to hold in their breath.[430] They suffer more in giving birth in fact, if they breathe out in between, when they are trying to exert force with the breath. First to emerge, then, is a watery discharge, when the fetus starts to move and the membranes are being broken open, then the fetus emerges while the uterus is being inverted, and what was inside the uterus is outside.

429. $496^{b}32$.
430. *GA* $737^{b}35$–$738^{a}1$.

7.10
Cutting the Umbilical Cord

The cutting of the umbilical cord by the midwife requires thought if it is not to miss the mark; for not only must she be able to help with women's difficult births with her skillful hand, but she must also have the acumen to deal with contingencies, especially as regards the tying of the umbilical cord of babies. For if the afterbirth has also emerged, the umbilical cord is ligatured off from the afterbirth with wool, and is cut above the ligature; and at the place where it has been ligatured, it grows together, and the adjoining part falls off. (If the knot comes untied, the fetus dies from the blood's running out.) But if the afterbirth has not immediate emerged, but remains inside when the baby itself is outside, it is cut away after the ligaturing of the umbilical cord. Often the baby has seemed to be born dead, when—being weakly before the umbilical cord has been ligatured—blood has run out into the umbilical cord and the surrounding part by luck; but certain midwives who are skilled in the craft have been observed to squeeze the blood from the umbilical cord back inside, and immediately the baby, that had previously become as if bloodless, came back to life again.

As was said previously,[431] the other animals too are born, in accord with nature, head first, but babies also have their hands stretched out by their sides. After coming out, they immediately utter a cry and bring their hands up to their mouths. They also emit residues, some immediately, others soon after, but all within a day; and these are very large in quantity considering the size of the child; it is what the women call the "meconium." Its color is bloodlike, very black and pitch-like, but after this it becomes milk-like; for the baby sucks immediately at the breast.

Before coming out the baby does not utter a cry, even if, during a difficult birth, its head sticks out but its whole body stays inside.

Those women in whom the purging of the discharges[432] starts prematurely have more difficulty in delivering the fetuses. If the purgations become less after the birth, and if only the first ones occur and do not last for up to forty days, the women get stronger and conceive more quickly.

The babies, when they are born, for forty days neither laugh nor cry while they are awake, though at night they sometimes do both; nor do most of them perceive it when they are being tickled; most of the time they sleep. But as it grows, it all the time changes to being more awake; and it is clear that it is dreaming, though it is only later on that it remembers what appears in the dreams.

In the other animals there is no difference between the bones, but all are completely formed; in babies, on the other hand, the bregma is thin, and solidifies later on. And while the other animals are born with teeth, babies start to grow teeth in the seventh month; they first grow the front teeth, some the upper ones first,

431. 586b6.
432. 586b33–35.

others the lower ones. And all the ones whose nurses' milk is hotter grow them more quickly.

7.11
Lactation

After the giving of birth and the purgations, milk is plentiful in women, and in some it flows not only at the nipples but at many places on the breast, and in some even in the armpits. And for some time afterward indurations remain, when liquid is not fully concocted and does not emerge, but accumulates; for the entire breast is so porous that if women swallow a hair in their drink, a pain occurs in their breasts (which they call "hair-sickness"[433]) until the hair either comes out spontaneously through squeezing or gets sucked out with the milk.

Women have milk until they have conceived again; then it stops and dries up alike both in the human beings and in the various live-bearing four-footed animals. While the milk is still coming out, the purgations of menses do not occur, for the most part, since cases have been observed of purgation while suckling. In general, the flow of liquid does not occur in several places at the same time—for example, in women with hemorrhoids the purgations are less. In some, the flow goes through the hips after being secreted from the loins but before reaching the uterus. Also, those who, when their purgations of menses do not occur, vomit blood are not at all harmed. **588^{a}1**

7.12
Convulsions in Babies

It is usual for most babies to be attacked by convulsions, and more so if they are well nourished and get milk that is both more abundant and[434] more coarse-grained and whose wet nurses are well fleshed. Harmful with view to this condition is wine—red wine more than white, and when unmixed with water—and most of the things that cause wind and constipation. (Most deaths occur before the seventh day; that is why they give them names then, because of trusting more in their preservation from that point on.) Also, they suffer more [from convulsions] during a full moon; and it is dangerous in all babies if the convulsions start from the back, especially as their age increases.[435]

433. Perhaps mastitis.
434. Reading καὶ πλείονι καὶ.
435. Reading προϊούσης δὴ τῆς ἡλικίας. The same phrase begins 10.1.

BOOK 8

8.1
Animal Psychology

As regards the rest of the nature of the animals and their generation, then, this is the mode. As for their actions and lives, they differ in accord with their characters and their nourishment. For present in most of the other animals too are traces of the modes that have to do with the soul, the precise ones that in the case of the human beings exhibit more evident differences. For tameness and wildness, mild-manneredness and harshness, courage and cowardice, sorts of fear and of confidence, sorts of spirit and of unscrupulousness, and, with regard to thought, likenesses of comprehension, are present in many of them, as in the case of the parts we spoke about.[436] For some of these differ by the more and less in comparison to the human being, as the human being does in comparison to many of the animals (for some of these belong in the human being more, some in the other animals more), while others differ by analogy; for as in the human being there is craft knowledge, wisdom, and comprehension, so in some of the animals there is another natural capacity of a similar sort. This sort of thing is most evident if we look at the case of childhood; for in children, though one can see, as it were, traces and seeds of the states that will be present in them later on, yet their soul at this time is no different (one might almost say) from the soul of the
588[b]1 wild beasts, so that it is not at all unreasonable if the same ones, or much the same ones, or analogous ones belong in the other animals.

Nature changes in such small steps from the inanimate to the animate that, due to the continuity, we fail to notice the boundary between these and where what is intermediate between them lies. For first after things of the inanimate kind are things of the plant kind; and among these, one differs from another in seeming to share more in life; but the whole kind, in comparison to the other bodies, seems pretty much like something animate, though in comparison to the animals, like something inanimate.

The change from these to the animals is continuous, as was said previously.[437] For some of the ones in the sea one might raise a puzzle as to whether they are an animal or a plant; for they are attached, and, when separated, many of this sort pass away—for example, the pinnas are attached, and the razor fishes, when pulled up, are unable to live. In general, the entire hard-shelled-animal kind are like plants in comparison to the animals that move by walking.

As regards perceptions, some of these give no sign at all of any, others an indistinct one. The nature of the body of some of them is flesh-like—for example, the so-called sea squirts[438] and the anemone kind; as for the sponge, it is altogether like the plants.

436. 486[a]15–487[a]10.
437. 588[b]5.
438. 531[a]17–19.

It is always by a small difference that one after another makes evident that they already possess more of life and movement. It is the same way with the actions of their life. For plants—all the ones that come to be from seed—manifestly have no other work than to generate again another like themselves; likewise in certain animals too, one can grasp no other work beyond the generation of offspring. That is why actions of this sort are common to all, but as soon as perception is added, their lives differ both as regards mating, because of the pleasure, and as regards giving birth and the rearing of offspring. Like plants, then, some animals simply complete their own generation of offspring in accord with the seasons; others also take trouble about the nourishment of their offspring, but when this is complete, they separate and do nothing further communally with them; but those that have more comprehension and a share in memory live longer and in a more political way with their offspring. **589^{a}1**

One part of the life for these animals is concerned, then, with actions having to do with the production of offspring, while yet another part is concerned with nourishment; for it is with these two things that the serious actions and the life of all animals are in fact concerned. Their nourishments differ most in accord with the matter of which they are composed. For the growth of each one comes about in accord with nature from this matter. But what is in accord with nature is pleasant; and all pursue the pleasure that is in accord with nature.

8.2
Terrestrial and Aquatic Animals

But the animals have been divided[439] according to their places; for some animals are terrestrial and others are aquatic. But this difference is stated in two ways; for some are said to be terrestrial and others aquatic because the former take in air and the latter water; while others—not taking either in, but being, in an adequate manner, naturally constituted in relation to the blend of cooling in one or other of these two elements—are called "terrestrial" or "aquatic" not because they breathe [air] or take in water, but because[440] of getting their nourishment and spending their time in the one or the other. For many, though taking in air and giving birth on land, get their nourishment from places covered by water and spend most of their time in water. These are precisely the ones, it seems, that, alone among the animals, play a double game;[441] for one could class them both as terrestrial and as aquatic animals.

Among those that take in water, none—either as a walker or as a flyer—gets its nourishment[442] from the earth, though among the walkers that take in air many [get theirs from the water]. Some do so in such a way, indeed, that they are unable to

439. $487^{a}10$–$^{b}32$, *Juv.* $477^{b}23$–$478^{a}10$.
440. Reading τῷ δὲ.
441. Reading ὡς ἔοικεν ἐπαμφοτερίζουσι.
442. Reading οὐδὲν οὔτε πεζὸν οὔτε πτηνὸν τὴν τροφὴν.

live when separated from the nature of water—for example, the so-called sea turtles, crocodiles, hippopotamuses, seals, and some of the smaller animals such as the freshwater turtle and the frog kind; for all of these, if they do not breathe during certain times, suffocate. Also, they give birth and rear their offspring on dry land, or in some cases near dry land, but spend their time in the water.

But the most remarkable of the animals in this regard is the dolphin, and any other of this sort there is either among the aquatic animals or among the other cetaceans that has this mode of life—for example, the whale and all the others that have a pipe. For it is not easy to class these either as aquatic only or as terrestrial only, if one must class those that take in air as terrestrial and those that take in water as aquatic in nature. For they partake of both; for they take in seawater, and discharge it through their pipe, and take in air with their lung. For they have this part and breathe. That is why, when it is caught in nets, the dolphin suffocates quickly because of not being able to breathe. Also, out of the water it lives a long time, moaning and groaning, like the other animals that breathe; further, when it is sleeping, it holds its snout above the water in order to breathe.

But to assign the same things to both divisions is absurd, since they are contraries; rather, it seems that one must further define what is aquatic. For while some take in water and discharge it due to the same cause as those that breathe air, for purposes of cooling, others do it on account of the nourishment; for they must get this in water and must take in the water at the same time, and the ones taking it in must have an instrument to eject it with. Those, then, that use water analogously to breathing have gills, while those blooded animals that take it in for nourishment have a pipe.[443] It is the same way with both the soft-bodied and the soft-shelled animals; for these also take in water on account of the nourishment.

Those that are aquatic in the other way, because of their body's blend and their life, are all those that take in air but live in the water, {or all those that take in water and have gills, but travel onto dry land and get nourishment; only one of this sort has been seen at present, the so-called water newt; for this, though it does not have lungs but gills, is four-footed, because it is in fact naturally terrestrial}.[444] The nature of all these seems as if it has been distorted, just as some males become female-like and some females male-looking. For by exhibiting a difference in their small parts, animals appear to differ greatly in the nature of their whole body. This is clear in the case of castrated animals; for after a small part has been disabled the animal changes toward the female. So it is also clear that if, in the composition that the animal has to start with, some very tiny part changes in size, if it has the form of a starting-point, the animal becomes, in the one case, a female and, in the other, a male, and if it is wholly done away with, neither. So too to be terrestrial and aquatic in both of the ways results from the change that occurs in small parts. That is why it happens that

443. I.e., a blowhole.

444. This conflicts with 589ª22–24, and so may be a later addition.

some animals become terrestrial and others aquatic. Also, some do not play a double game, while others do, because they partake of something of the matter that is in their composition, when they are coming to be, that is of the sort that they get their nourishment from; for each animal likes what is in accord with its nature, as was said previously.[445]

Since the animals have been divided into the aquatic and terrestrial in three ways (by taking in air or water, by the blend of their bodies, and third by the sorts of their nourishment), their lives follow along in accord with these divisions; for some animals, [their classification] follows along in accord with the blend and the nourishment and in accord with taking in water or air, while [the classification of] others follows along in virtue of the blend and [what sustains] their lives alone.[446]

Among the hard-shelled animals, those that are unmoving are nourished by the fresh water (for it is filtered through the coarse-grained parts because it is finer-grained than the seawater that is being concocted), just as they also received their coming to be from it at the start.[447] That there is fresh water in the sea and that it can be filtered in this way is evident; for some people[448] have actually made a test of this; for if one fashions a thin wax vessel, ties a cord around it, and lowers it into the sea empty, in a day and a night it takes in a quantity of water, and this water is manifestly fresh.[449]

The anemones nourish themselves on any small fish that strikes against them. They have their mouth in the middle; this is most clear to perception in the large ones. They also have, like the shellfishes, a duct through which [the residue of] the nourishment is passed out. The duct itself is up above; for the anemone seems to be like the fleshy inner part of the shellfishes, and it uses the rock as a shell.

The limpets too, when they detach themselves, go to other places to nourish themselves. Among the mobile hard-shelled animals, some are animal-eating and nourish themselves on small fishes—for example, the purpura (for it is carnivorous, which is why it is caught by baits of that sort); the others also nourish themselves on the plants that grow in the sea. **$590^{b}1$**

The sea turtles not only feed on the small shellfishes (for they have the strongest mouths of all; for whatever a sea turtle gets hold of, whether a stone or something else, it gnaws off and shatters), but also emerge from the water and feed on grass. They suffer and die when they are on the surface and get dried out by the sun; for they cannot easily descend again [into the water].

It is the same way too with the soft-shelled animals; for they are also omnivorous; for they feed on stones, mud, seaweeds, and excrement—for example, the rock crabs—and they are carnivorous. The crayfishes overpower even the large fishes, and

445. $589^{a}9$–10.
446. Since blend and nourishment must go together ($590^{a}8$–12).
447. *GA* 3.11.
448. Reading τισι.
449. *Mete.* $358^{b}35$–$359^{a}3$.

a sort of reversal[450] happens to some of these animals; for the octopuses overpower the crayfishes, so that if the crayfishes perceive them nearby in the same net, they die of fear. And the crayfishes overpower the conger eels; for because of their roughness the conger eels do not slip away from them. But the conger eels eat the octopuses; for the octopuses, because of their smoothness, cannot deal with them. (The soft-bodied animals are all carnivorous.) The crayfishes feed on the small fishes that hunt beside their lairs; for they occur in the deep seas in the sorts of places that are rough and stony; for it is in such places that they also make their lairs. Whatever the crayfish gets hold of, it conveys it to its mouth with its bipartite claw, like the crabs. It walks, in accord with nature, toward its front, when it is not frightened, with its antennas laid down at the sides; but when it has been frightened, it flees backward and projects its antennas out far. The crayfishes fight each other like rams with their horns, raising their antennas and striking with them. They are often seen together with each other and collected together like a herd. That, then, is the way the soft-shelled animals live.

Among the soft-bodied animals, the calamaries and the cuttlefishes overpower even the large fishes. The octopuses gather shellfishes mostly, extract the fleshy parts and nourish themselves on these; that is also why the fishermen recognize their lairs by the shells. But what some people say, that the octopus eats itself, is false; but some of them do have their tentacles gnawed off by conger eels.

The fishes all nourish themselves on the embryos,[451] when the normal times for these arrive, but the rest of the nourishment they get is not the same for all. For some of them are carnivorous only—for example, the selachians, the conger eels, the channas, the tunas, the sea bass, the dentex, the bonitos, the sea perch, and the muraena. The red mullets nourish themselves on seaweeds, shellfishes, and mud, and are carnivorous;[452] the gray mullets do so on mud, the *daskillos* on mud and excrement, the parrot wrasse and the melanurus[453] on seaweeds, the saupe fish on excrement and seaweeds (but it also feeds on prasion[454] and is the only fish caught with a gourd[455]).

All fishes, except the mullet, eat each other, especially the conger eels. The gray mullet and the mullet are, generally speaking, the only fishes that are not carnivorous. A sign of this is that they have never been caught with anything of this sort in the stomach, and the bait used for them is not animal flesh but barley bread. Every mullet nourishes itself on seaweed and sand. The gray mullet, which some call the *chelôn*, stays near the shore, but the *peraias* does not; the *peraias* feeds on its own mucus, which is why it is always hungry. The gray mullets feed on the mud, which is why they are heavy and slimy; they eat no fish at all. Because they spend their time in the mud, they frequently rise again after diving in order to wash off the slime. Their

450. *Po.* 1452ᵃ22–26.
451. Fish spawn.
452. Cf. 621ᵇ6–7.
453. The *Oblata melanura*.
454. Reading πράσιον. A sort of sea plant.
455. The gourd was used as a float with a line attached.

offspring are not eaten by any animal, which is why they occur in large numbers; but when grown, they are eaten by the other fishes and especially by the *acharnôs*. The most greedy and insatiable of all the fishes is the mullet, which is why its stomach is distended and, when it is not starved, is of poor quality. When it is frightened it hides its head, on the supposition that it is hiding its whole body.

The dentex is also carnivorous and eats the soft-bodied animals. Often both it and the channa throw out their stomachs[456] when pursuing the smaller fishes, because the stomachs of these fishes are next to their mouth, and they have no gullet.

Some fishes, then, as was said,[457] are carnivorous only—for example, the dolphin, the dentex, the gilthead, the selachian fishes, and the soft-bodied animals. Others, for the most part, feed on mud, seaweed, oyster-green, and so-called *kaulion*,[458] and plant material—for example, the *phukis*,[459] the goby, and the rock fishes; the *phukis*, though it does not touch other flesh, does eat that of the carids. Often, though, they also feed on each other, as was said,[460] that is, the large ones on the smaller ones. A sign of their being carnivorous is that they are caught with this sort of bait. The bonito, the tuna, and the bass are also mostly carnivorous, but also feed on seaweeds. The sargus feeds on the leavings of the red mullet, and when the red mullet has disturbed the mud (for it is able to dig) and gone away, the sargus descends and feeds, and prevents those weaker than itself from descending with it.[461]

It seems that the so-called parrot wrasse is the only fish to chew the cud like the four-footed animals.

In the case of the other fishes, they hunt the smaller ones that are right opposite their mouths in the direction that it is natural to swim in; but the selachians, the dolphins, and all the cetaceans catch them by turning their underneath parts up;[462] for their mouth is down below. That is also why the smaller fishes save themselves more readily; otherwise, it seems that there would be altogether few of them; for the dolphin's speed and capacity to eat seem wondrous.

Among the eels, a few, in certain places, nourish themselves both on mud and on foodstuffs, if someone throws them these, yet the majority do so on fresh water; and the eel farmers take care of this, seeing to it that it is as clean as possible, always flowing out and flowing in over flat stones; or else they have the eel tanks plastered. For the eels quickly suffocate if the water is not clean; for they have small gills. That is why, when people hunt for eels, they disturb the water; and in the river Strymon eels are caught at the rising of the Pleiades;[463] for then the water and mud are troubled

456. 507ª29.
457. 591ª9.
458. A sort of seaweed.
459. 567ᵇ19.
460. 591ª17.
461. Reading συνεπιβαίνειν.
462. The dolphin does not in fact do this.
463. In early May.

by winds occurring from contrary directions; otherwise, it is advantageous to give eel-hunting a rest.

When they are dead, the eels do not float on the surface, nor are they carried upward, like the majority of the fishes; for they have small stomachs. A few have fat, but most do not. When they are taken out of the water, they live for five or six days, for a longer period if there are north winds, for a shorter one if there are south ones. Also, if they are moved in the summer from the pools to the eel tanks they die, but in winter they do not. Also, they do not withstand changes that are violent—for example, if those carrying them happen to dip them into cold water; for often they are killed en masse. They also suffocate if they are kept in a small quantity of water. The very same thing also happens in the case of the other fishes; for they suffocate if they are always in the same small quantity of water, just as the animals that breathe do if air is enclosed and small in quantity. Some eels live for seven or eight years.

River fishes too get their nourishment by eating each other and by eating plants, roots, and anything they get hold of in the mud. They feed more during the night, while in the day they retreat into the depths.

As regards the nourishment of the fishes, then, this is the mode.

8.3
The Birds

Among the birds, the crook-taloned ones are all carnivorous and cannot swallow
592b1 grain even if fed by hand—for example, all the eagle kinds, the kites, both hawks,[464] both the pigeon hawk and the sparrow hawk (these differ greatly in size from each other), and the buzzard. The buzzard is the size of a kite and is seen throughout the year. Further, the bearded vulture and the vulture; the bearded vulture's size is greater than the eagle's;[465] its color is ashen; of the vultures there are two forms, one small and more whitish, the other larger and more ashen.

Further, among the night birds, some are crook-taloned—for example, the night raven,[466] the small owl, and the eagle owl. The eagle owl is in appearance like the little owl, but in size is no smaller than an eagle. Further, the *eleos*, the *aigôlios*, and the little horned owl.[467] Of these, the *eleos* is larger than a cock, the *aigôlios* is much the same size, and both hunt the jays. The little horned owl is smaller than the little owl. All three of these are alike in appearance and all are carnivorous.

Some of the non-crook-taloned birds are also carnivorous—for example, the swallow.

464. Cf. 9.36.
465. Cf. 619a12–13.
466. The horned owl, *Strix otus* (597b21–23).
467. 9.28.

Others are larvae-eaters—for example, the chaffinch, the sparrow, the *batis*, the greenfinch,[468] and the titmouse.[469] There are three forms of titmice: the finch titmouse is the largest (for it is the size of a chaffinch); another is the mountain titmouse (because it spends its time in the mountains), which has a long tail; and the third is like these, but differs from them in size; for it is the smallest. Further, the beccafico, the black cap, the bullfinch, the robin, the *epilais*, the *oistros*, and the *turannos*, which is a little larger than a locust, has a crimson crest, and is otherwise a charming and graceful little bird. The *anthos*: this bird is the size of a chaffinch. The mountain finch: this one is like a chaffinch, and much the same size, but has blue on its neck; it spends its time in the mountains. Further, the king bird,[470] and the rook. These then and birds of this sort are wholly, or for the most part, larvae-eaters.

The following are thorn-eaters: the *akanthis*,[471] the *thraupis*, and the goldfinch. For all these feed on thorns, but never on larva or on any other animate thing; they sleep and feed in the same place.

Others are the *sknipe*-eaters; they live mostly by hunting *sknipes*[472]—for example, the greater and the lesser pie; some call these "woodpeckers"; they are like each other, and have a similar voice, except that the greater pie's is larger; they both feed by flying onto tree trunks. Further, the green woodpecker: the green woodpecker is the size of a turtledove and is entirely green in color; it is a vigorous pecker of wood, and feeds mostly on the tree trunks; it has a large voice. This bird occurs mostly around the Peloponnese. Another is called the "*sknipe*-picker"; it is as small as the *akanthullis*,[473] and ashen and speckled in color; its voice is small; it too is a pecker of wood.

There are others that live by eating fruit and herbage—for example, the wood pigeon, the common pigeon, the wine-colored pigeon, and the turtledove. The wood pigeon and the common pigeon are seen all the time, the turtledove[474] in summer; for in winter it vanishes; for it goes into hiding. The wine-colored pigeon is both seen and caught mostly in fall. In size the wine pigeon is larger than the common pigeon but smaller than the wood pigeon; the catching of it mostly occurs when it is gulping down water. They arrive in these places with their offspring. All the other birds that arrive in summer build their nests here; and most rear their offspring on live animals, except the pigeon-like ones.

Among (one might almost say) all the birds, some search for their nourishment on land, others live around rivers and lakes, others around the sea; all the web-footed ones spend most of their time on the water itself, those that are split-footed beside the water itself; among these, some nourish themselves on plants (those that are not

468. $615^{b}32$–$616^{a}4$.
469. $616^{b}3$–9.
470. Another name for the wren.
471. $610^{a}4$–5, $616^{b}31$–32.
472. Small insects found under the bark of trees. See $614^{b}1$.
473. $616^{a}4$–6.
474. Cf. $597^{b}4$, $600^{a}20$–22, $613^{b}2$–3.

593b1 carnivorous). For example, those around lakes and rivers: the heron and the white heron; the latter is smaller than the former in size, and it has a beak that is flat and long. Further, the stork and the gull; the gull is ashen in color. Also, the *schoinilos*, the *kigklos*,[475] the *truggas*;[476] it is the largest of these smaller birds; for it is the size of a thrush. These birds all move their tails. Further, the *skalidris*; this bird is variegated, but overall ashen. Also, the halcyon kind lives near water. There are in fact two forms of these: one sings while settling in the reeds, the other is voiceless; it is larger; both have blue on the back. Also, the crocodile bird.[477]

Around the sea: both the halcyon and the *kêrulos*.[478] Also, the crows feed by taking animals that are washed up on the shore; for the crow is omnivorous. Further, the white gull, the *kepphos*,[479] the *aithuia*,[480] and the *charadrios*.[481]

Among the web-footed birds, heavier ones are around the rivers and lakes—for example, the swan, the duck, the *phalaris*, the grebe; further, the teal, which is like the duck but smaller in size, and the so-called raven;[482] it is like the stork in size, except that it has shorter legs; it is web-footed, a capable swimmer, and black in color; alone among birds of this sort, it settles in trees and builds its nest there. Further, the goose, the small gregarious goose, the Egyptian goose, the *aix*, and the *pênelops*.

The sea eagle spends its time around the sea and seeks prey in lakes.[483]

Many birds are also omnivorous. The crook-taloned ones take any other animal they can overpower, including birds; except that they do not eat members of their own kind, in the way that the fishes often take even their own.

The entire bird kind drinks little, while the crook-taloned ones do not drink at all,
594a1 except for a small kind and these only rarely. The kestrel is especially of this sort. The kite also drinks rarely, but has been seen drinking.

8.4
The Hard-Scaled Animals

The hard-scaled animals—for example, the lizard and the other four-footed ones, and the snakes—are omnivorous; for they are both carnivorous and eat herbage. The snakes are also the most gluttonous of the animals.

475. 615a22–24.
476. Reading ὁ τρύγγας.
477. As at 612a21; not the wren (also *trochilos*) as at 609b12, 615a17.
478. Perhaps a sort of halcyon.
479. 9.35. Perhaps the stormy petrel.
480. 542b17.
481. Perhaps the plover.
482. The cormorant.
483. Cf. 620a5–7.

These animals also drink little, and so do all the others that have their lung spongy; and all ones with little blood and the egg-laying animals have a spongy one. The snakes also lack self-control in regard to wine, which is why some people hunt even vipers by putting out wine in little pots in dry-stone walls; for they are caught when drunk.

The snakes are carnivorous, and whatever animal they catch, they suck dry and eject whole with their excrement. It is pretty much the same with the other animals like this—for example, the spiders; but the spiders suck out the juices outside, while the snakes do so in their stomach.

The snake takes from whatever is presented to it (for it eats small birds and beasts, and gulps down eggs), and, after taking it, the snake draws back until it is set in a straight line to its extremity, and then it draws itself in and contracts into a small space in such a way that, when it has stretched out, what it has gulped has gone down [into its stomach]. It does this because its gullet is thin and long. Both venom-spiders and snakes are capable of living a long time without food; this may be observed from the animals that the medicine-makers rear.

8.5
The Wild Sawtoothed Animals

Among the live-bearing four-footed animals, those that are wild and sawtoothed[484] are all carnivorous; except that the wolves, they say, eat a certain sort of earth when hungry, and are the only animals to do so. These animals do not touch herbage, but when they are ill, just like the dogs also do,[485] they eat it, vomit, and purge themselves.

Among the wolves themselves,[486] the ones hunting alone are more likely to eat human beings than those hunting in packs.

The animal that some people call the *glanos* and others the "hyena" is in size no smaller than a wolf, but has a mane like a horse, but with hair that is harder, denser, and extends along the whole spinal column. It plots against and hunts human beings, **$594^{b}1$** and it hunts dogs by making sounds like human beings vomiting;[487] also, it digs up graves because of its longing to eat this sort of flesh.

The bear is omnivorous. For it eats both fruit (climbing up into trees in virtue of the suppleness of its body) and legumes; it also eats honey (after breaking into the beehives), crabs, and ants, and is carnivorous. For because of its strength it attacks not only deer but also wild pigs (if it is able to fall upon them unawares), and bulls; for it advances toward the bull and, when it is in front of him, falls over on its back, and, when the bull tries to strike, it catches him around the horns with its front legs, and,

484. $501^{a}18–19$.
485. $612^{a}5–7$.
486. Retaining αὐτῶν.
487. Presumably the dogs are attracted by the prospect of having vomit to eat.

by biting his shoulder with its mouth, throws the bull down. It can walk for a short time upright on two legs. All the flesh it eats, it first lets putrefy.

The lion is carnivorous like all the other animals that are wild and sawtoothed. It deals violently with its meat, and gulps down much of it whole without cutting it up, and then does not eat for two or three days; for it is able to do this because it is overfull. It drinks little. It discharges residue rarely; for it passes it on the third day or whenever it happens to be, and it is hard and dry, like a dog's. It also discharges wind that is very acrid, and its urine has an odor, which is why, like the dogs, it sniffs at trees; for it urinates by lifting its leg like the dogs. It also produces a heavy odor in what it is eating by breathing on it; for when it is opened up its inside also releases a heavy vapor.

Some wild four-footed animals get their nourishment around lakes and rivers; but none does so around the sea, except the seal. Animals of this sort include the so-called *kastôr*,[488] the *satherion*, the *saturion*, the otter, and the so-called *latax*; it is broader than the otter, and its teeth are strong; for, coming out at night, it often cuts down the aspen around the river with its teeth. The otter also bites human beings and does not let them go, so they say, until it hears the bone crack. The *latax* has hard hair, and its appearance is intermediate between the hair of the seal and that of the deer.

8.6
Modes of Drinking; The Pigs

The sawtoothed animals drink by lapping; so also do some that are not sawtoothed—for example, the mice. But those with teeth that meet drink by suction—for example, the horses and the cows. The bear, though, drinks neither by suction nor by lapping but by gulping. Among the birds, all drink by suction, except that the long-necked birds at intervals raise their head; the *porphuriôn* alone does so by gulping.

The horned animals, both tame and wild, and all that are not sawtoothed, are grain-eaters and herbivores, unless very overcome by hunger, except the pig; for it is least of all a herbivore and a grain-eater. The pig, among all animals, is most a root-eater because its snout is naturally well adapted for doing this work;[489] among the animals, it has the strongest stomach for every sort of nourishment. It is also the quickest to increase in fatness in proportion to its size; for it fattens up in sixty days. The amount of the increase is something those who busy themselves about these matters come to know by weighing the pig when it is starving. Before being fattened, it is first starved for three days (pretty much all the other animals are also starved before being fattened). After three days, those fattening the pigs feed them well. The Thracians fatten them by giving them something to drink on the first day, then they

488. Probably the beaver.
489. *PA* 694^b13–14.

leave an interval of one day the first time, after that two, then three, then four, up to seven days. This animal is fattened on barley, millet, figs, acorns, wild pears, and cucumbers. But keeping still is what most fattens these, and other animals that have warm stomachs; and, in the case of pigs, wallowing in the mud too. They like to feed in groups of the same age. The pig fights even with the wolf. A sixth of its live **$595^{b}1$** weight goes into its hair, blood, and things of this sort. Sows and all other animals get thinner when they are suckling.

Of these matters, then, this is the mode.

8.7
The Cows

The cows eat both grain and herbage, but are fattened on the wind-producing vegetables, such as bitter vetches, bruised beans, bean stalks, and, in the case of older animals, if, having cut into their skin, one inflates them, and after that offers the nourishment; further, on barley, both simply as it is and winnowed, and on sweet foods, such as figs and raisins, and on wine and elm leaves. But, above all, they are fattened by sunny days and warm baths.[490]

The horns of young cows, when warmed with wax, easily go in whichever direction one pleases; they suffer less with their feet if one smears the horny parts with wax, oil, or pitch. When being moved, the herds suffer more from frost than from snow.

Cows grow larger when they remain unmated for several years; that is why in Epirus they keep the so-called Pyrrhic cows[491] unmated for nine years, calling them "apart from the bull," when they are growing. They say that these cows number around four hundred, are the private property of the kings, and are unable to live in any other region; and yet some people have tried this.

8.8
The Horses, Mules, and Asses

The horses, the mules, and the asses are grain-eaters and herbivores, but are fattened above all by their drink; for as the beasts of burden drink water, so they are too as regards the enjoyment they take in their nourishment, and where drinking displeases them least is where this is more fattening. Green pasture, when it is full of seed, makes them have smooth hair; but when it has hard awns, it is not good. The first cut of the Median grass[492] is bad, as is the grass anywhere that is supplied with foul-smelling water; for it scents the grass.

490. These help to concoct or digest the food.
491. $522^{b}23–25$.
492. $522^{b}26$.

The cows look for clean water to drink, while the horses are like the camels; the camel drinks with pleasure water that is turbid and coarse-grained; indeed, it does not **596ᵃ1** drink from rivers without having stirred them up. It is able to hold out for up to four days without drinking; then, after that, it drinks a large quantity.

8.9
The Elephants and Camels

The elephant[493] eats at most nine Macedonian medimni[494] of barley at one meal; but so large a quantity is dangerous. Normally it eats six or seven medimni, five medimni of hulled barely seeds, and five mareis of wine (a maris is six *cotyles*). An elephant has been observed to drink fourteen Macedonian metretae of water at one time, and eight more again that afternoon.

Most camels live for around thirty years, some much longer; for they even live for up to one hundred years. But the elephant, some people say, lives for around two hundred years, others say three hundred.

8.10
The Sheep and Goats

The sheep and the goats are herbivores, but the sheep get their pasturage by being persistent and staying in one place, while the goats change places quickly and touch only the tops of the plants. What most fattens the sheep is what it drinks, that is why in summer people give then salt every five days, a medimnus per one hundred animals; for this makes the flock healthier and fatter. Also, because of this they salt most of the food they offer—for example, they put a lot of salt in the bran (for when thirsty, they drink more) and in fall they sprinkle the gourd with salt; for this also increases the milk [they produce]. Also, if they are kept moving at midday, they drink more toward evening. Also, when they are ready to give birth, ewes fed with salt let down bigger udders.

One also fattens sheep on young olive shoots, wild olive, vetch, and bran of any sort; all fatten more when sprinkled with brine. These animals too[495] fatten more if they are first starved for three days. In fall, water from the north[496] is better for sheep than water from the south, and pastures that face west are advantageous; but travels and hardships make them thin.

493. 9.46.
494. An uncertain quantity. An Attic medimnus ≈ fifty-two liters.
495. 595ᵃ22–24.
496. Perhaps water facing into the north wind, or else rain driven by it.

In winter, the shepherds recognize the strong ewes by the fact that they have frost on them, while the other ones do not have it; for, because of their weakness, the ones that are not strong move around and throw it off. **$596^{b}1$**

The flesh of all the four-footed animals is worse in places where they graze on marshy ground than in places where they graze on more lofty ones.

The broad-tailed sheep winter better[497] than the long-tailed ones, and the short-wooled more than the shaggy; but the goats[498] actually winter badly. The sheep, in any case, are healthier than the goats, though the goats are stronger than the sheep.

The fleeces and the wool of sheep that have been eaten by wolves, and the clothes made from them, are much more infested with lice than the others.

8.11
The Insects

Among the insects, those that have teeth are omnivorous, while those that have only a tongue nourish themselves on liquids, sucking out juice with it from all quarters. Some of these are omnivorous (for they have a taste for all the juices)—for example, the flies; others are bloodsuckers—for example, the horsefly and the gadfly; and others live on the juices of plants and fruits. The bee is the only one that neither settles on anything putrefying nor takes any nourishment except what has a sweet taste. They take water for themselves with the greatest pleasure where it springs up pure.

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The sorts of nourishment taken by the animal kinds, then, are the ones that have been stated.

8.12
Migration: Birds

The actions[499] of these animals are all concerned with mating and the production of offspring, with the easy means of providing nourishment, or are contrived with an eye to periods of cold and of heat and the changes of the seasons. For all animals have an innate perception of change as regards heat and cold, and just as among the human beings some change to living in their houses in winter, while others who control a large territory spend the summer in the cold parts and the winter in the warm ones, so it is too with those animals that are able to change their places.

497. Reading εὐχειμερώτεραι.
498. Reading αἶγες.
499. $589^{a}2$–5.

Some of them find protection in their own accustomed places, while others migrate: after the fall equinox, they flee from the Black Sea and the cold places to escape the approaching winter; after the spring one, they flee from the warm places to cold ones for fear of hot spells. Some make the change from nearby places, but others do so from (one might almost say) the furthest extremes, as the cranes do; for they move from the Scythian plains to the marshes above Egypt from which the Nile flows; this is also where the Pygmies live; for they are no myth, but there truly is a kind that is small, as was said, both of the people and their horses, and they live in holes. The pelicans also migrate; they fly from the river Strymon to the Ister and give birth there. They depart in a gathering, those in front waiting for those behind, because, when they have flown over the mountain, those in front are invisible to those behind.

The fishes are the same way: some move out of the Black Sea and back into the Black Sea; others move in winter from the deep sea toward the land, pursuing the heat, and, in summer, from inshore to the deep sea, fleeing the heat.

Also, the weak [kinds] of birds, in winter and times of frost, come down to the plains for the heat, but in summer go back to the mountains above because of the hot spells. It is always the weaker ones that are first to make the move at each excess—for example, the mackerels before the tunas, and the quails before the cranes; for the former move in Boedromion, the latter in Maemacterion.[500]

All are fatter when they move from the cold places than from the warm ones—for example, the quails are fatter in fall than in spring. The move from the cold places happens at the same time as the hot season finishes. Also, they have more of an impulse to mate in the spring season and when they move from the warm places.

Among the birds, the cranes, as was said previously,[501] migrate from the furthest extremes to the furthest extremes. They fly against the wind. But the story about the stone is false; for it is said that they contain a stone as ballast, which when they vomit it up is useful for testing gold.

Both the wood pigeons and the rock pigeons depart, and do not winter here. So also do the swallows and the turtledoves;[502] but the common pigeons remain here. Similarly, quails depart too, except for any turtledoves and quails that remain in sunny places. The wood pigeons and the turtledoves herd together, both when they arrive and again at the season for departure. When the quails have descended, if the weather is good or there is a north wind, they form couples and are quiet,[503] but if there is a south wind, they have difficulties because of not being flyers; for the wind is wet and heavy; this is also why hunters try to get them during south winds. In good weather they do not fly well because of their weight; for their body is large. That is why they cry when flying; for they are suffering. When they come to land

500. Around September, in the one case, October, in the other.
501. 597ᵃ4–6.
502. Cf. 593ᵃ17–18, 600ᵃ20–22, 613ᵇ2–3.
503. Reading ἠρεμοῦσιν.

from overseas, they do not have leaders; but when they depart from here, the *glottis* departs with them, together with the mother quail, the horned owl, and the *kuchramos*, which is precisely the one that also calls them in the night. When the hunters have heard its voice, they know that the quails are not remaining here. The mother quail is much the same as the marsh birds in shape, and the *glottis* has a tongue that it puts out a long way. The horned owl is similar to ordinary owls and has plumicorns by the ears; some people call it the "night raven." It is mischievous and an imitator, and, while imitating the dance [of one hunter], is caught by the second of the two hunters going around behind it, just like the ordinary owl.

In general, all the crook-taloned birds are short-necked, flat-tongued, and imitative; for the Indian bird, the parrot, which is said to be "human-tongued," is also of this sort; it becomes even more undisciplined after drinking wine.

The birds that live in herds include the crane, the swan, the pelican, and the small goose.

8.13
Going into Hiding: Fishes

Among the fishes, as was said previously,[504] some move toward the land from the deep sea, and to the deep sea from the land, fleeing the excesses of cold and heat. Those **598ª1** that occur inshore are better than those in the deep sea; for they have more and better food to feed on; for where the sun falls, the plants grow in greater abundance and are better and more tender, as in gardens. And the black shoreweed[505] grows near the land, while the other sort is like the wild plants. Further, the places in the sea that are inshore succeed in blending hot and cold well; that is also why, in fishes of this sort, the flesh is more firm in composition, while that of the deep-sea fishes is watery and flaccid.

The inshore fishes are the dentex, the black bream, the sea perch, the gilthead, the mullet, the red mullet, the wrasse, the weever fish, the *kalliônumos*,[506] the goby, and all the rock fishes. The deep-sea ones are the stingray, the selachians, the white conger eels, the channa, the erythrinus, and the *glaukos*. The sea bream, the scorpion fish, the black conger eels, the muraenas, and the cuckoo fish play a double game. And there are differences among these fishes also with respect to their places—for example, around Crete the gobies and the rock fishes all become fat. The tuna becomes good

504. $597^{a}13$–17.

505. Omitting the lacuna. A *this* is a sandbank at $537^{a}25$ and $548^{b}6$, but here seems to be a sort of marine plant.

506. Perhaps the stargazer, *Uranoscopus scaber*.

again after Arcturus;[507] for the gadfly[508] ceases in this season; for it is because of this it is worse in summer.

Many of the fishes also occur in sea-lagoons—for example, the saupe fish, the gilthead, the red mullet, and pretty much most of the others. The bonitos also occur there—for example, around Alopeconnesus; and in the Bistonis lake most of the fish kinds are present.

Many of the coly-mackerels do not enter the Black Sea, but summer in the Sea of Marmora, give birth there, and winter in the Aegean. The tunas, the young tunas, and the bonitos enter the Black Sea in spring, and summer there, and so do pretty much most of the fishes that go in shoals with the current and live in herds. Most fishes live in herds. And all the ones that live in herds have a leader. They all swim into the Black Sea for the nourishment; for the feeding is both more abundant and better because of the fresh water and the large savage fishes are fewer (for apart from the dolphin and the porpoise there is none in the Black Sea, and the dolphin is small; but immediately on leaving the Black Sea there are large ones). They swim in, in fact, both for the nourishment and for giving birth; for there are places suitable for giving birth, and the fresh and sweeter water nourishes the embryos. And when they have given birth and the offspring have grown, they swim out immediately after the Pleiades.[509] If the winter wind is a south wind, they swim out more slowly, if it is a north one, they do so more quickly, because the wind assists their movement. Also, the offspring caught then around Byzantium are small, because they have not spent much time in the Black Sea.

The others are clearly seen both swimming out and swimming in; the *trichias*[510] are the only fishes that are caught swimming in, but are not seen swimming out; in fact, when one is caught around Byzantium, the fishermen purge[511] their nets completely because it is not an ordinary thing for them to swim out. The cause is that these are the only fishes that swim up into the Ister, and then, where it divides, they swim down into the Adriatic.[512] A sign of this is that there the contrary happens; for they are not caught swimming into the Adriatic, but are caught swimming out.

The tunas swim in keeping to the right-hand shore, but swim out keeping to the left-hand one. Some say they do this because they see more sharply with the right eye, but by nature are not sharp-sighted.

The fish that go in shoals with the currents travel by day, but at night they rest and feed if there is no moon; but if there is one, they travel and do not rest. Some who live

507. Its morning rising in mid-September.
508. 557[a]27–28.
509. Probably its morning setting in early November.
510. 569[b]25.
511. To render them pure in the religious sense. Catching a *trichias* is taken as a potentially bad omen.
512. The Ister and the Adriatic were thought to connect.

around the sea say that when the winter solstice occurs, these fishes no longer move but stay at rest wherever they happen to have arrived, until the equinox.

The coly-mackerel are caught swimming in, but less often leaving. They are best in the Sea of Marmora before giving birth. The other fishes that go in shoals with the currents are caught more while leaving from the Black Sea and are best then. When they are swimming in, those caught nearest the Aegean are fattest, while the further up they are, the thinner they get. Often too, when a south wind resists the **599^{a}1** coly-mackerel and the mackerel as they swim out, one catches them further down more than around Byzantium.

This, then, is the mode in which the fishes make their migrations.

The same affection also occurs in the land animals in regard to going into hiding; for they have an impulse to go into hiding in winter and to quit their hiding place in the warmer season. The animals also go into hiding for aid against the excesses of either of the two seasons. In some cases, the whole kind goes into hiding; in others, some do, others do not. For the hard-shelled animals all go into hiding—for example, the ones in the sea: purpuras, trumpet-shells, and all of that kind. Going into hiding is more noticeable in the case of the detached animals (for they hide themselves, like the scallops, or they have an operculum on top of them, like the land snails), but in the undetached animals the change is invisible. They do not go into hiding in the same season, but rather the snails in winter, the purpuras and trumpet-shells at the Dog Star,[513] for around thirty days, and the scallops around the same time. And most of them also go into hiding in very cold spells and in very hot ones.

8.14
Going into Hiding: Insects

The insects pretty much all hide, except for any that live with human beings in houses, as well as those that die and do not live for more than a year. The others go into hiding in winter. Some go into hiding for a large number of days, others for the wintriest ones—for example, the bees; for these also go into hiding. A sign of this is that they are not seen to taste any of the nourishment set out for them; and if one does creep out, it appears transparent, and it is clear that there is nothing in its stomach. The bees are quiet from the setting of the Pleiades[514] until spring.

The animals go into hiding by hiding themselves in warm places and in places where they habitually sleep.

513. The morning rising in mid-July.
514. The morning setting in early November.

8.15
Going into Hiding: Blooded Animals and Fishes

Many of the blooded animals—for example, the hard-scaled ones, the snakes, the lizards, the geckos, and the river crocodiles—also go into hiding for the four wintriest months, and do not eat anything. The other snakes go into hiding in the earth, but
599ᵇ1 the vipers hide themselves under rocks.

Many of the fishes go into hiding too, most noticeably the *hippouros* and the sea crow in winter; for these are the only ones that are not caught anywhere except at certain fixed times that are always the same. Pretty much all the rest go into hiding.[515] The muraena, the sea perch, and the conger eel also go into hiding. The rock fishes form couples, males with females, when they go into hiding, just as for giving birth to offspring—for example, the wrasses, the *kottuphos*, and the perch. The tunas also go into hiding during winter in deep waters, become fattest after hiding, and start to be hunted from the rising of the Pleiades until the setting of Arcturus[516] at the latest. The rest of the time they stay quiet hiding. But some of these too, as well some other fishes that go into hiding, are caught during the time of going into hiding, since they move, if the place is warm and the weather is unexpectedly good; for they emerge from their lair for a little while to feed; they also do so at times of a full moon.

Many fishes are most pleasant tasting when in hiding.

The one-year-old tunas hide themselves in the mud; a sign of this is the fact that they are not caught, and also that they appear with a lot of mud on their back and with their fins pressed in. But in the season just mentioned,[517] they start moving and proceed toward land to mate and give birth, and they are caught pregnant. That is when they are believed to be in season; the fall and winter ones are believed to be inferior. At the same time too the males are seen to be full of seminal fluid. When the embryos they contain are small, these fish are difficult to catch, but when they are bigger, many are caught because of the gadfly.[518]

Some fishes go into hiding in the sand, others in the mud, with only their mouth projecting.

Most fishes go into hiding only in the winter, while the soft-shelled animals, the rock fishes, the rays, and the selachians do so only during the wintriest days; this is made clear by their not being caught when it is cold.

But some of the fishes go into hiding during the summer too—for example, the *glaukos*; for it goes into hiding in summer for around sixty days. The hake and the gilthead also go into hiding; and it seems to be a sign of the hake going into hiding
600ª1 for a very long time that it is caught at very long intervals.

515. Reading φωλεῖ.
516. Early May–late October.
517. The rising of the Pleiades in early May (599ᵇ10). Reading εἰρημένην.
518. 557ª27–28.

A sign of the fishes too going into hiding during the summer seems to be that catches are made at "the stars,"[519] and especially at the Dog Star; for at these times the sea is most stirred up. It is precisely in the Bosporus that this is well known; for the mud comes up to the surface and the fishes are carried up with it. They say too that often when the bottom of the sea is dragnetted more fishes are caught in the same net the second time than the first. And when there have been large storms, many [marine] animals appear that have previously not been seen at all or not often.

8.16
Going into Hiding: Birds

Many of the birds go into hiding too, and it is not the case, as some people think, that all migrate to warm places. On the contrary, some whose places of permanent residence are near places of this sort—for example, the kites and the swallows—depart to these; others that are further away from such places do not migrate but rather hide themselves. For many swallows have been seen in sheltering places altogether featherless, and kites have been seen flying out of such places when they first appear.

There is no distinction in going into hiding between the crook-taloned and straight-taloned birds; for the stork, the blackbird, the turtledove, and the lark go into hiding; in fact, the turtledove[520] is the most commonly assented to case of all; for no one (one might almost say) has been said to see a turtledove anywhere in winter. When it starts its going into hiding it is very fat, and though it molts during hiding, it nonetheless remains fat.

Among the wood pigeons, some go into hiding, and some do not go into hiding, but depart at the same time as the swallows. The thrush and the starling also go into hiding, and among the crook-taloned birds, the kite goes into hiding for a few days, also the owl.

8.17
Going into Hiding: The Four-Footed Animals

Among the live-bearing four-footed animals, both the porcupines and the bears go into hiding. That the wild bears go into hiding is evident, but whether due to the cold or due to some other cause is disputed. For around this time the males and the females become very fat, so that they cannot move easily. The females also give birth around this time, and go into hiding until it is time to bring out the cubs; this she does in spring, around the third month after the solstice. The bear goes into **$600^{b}1$**

519. $568^{a}18$.
520. Cf. $593^{a}17–18$, $597^{b}4$, $613^{b}2–3$.

hiding for at least around forty days; of these there are fourteen, they say, in which it does not move at all, but on most of the following ones, though it is still in hiding, it moves and wakes up. A pregnant bear has either never, or else very rarely, been caught. During this time it is evident that the bears eat nothing; for they do not emerge, and when they are caught, their stomach and intestines are seen to be empty. It is also said that because nothing goes into it, the intestine almost grows together, and because of this, when a bear first emerges, it eats arum in order to separate and dilate the intestine.

The dormouse too goes into hiding inside the trees themselves, and becomes very fat then; also, the white mouse from Pontus.[521]

Some of the animals that go into hiding also cast off their so-called old age;[522] this is the outermost skin and the sheath around the developing animals.[523] Among the terrestrial live-bearing animals, the cause of the bear's going into hiding is disputed, as was said previously.[524] Among the hard-scaled ones, though, pretty much most go into hiding, and those of them whose skin is soft and do not have a shell like that of the turtle (for both the land turtle and the freshwater turtle are among the hard-scaled ones) cast off their old age—for example, the gecko, the lizard, and above all the snakes; for they cast it off both in spring when they emerge and again in fall. The vipers also cast off their old age in spring and fall, and it is not the case, as some say, that this is the only kind of snake not to cast it off. When the snakes start to cast it off, it comes away first from the eyes in all cases, so that they seem to be becoming blind to those who do not understand the affection of casting off; after that, it comes off the head, which appears white in all snakes. The entire old age is stripped off in around a night and a day, starting from the head and ending at the tail. While the snake is casting it off, its inner layer becomes the outer; for it casts it off like fetuses
601ᵃ1 emerging from their chorions.

Those insects too that cast off their old age cast it off in the same way—for example, the cockroach, the *aspis*,[525] and the coleopterans—for example, the dung beetle. All cast it off after developing; for as with the chorion in those born to live-bearing animals so it is also with the sheath in those born to larvae-generating ones, alike in both the bees and the crickets. The cicadas, when they have emerged, settle on olive trees and reeds. They emerge when the sheath has broken open, leaving behind a little liquid, and not a long time afterward, they fly up and sing.

Among the marine animals, the crayfishes and the lobsters cast off their old age in spring and sometimes in fall after giving birth. Cases have been observed of crayfishes being caught in which the parts around the thorax are soft, because their shell has broken off, while the lower parts are hard, because it has not yet broken off there;

521. Perhaps the marmot.
522. 549ᵇ26.
523. 601ᵃ1.
524. 600ᵃ28–30.
525. Reading ἀσπὶς as at 487ᵇ5.

for they do not do their casting off in the same way as the snakes.[526] (The crayfishes go into hiding for around five months.) The crabs also cast off their old age, the soft-shelled ones by common consent, but they say that the hard-shelled ones do it too—for example, the *maia*.[527] When they are casting it off, the shell becomes altogether soft, and the crabs, at any rate, are hardly able to walk. Animals of this sort cast off not once but many times.

All the animals that go into hiding, both when they do so and how they do so, and further, which ones cast off their old age and when, have now been spoken about.

8.18
The Influence of Climate on the Birds

The animals do not all thrive in the same seasons, nor do they all do so equally in extreme weather conditions; further, states of health and sickness vary with the seasons in distinct ways in animals of distinct kinds, and, in general, are not the same for all.

Dry conditions are advantageous for the birds, both for their other health and for giving birth, not least for the wood pigeons, while rainy ones are so for the fishes, except for a certain few. And on contrary in each case, rainy years are disadvantageous for the birds (for, in general, it is not even advantageous for them to drink much), dry ones for the fishes. The crook-taloned birds, as was said previously,[528] generally speaking do not drink at all (but Hesiod[529] was ignorant of this; for in his poem narrating the siege of Ninus the eagle that presides over prophecy is drinking). The other birds drink, but are not big drinkers; nor, likewise, are any of the egg-laying animals that have a spongy lung.

Ailments in birds are noticeable in their plumage; for it is disturbed and does not have the exact same orderliness as when they are healthy.

8.19
The Influence of Climate on the Sea Fishes; Their Diseases

Most of the fish kind thrive more, as was said previously,[530] in the rainy years; for they not only have more abundant nourishment then, but also rainy weather is, in general, advantageous, as it is also to what grows from the earth; for garden vegetables, even

526. $600^{b}27–30$.
527. $525^{b}4$.
528. $593^{b}29–594^{a}1$.
529. There is no such passage in Hesiod. Some mss. read "Herodotus" in place of "Hesiod," others "Homer."
530. $601^{a}28–29$.

if irrigated, nonetheless benefit more from rain. The same happens to the reeds that grow in the marshes; for one might almost say that they do not grow at all unless rains occur. A sign of this is that most fishes migrate to the Black Sea in summer; for, because of the number of rivers, the water is sweeter, and the nourishment the rivers bring down plentiful. Further, many of the fishes even swim up the rivers and thrive in rivers and in lakes—for example, the bonito and the mullet. The gobies also become fat in rivers; and, in general, the regions that are well supplied with lakes have the best fishes. As for the rains themselves, summer rains are more advantageous for most fishes; also, when spring, summer, and fall have become rainy, but the winter is good. Generally speaking, when the season is good for the human beings, it turns out to be that most fishes thrive then too.

In cold places, on the other hand, they do not thrive. And the ones that suffer most in winters are those with a stone[531] in the head—for example, the *chromis*, the bass, the *skiaina*, the braize;[532] for because of the stone they become solidified due to the cold and are cast ashore.

Though rain is more advantageous for most fishes, for the mullet, the gray mullet, and the fish that some call the *marinos*, it is the contrary; for most of them are quickly blinded by heavy rains, if these are excessive. The gray mullets usually suffer this more in winters; for their eyes become white; when they are caught then, they are thin; and in the end are altogether destroyed. But it seems that it is not principally due to the heavy rain that they suffer this, but rather due to the cold; at any rate, many cases have been observed, in various places and especially in the willows around Nauplia in the Argolid, of blind fishes being caught after severe cold; many have been caught, in fact, that have white eyes. The gilthead also suffers in winter, and in summer the *acharnôs*, and they become thin. But for the crowfishes, in contrast to (one might almost say) all other fishes, dry years are more advantageous; in their case, though, it is because heat occurs more in dry ones.

Places are advantageous for each kind of fish for thriving. All those that are by nature inshore fishes or deep-sea fishes thrive in one or the other of these, while those that play a double game, do so in both; but there are also certain places special to each kind, in which they thrive. Generally speaking, places full of seaweed are advantageous; at any rate, among those fishes that feed in all sorts of places, those caught in the ones full of seaweed are fattest; for the seaweed-eaters are well provided with nourishment, and the flesh-eaters meet with more fishes.

North winds and south winds also make a difference; for the large fishes thrive more in north winds; and in summer, at the same location, more fishes are caught that are large and broad.[533]

531. The otolith.

532. *Pagrus pagrus*.

533. Alternatively (reading ἢ τῶν πλατέων and translating μακρὰ as "broad"): "for the long fishes thrive more in north winds; and in summer, at the same location, more long fishes are caught than broad ones."

The tunas and the swordfishes are driven mad by gadflies at around the rising of the Dog Star;[534] for at that time they both have beside their fins a sort of small larva that is called a "gadfly," which is like a scorpion, but the size of a spider; these produce such pain that sometimes the swordfish leaps out of the water no less high than the dolphin; that is also why they often fall onto ships. Among the fishes, the tunas most enjoy the warmth, and go toward the sand by the shore for the sake of warmth, and because they get hot, they come up to the surface. **$602^{b}1$**

Among the small fishes, their little ones survive due to being overlooked; for it is the larger ones that the large fishes pursue. Of the eggs and the seminal fluid most perish because of the sources of heat; for what they touch, they ruin all of.[535]

The fishes are mostly caught before sunrise and after sunset, and, in general, around the times of the sun's setting and rising; for these are the times said to be "ripe" for throws with the casting net, which is why fishermen take up their nets at that time. For the fishes are most deceived by their sight at these times; for they are quiet at night, and see better as the light increases.

No pestilential disease is seen to attack any of the fishes, such as often occurs in the human beings and, among the live-bearing four-footed animals, in the horses, the cattle, and certain others, both tame and wild; however, they certainly seem to get sick. Fishermen are given proof of this by some fishes being caught that are thin, sickly looking, and have changed color in among many of the same kind that are fat when caught.

As regards the sea fishes, then, this is the mode [of climatic influence].

8.20
Diseases of River and Lake Fishes; Influence of Climate

In the river and lake fishes, pestilential diseases do not occur either, but certain of them are attacked by illnesses special to themselves—for example, the sheatfish which, mostly around the time of the Dog Star, due to swimming near the surface, gets sunstroke, and also becomes stupefied by violent thunder. This also sometimes happens to the carp, but to a lesser degree. The sheatfishes, when struck by *drakôn*[536] in the willows, are also destroyed in large numbers. In the *baleros* and the *tilôn* an intestinal worm appears at the time of the Dog Star that causes them to rise to the surface and makes them weak; and when they have come to the surface, they are destroyed by the burning heat. The *chalkis* is attacked by a violent disease: lice occurring in large numbers under the gills destroy it. Among the other fishes, no disease of this sort occurs.

534. The morning rising in mid-July.
535. *GA* $753^{a}21–27$.
536. Identity uncertain. At $598^{a}11$ a *drakôn* is a weever fish; at $609^{a}4$ and $612^{a}30$ it is a land snake of some sort.

Fishes are killed by mullein;[537] which is why people hunt them by poisoning them with mullein in the rivers and lakes; the Phoenicians even poison those in the sea.
603ᵃ1 Some people also engage in two other sorts of fish hunts. For because they flee in winter from the deep water in rivers (for even otherwise the fresh water is cold),
5 people dig a trench to the river through the dry land; then they cover it with grass and stones, making a sort of lair[538] that has an exit from the river; when there is a frost, they catch the fishes from it with a wicker trap. Another sort of hunt is engaged in in summer and winter alike: making a dam in the middle of a river with sticks and stones, they leave out only so much as is needed for an opening; inserting a wicker
10 trap in this, they catch the fish by removing the surrounding stones.

Rainy years are advantageous for the other hard-shelled animals, but not for the purpuras. A sign of this is that if they are placed where a river discharges, when they have tasted the [fresh] water, they die the same day. The purpura, when it has been
15 caught, lives for around fifty days. They are nourished by each other; for a sort of seaweed and oyster-green develops on their shells afterward. The nourishment people throw to them, is "for the weighing scales," they say, to draw them down more. Droughts, though, are not advantageous for the other hard-shelled animals; for they
20 become smaller and worse, and the red scallops become more so then. In the straits of Pyrrha, at one time, the scallops disappeared, not only because of the instrument with which the fishermen hunted them and scraped them up, but also because of the droughts. And for the other hard-shelled animals too, rainy years are advantageous,
25 because the sea becomes sweeter. In the Black Sea, because of the cold, hard-shelled animals do not occur, nor in the rivers, except for a few of the bivalves; the univalves mostly solidify when it freezes.

30 As regards the aquatic animals, then, this is the mode [of climatic influence].

8.21
Diseases of Pigs

Among the four-footed animals, the pigs suffer from three diseases, one of which is called *bragchos*, in which mostly the parts around the jaws and windpipe become
603ᵇ1 inflamed.[539] But it can also occur in any random part of the body; for often the foot is attacked, and sometimes it is in the ear. The contiguous part also becomes putrescent immediately, until the putrescence reaches the lung; then the animal dies. The disease grows quickly, and the animal eats nothing, when the condition has started, even
5 ever so slightly. The pig-keepers treat it—when they perceive it while it is small in extent—in no other way than this: they cut out the whole of it.

537. Mullein (*plomos* or *phlomos*) is *verbascum sinuatum*.
538. Reading φωλεὸν.
539. Some of the symptoms are consistent with anthrax, others with foot-and-mouth disease.

There are two other diseases, both called *kraura*, one of which is a pain and heaviness in the head, and is the one that most are attacked by; the other is diarrhea. It seems to be incurable, while the former is relieved by applying wine to the nostrils and washing the nostrils with wine. But this one is also difficult to escape from; for it kills in two or three days. They mostly get *bragchos* when the summer brings figs and the pigs are fattest; it is relieved by giving the animal mulberries, by a bath in plenty of hot water, and if one bleeds it under the tongue.

Pigs with watery flesh get hailstone-like lumps[540] around the legs, neck, and shoulders; in these parts the hailstones occur in the greatest numbers. If the pig has few of them, the flesh is sweeter, but if it has many, it becomes very watery and insipid. Those suffering from hailstones are clear to perception; for not only do they have many of them under the tongue, but also if one plucks hairs from their bristly mane, they appear to be suffused with blood; further, those afflicted with hailstones are unable to keep their back feet quiet. They do not have hailstones while they are still only sucklings. [The pig-keepers] get rid of the hailstones by feedings with einkorn, which is also useful for nourishment.

The best thing for fattening and nourishing pigs is chickpeas and figs, but, in general, one must produce nourishment that is not simple but varied; for they enjoy changes in nourishment, just like the other animals. At the same time, they say, while one sort of nourishment produces wind, another flesh, and another fat, acorns alone, though eaten with pleasure, make the flesh watery; and, if they eat too many when pregnant, they miscarry, just as the sheep also do; for in the latter it is more noticeable that this happens because of the acorns. **604^{a}1**

The pig, though, is the only animal we know that suffers from hailstones.

8.22
Diseases of Dogs

Dogs suffer from three diseases, which are named "rabies," "dog-quinsy," and "foot-disease." Among these, rabies produces madness in a dog, and when it bites, all animals that have been bitten go mad, except the human being. This disease also kills the dogs.[541] Dog-quinsy also kills the dogs; and only a few escape from foot-disease. Rabies also attacks the camels. But elephants, they say, though they are untouched by other illnesses, are troubled by bouts of wind.

540. Actually tapeworm larvae.

541. Secluding καὶ ἄν τι δηχθῇ ὑπὸ λυττώσης πλὴν ἀνθρώπου ("and any animal bitten by a rabid dog, except the human being").

8.23
Diseases of Cows

The cows in herds get sick with two diseases, one called "foot-disease" and the other *kraura*. In foot-disease the feet swell, but the cows do not die or shed their hooves; they stand it better if the horny parts are smeared with hot pitch. When they have *kraura*, their breath becomes hot and thick; and what in the human beings is fever, in cows is *kraura*. A sign of the illness is that they droop their ears and are not able to eat. They die quickly, and when they are cut open the lung is seen to be putrescent.

8.24
Diseases of Horses

Among the horses, those at pasture are untouched by any illness other than foot-disease, but they suffer from this and sometimes shed their hooves; but when they shed them, they grow them again immediately; for the growing of the one hoof underneath occurs at the same time as the shedding of the other. A sign of the illness is that the right testicle twitches, or in the middle, a little below the nostrils, a sort of hollow develops that is wrinkled-looking.

Stabled horses suffer from many illnesses; for they are also attacked by *eileos*. A sign of the illness is that they draw up the back legs to the front legs and bring them close together, so that they almost come into collision. If it goes without food on the previous days and then goes mad, one relieves the pain by bleeding and by castration. Tetanus also attacks them; a sign of it is that the blood vessels, head, and neck are all tense, and the animal advances stiff-legged. Horses also develop abscesses. Another painful illness that attacks them is called *kritiasis*.[542] A sign of this illness is the palate becoming soft and the breath hot. These are incurable, unless they subside spontaneously.

There is also a disease called *nymphia*, in which the horse becomes possessed and looks down when someone plays the flute; when one mounts it, it bolts until one manages to get control of it;[543] but it always looks down, even when it goes mad. Also, a sign of this is that it lays its ears back toward its mane and then raises them again, stops, and breathes [with difficulty].

The following are also incurable: pain in the heart (a sign is a loose bowel and pain), displacement of the bladder (a sign of this is not being able to urinate, and the horse draws up its hooves and haunches), and if it closes its jaws on a *staphulinos*; this is the size of a *sphondulê*.[544]

542. Caused by eating too much barley.
543. The text of the final clause is uncertain.
544. Both seem to be sorts of beetles (542a10).

The bites of a shrew are dangerous, as they also are to other beasts of burden; for pustules are produced. The bite is more dangerous if the shrew is pregnant when it bites; for then the pustules burst, while otherwise they do not. When what some call a *chalkis* and others a *zignis* bites, it kills or produces intense pain; it is like the small lizards, but its color is like that of the blind snakes.[545] In general, those with experience say that pretty much all the illnesses that afflict the human being also afflict the horse and the sheep. By the drug, red sulfide of arsenic,[546] [illness] is dissipated both in the horse and in every beast of burden; it is given in water that is filtered.

A pregnant mare miscarries at the odor of a lamp being extinguished; this also happens to some pregnant women.

As regards the diseases of horses, then, this is their mode. **605^{a}1**

The so-called hippomanes grows on foals, as was said,[547] and the mares, as they are licking around and cleaning, nibble it off. But the additional stories about it are more likely fabricated by women and by those dealing in charms. But mares, by common consent, in fact eject the so-called *pôlion*[548] before the foal.

Horses recognize the voiced sounds of any horse they happened to have fought against just by hearing it. Horses like meadows and marshes; for they drink turbid water, and if it is clean, they stir it up with their hooves, then, after drinking, they bathe in it. For in fact the animal is, in general, bath-loving and water-loving; that is also why the nature of the hippopotamus[549] is composed as it is. But the cow is the contrary of the horse; for unless the water is clean, cold, and unmixed with anything, it is not willing to drink it.

8.25
Diseases of Asses

The asses suffer mostly from one disease, which is called *mêlis*. It occurs around the head first, and phlegm that is thick and red runs down the nostrils; if it goes down into the lung, it kills; but what occurs around the head is not fatal. This sort of animal is most sensitive to the cold; that is why asses do not occur around the Black Sea and Scythia.

545. $567^{b}25$–26.
546. Cf. $626^{a}7$.
547. $572^{a}21$, $577^{a}9$.
548. The membrane around the foal in the uterus.
549. Literally, "the horse of the river."

8.26
Diseases of Elephants

The elephants suffer from the flatulent diseases; that is why they are unable to emit either the liquid residue or that from the bowel. And if it eats earth, it becomes weakly, unless it does so continually; but if it does so continually, it is not harmed. It also gulps down stones sometimes. It is also attacked by diarrhea; when it is attacked, they treat it by giving it hot water to drink, and they dip the fodder in honey when giving it to the elephant to eat, and each of these puts a stop to it. When they are tired because of not having lain down to sleep, they are cured when their shoulders are rubbed with salt, olive oil, and hot water. When their shoulders are painful, they apply roasted pork, and this helps them. Some elephants drink olive oil, others do not; and if there happens to be some iron in an elephant's body, olive oil, when they drink it, expels the iron, so they say; to those who do not drink it they give a root they have boiled in the olive oil.

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As regards the four-footed animals, then, this is the mode [of their diseases].

8.27
Diseases of Insects

Most of the insects thrive in the precise season in which they come to be, when the year is like the spring, wet and warm.

In the case of the bees, small beasts come to be in the hives that damage the combs. One is a little larva that spins a cobweb and damages the combs (it is called a *klêros*,[550] though some call it a *puraustês*; within the comb it gives birth to a sort of little spider that is like itself, and produces disease in the hive); another beast is like the moth that flies around a lamp; this one gives birth to something that is covered in fine down, and is not stung by the bees but flees only when fumigated. Caterpillars also appear in hives,[551] which the bees do not defend themselves against.

Bees most become diseased when the tree has blossoms that suffer from mildew, and in drought years.

All insects die if smeared with olive oil, and do so most quickly, if one anoints their head and exposes it to the sun.

550. $626^{b}17–19$.

551. Omitting ἃς καλοῦσι τερηδόνας ("which they call a *terêdôn*").

8.28
The Effects of Place on Animal Kinds

The animals also differ in accord with their places; for just as in certain places certain animals do not occur at all, so in certain places they occur, but are smaller or shorter-lived, and do not thrive. And sometimes the difference in such things is found in nearby places—for example, in neighboring places in Miletus, the cicadas[552] occur in one but not in the other, while in Cephalonia a river separates a part where the cicadas occur from a part where they do not occur. In Pordoselene a road separates the side on which the weasel occurs from the side on which it does not occur. In Boeotia the moles occur in large numbers around Orchomenus but in the neighboring Lebadia they are not, and if one takes them there, they are not willing even to dig. In Ithaca, hares—if **606^{a}1** one takes them there and releases them—cannot live, but are seen dead by the sea, turned in precisely the direction from which they came. In Sicily the horseman-ants[553] do not occur, and in Cyrene, the croaking frogs previously were not. In all Libya, there is neither wild pig, nor deer, nor wild goat. In India, as Ctesias (who is not really trustworthy) says, there is neither tame nor wild pig, but the blooded animals and the hard-scaled ones are all large. In the Black Sea neither the soft-bodied nor the hard-shelled animals occur, except for a few in certain places; but in the Red Sea all the hard-shelled animals are exceedingly large.

In Syria the sheep have tails that are a cubit in breadth; the goats have ears that are a span and a palm long, and in some the ears meet down below, near the ground; and the cows, like the camels, have humps on their shoulders. In Lycia the goats are shorn like the sheep in other places. In Libya the horned animals have horns right at birth, and not the males only, as Homer says,[554] but the others too. In the Black Sea region near Scythia, it is the contrary: they are born hornless.

In Egypt, though the other animals—for example, the cows and the sheep—are larger than in Greece, some are smaller—for example, the dogs, the wolves, the hares, the foxes, the ravens, and the hawks; and some are much the same size—for example, the crows and the goats. The cause is attributable to the nourishment, because it is plentiful for some, scarce for others—for example, for the wolves and the hawks (for there is little for the carnivores, for the little birds are scarce), and for the hares and all the non-carnivores, because neither nuts nor fruits last long. **606^{b}1**

In many places, though, the climatic blend is also a cause—for example, in Illyria, Thrace, and Epirus, the asses are small, while in Scythia, and in Celtic territory, they do not occur at all; for these animals cannot stand the cold.[555]

552. 556^{a}21–25.
553. Perhaps a sort of large flying ant.
554. *Odyssey* 4.85.
555. 605^{a}20–21.

In Arabia lizards occur that are over a cubit long, and mice that are much larger than field mice, with front legs that are a span long and back legs that are up to the first joint of the fingers in length.

In Libya, the size of the snakes is immense, so it is said; for some sailors say that they saw there the bones of many cows, which—as it became clear to them—had been eaten by snakes; for as they were putting out to sea, these quickly pursued their triremes, and plunged some of them into the water, when they overturned their trireme.

Further, the lions occur more in Europe[556] (that is, in the place in Europe that lies between the rivers Achelous and Nessus); the leopards, on the other hand, occur in Asia but not in Europe.

In general, the wild beasts are wilder in Asia, but all those in Europe are more courageous, though those in Libya are the most multiform; in fact it said in a proverb that "Libya always bears something new."[557] For because of the lack of rain, it seems that animals have sexual intercourse when they meet at the watering-places, even though they are not of the same kind, and they bring offspring to birth, if their pregnancies are the same, and if their sizes are not far from each other's; they become milder toward each other because of their need for drinking water. And, in fact, contrary to the animals of other places, they also need to drink more in winter than in summer; for because sources of water do not usually occur in summer, they are unaccustomed to drinking then. As for the mice [there],[558] when they drink, they die.

Other animals also come to be from the sexual intercourse of animals that are not of the same kind, as in Cyrene the wolves have sexual intercourse with the dogs and generate offspring; and from the fox and the dog, the Laconian hounds[559] are born. They also say that from the tiger and the dog, the Indian hounds are born[560]—not immediately, but from their third intercourse; for the first one born is savage, they say. They take the female dogs to deserted places and tie them up; and many are eaten, if the wild beast does not happen to be ready for mating.

8.29
The Effects of Place on the Lives of the Animals

Places also produce differences in the characters of animals—for example, mountainous and harsh places produce characters different from those in level and soft places; for even their appearances are more savage and more aggressive, like the pigs on Mount Athos; for the males do not even stand the females of the lower regions.

556. Reading Εὐρώπῃ.
557. *GA* 746ᵇ7–8.
558. Cf. 595ᵃ7–8.
559. Cf. 574ᵃ16–17, 608ᵃ27–28.
560. *GA* 746ᵃ34–35.

Also, with regard to the bites of the wild beasts, the difference between the regions is great—for example, around Pharos and other places the scorpions are not dangerous, but in other places, especially in Scythia, they are numerous, large, become dangerous, and kill any human being or other beast they strike, even pigs (which are least sensitive to the bites of other animals); and among these, they especially kill the black ones; the pigs that have been struck die more quickly if they go into water.

The bites of the snakes also differ a lot. For the asp occurs in Libya, which is the snake from which they make the putrefacient, and besides is incurable. A certain little snake also occurs in silphium,[561] for which the remedy is said to be a sort of stone they get from the tomb of one of the ancient kings, dip into wine, and drink.

In certain places in Italy the bites of the geckos are also deadly. But the bites of all the venomous animals are more dangerous if one happens to have eaten another—for example, a viper that has eaten a scorpion. But to most of them[562] human spittle is inimical. There is a small snake, which some call "sacred," that the very large snakes avoid; it becomes at most a cubit in length, and looks hairy; what it bites, immediately putrefies around the bite. There is also a small snake in India that is the only one for which they do not have a remedy.

8.30
The Effects of Pregnancy

The animals differ as to good condition or the contrary also in connection with pregnancy. For the hard-shelled animals—for example, the scallops, all the oyster-like animals, and the soft-shelled animals, for example, the crayfishes—are best when pregnant. Pregnancy is said of the hard-shelled animals too; even though, while the soft-shelled animals are seen mating and giving birth, none of these ever is. The soft-bodied animals are also best when pregnant—for example, the calamaries, the cuttlefishes, and the octopuses. **$607^{b}1$**

The fishes are pretty much all good when starting to be pregnant, but as pregnancy advances, some are and some are not. The *mainis*[563] is good when pregnant; the female's shape is rounder, that of the male longer and broader; the start of the female's pregnancy coincides with the male's having a dark and variegated color, and its being worst to eat. They are called "goats" by some people around this time.

The ones they call *kottuphos*, the wrasses, and the carid[564] also change color with the seasons, just like some of the birds; for in spring they become dark, then after spring they become light again. *The phukis* also changes color; for the rest of the time it is white, but in spring variegated; it is the only one of the sea fishes that builds

561. A plant whose juice was used in food and medicine.
562. Probably the venomous animals, but possibly their bites.
563. $570^{b}26$.
564. Reading καρὶς.

nests, as they say, and lays eggs in the nest. The *mainis* also changes [color], as was said,[565] and the picarel, and from a lighter color they change back again in summer and become dark; the change is most noticeable around the fins and gills.

The sea crow is also best when pregnant, like the *mainis*. But the mullet, the bass, and the soft-scaled fishes[566] are pretty much all of poor quality when pregnant. A few are the same whether pregnant or not—for example, the *glaukos*. Old fishes too are of poor quality; in fact, the tunas, when old, are of poor quality even for pickling; for much of their flesh wastes away. The same also happens in the case of the other fishes. The old ones are clear to perception from the size and hardness of the scales. An old tuna was once caught that weighed fifteen talents, and the dimension of its tail was five[567] cubits and a span.

The river and lake fishes become best when, after the discharge of the embryo and the seminal fluid, they have become fattened. Some are good when pregnant—for example, the *saperdis*; others are of poor quality—for example, the sheatfish. Though in the case of all the other fishes the males are better than the females, the female sheatfish is better than the male. In the eels too, those they call "females," are better; they call them "female," though they are not, but [only] differ in appearance.[568]

BOOK 9

9.1
Animal Psychology; War among the Animals

The characters of the animals that are more indistinct and shorter-lived are less clear to our perception, while those of the longer-lived ones are more clear. For they are seen to have a certain natural capacity corresponding to each of the affections of the soul: practical wisdom and foolishness, courage and cowardice, mild-manneredness and harshness, and the other states of this sort. Some animals share at the same time in some learning and teaching, some from each other, some from human beings, namely, all the ones that partake of hearing, not only the ones that hear sounds, but those that also perceive distinctly the differences between signs.

In all the kinds in which there are the male and the female, nature has distinguished the character of the females from that of the males in pretty much the same way. But the distinction is most evident in the case of the human beings, the animals having magnitude, and the live-bearing four-footed animals. For the character of the females is softer, quicker to be tamed, lets [human] hands approach, and is better

565. 607b12–13.
566. Reading λεπιδωτοὶ.
567. Reading πέντε.
568. Cf. 538a2–13.

at learning—for example, the female Laconian hounds are in fact naturally cleverer than the males. The kind of hounds in Molossia is no different for purposes of hunting from those in other places, but for following along with sheep it is superior in virtue of its size and its courage in facing wild beasts. And the ones that come from both kinds—from the ones in Molossia and the ones in Laconia—are superior in courage and love of labor.

All females are less spirited than the males, except the bear and the leopard; the female of these seems to be more courageous. But, in the other kinds, the females are softer, more malicious, less simple, more impetuous, and more thoughtful about the nourishment of the offspring, while the males, on the contrary, are more spirited, more savage, simpler, and less treacherous. **$608^{b}1$**

There are traces of these characters in (one might almost say) all animals, but they are more evident in those that have more of a character, and especially so in the human being; for this one has the most complete nature,[569] so that these states too are more evident in these. That is why a woman takes pity more than a man does, is more given to tears, and further, more envious, more nursing of grievances, more fond of abusing people, and more inclined to come to blows. The female is also more spiritless and despondent than the male, more shameless, more of a liar, readier to deceive, and has a longer memory; further, she is less sleepy, more timid, and, in general, less inclined to move than the males, and needs less nourishment.

On the other hand, the male, as was said,[570] is more ready to help and more courageous than the female, since even among the soft-bodied animals, when the cuttlefish has been struck by a trident, the male helps the female, while the female flees when the male is struck.

There is a war against each other among all the animals that occupy the same places and live on the same things; for if nourishment is scarce, even those of the same kind fight against each other; thus even the seals, they say, that live around the same place make war, male against male, female against female, until one kills or drives out the other; and the pups all do the same thing.

Further, all are at war with the carnivores, and these with the others; for they get their nourishment from animals. (It is also from this that the prophets get their dissociations and associations, positing as dissociates those that are at war with each other and as associates those that are at peace with each other.) But if there was no shortage of nourishment, it is probable that those that are now afraid of human beings and are savage would behave tamely, both toward human beings, and in the same way toward each other. This is made clear by the way animals are taken care of in Egypt; for because nourishment is taken for granted and is not in doubt, even the most savage animals live with each other; for they become tame because of these

569. *GA* $733^{a}32–^{b}16$.
570. Implied at $608^{b}3–4$.

benefits— for example, in some places the crocodile kind has become tame toward
609ᵃ1 the priest because their nourishment is taken care of. The same thing is seen to occur around the other countries too, and in their individual parts.

The eagle and the *drakôn*[571] are at war; for the eagle nourishes itself on snakes. Also, the tracker[572] and the venom-spider; for the tracker hunts the venom-spiders. Among the birds, the *poikilis*, the larks, the woodpecker, and the *chlôreus*; for they eat each other's eggs. And the crow and the owl; for at midday, because the owl does not see sharply during the day, the crow steals and eats its eggs, while the owl does the same during the night; and so, the one is stronger during the day, the other during the night. Also, the owl and the *orchilos* are at war; for it too eats the owl's eggs. During the day, the other little birds too fly around the owl (which is called "admiring" it), and fly at it and pluck out its feathers; that is why bird-catchers hunt all sorts of little birds by means of it. And the so-called old man[573] is at war with the weasel and the crow; for they eat her eggs and chicks.

Also, the turtledove and the *purallis*; for they feed and live in the same place. Also, the green woodpecker and the *libuos*. And the kite and the raven; for the kite steals whatever the raven has hold of, because of being stronger with his claws and in flight, so that their nourishment makes them enemies too. Further, those that live from the sea are also at war with each other—for example, the *brenthos*,[574] the gull, and the *harpê*.[575] And the buzzard, the toad, and the snake; for the buzzard eats them. Also, the turtledove and the *chlôreus*; for the *chlôreus* kills the turtledove. Also, the crow kills the so-called *tupanos*. The *aigôlios* and the other crook-taloned birds eat the *kalaris*; hence the war between them. There is also war between the gecko and the spider; for the gecko eats the spiders. And between the horse[576] and the heron; for it eats the heron's eggs and chicks. And between *aigithos* and ass there is war because, when the ass is nearby, it scratches its sores on the thorns; and because of this, and if it brays, it causes the eggs to fall out and the chicks; for they fall out [of the nest] because they are frightened; and the bird, because of this injury, flies at the ass and pecks at its sores.

609ᵇ1 The wolf is at war with the ass, the bull, and the fox; for being carnivorous, it attacks the cows, the asses, and the fox. Also, the fox and the *kirkos*[577] due to the same cause; for being crook-taloned and carnivorous, the *kirkos* attacks it and produces sores by striking it. Also, the raven is at war with the bull and the ass, because it flies at them, strikes them, and pecks at their eyes. The eagle and the heron are also at war; for being crook-taloned, the eagle attacks it and the heron dies while defending itself.

571. 602ᵇ25.
572. 552ᵇ26–30.
573. 615ᵃ17–20.
574. Perhaps the same as the *brenthos* mentioned at 615ᵃ16.
575. 610ᵃ11, 617ᵃ10.
576. Reading ἵππῳ.
577. 9.36.

Also, the merlin is at war with the vulture, the *krex*[578] with the *eleos*,[579] blackbird, and oriole (which some storytellers say was produced from a funeral pyre); for the *krex* injures both them and their offspring. Also, the nuthatch and the wren[580] are at war with the eagle; for the nuthatch breaks the eagle's eggs, and the eagle—both because of this and because it is carnivorous—is at war with all. And the *anthos*[581] is as war with the horse; for the horse drives it out of the pasture (for the *anthos* feeds on grass and, since it has a film over its eyes, is not sharp-sighted); for it imitates the horse's voice and frightens him by flying at him, and so he drives it out; but when he catches it, he kills it. (The *anthos* dwells beside a river and marshes, it has a beautiful color, and it lives well.) The ass is at war with the gecko; for the latter sleeps in his manger, and prevents him from eating by creeping into his nostrils.

There are three kinds of herons,[582] the gray, the white, and the so-called starry. Of these, the gray has difficulty in being mated and in mating. For it screams and releases blood, so they say, from its eyes while mating, and lays poorly and painfully. It is at war with those that injure it, with the eagle (which seizes it), the fox (which destroys it at night), and the lark (which steal its eggs).

The snake is at war with the weasel and the pig: with the weasel[583] when they are both in the same house; for they live on the same things; and the pig eats the snakes. Also, the merlin is at war with the fox; for it strikes it, plucks at it, and kills its offspring; for it is crook-taloned. But the raven and the fox are friends with each other; for the raven is at war with the merlin; that is why it aids the fox when it is being struck. Also, the vulture and the merlin are at war with each other; for both are crook-taloned. And the vulture even fights with the eagle. The swan does too; and the swan often prevails. The swans are also the most likely of all birds to eat each other. **610^{a}1**

Among the wild beasts, some are always at war with each other; others, like human beings, on occasion.

The ass and the *akanthis*[584] are at war; for the *akanthis* live on thorn bushes, and the ass eats the thorns when they are tender. Also, the *anthos*, the *akanthis*, and the *aigithos*; and it is said that the blood of the *aigithos* and the *anthos* do not mix with each other.

The crow and the heron are friends, and the *schoiniôn*[585] and the lark, and the *laedos* and the green woodpecker; for the green woodpecker dwells beside a river and thickets, the *laedos* in rocks and mountains, and they like the place where they dwell.

578. 616^{b}19–21. Perhaps the corncrake or the black-winged silt.
579. 592^{b}10–15.
580. 615^{a}17.
581. 592^{b}25.
582. 9.18.
583. Often kept as a pet.
584. 592^{b}30.
585. Perhaps the same as the *schoinilos* (593^{b}4).

Also, the *piphigx*, *harpê*,[586] and kite are friends, and fox and snake (for both live in holes), and blackbird and turtledove.

But the lion and the *thôs*[587] are at war with each other; for being carnivorous, they live on the same things. Elephants also fight fiercely with each other, and strike each other with their tusks; the defeated one is very much enslaved and does not dare to resist the victor's voice. The elephants differ from one another in courage to a wondrous degree. The Indians in fact use females just like males as war-elephants; however, the females are smaller and much less courageous. The elephant knocks down walls by striking its large tusks against them, and palm trees with his forehead, until it has bent them over, and then, by trampling on them with its feet, stretches them out on the ground. The hunt for elephants is as follows: the hunters pursue them mounted on elephants that are tame and courageous, and when they have caught one, they order those tame ones to strike it, until they have exhausted it; then the elephant-driver leaps onto it and directs it with his metal goad. After this it quickly becomes tame and obeys. While the elephant-driver is mounted, all are tame; but when he has dismounted, some are, others are not; but they bind the front legs of those that go wild, in order to calm them down. The hunt is both for those already large and for calves.

The friendships and the wars between these wild beasts, then, happen because of their nourishment and their mode of life.

9.2
War and Friendship among the Sea Fishes

610b1 Among the fishes some herd together with each other and are friends, while those that do not herd together are at war. Some herd together when pregnant, some when they are giving birth. In general, the fishes that herd together are the following: the tunas, the *mainis*, the gobies, the *boax*, the horse mackerels, the sea crows, the dentex, the red mullets, the *sphuraina*, the *anthias*, the *eleginos*, the *atherinos*, the *sarginos*, the garfishes, the calamaries, the rainbow wrasse, the young tunas,[588] the mackerel, and the colymackerels. Among these, some not only herd together but form couples too; the rest, though they all form couples, only form herds on some occasions, as was said,[589] some when pregnant, some also when they have given birth.

The bass and the mullet, although being the worst of enemies, herd together on certain occasions; for often not only those of the same kind herd together, but also those whose fodder is the same or much the same, if it is abundant.

586. 609a24, 617a10.
587. 507b17.
588. 571a11.
589. 601b2–3.

The mullets and the conger eels often live with their tail removed as far as the outlet for the residue; that of the mullet is eaten by the bass, that of the conger eel by the muraena.

There is war between the stronger and the weaker [fishes]; for the stronger eat them.

So much, then, for the sea fishes.

9.3
The Goats and the Sheep

The characters of the animals, as was said previously,[590] differ with respect to cowardice, mild-manneredness, courage, tameness, understanding, and foolishness. For the character of sheep, so it is said, is simple and foolish; for of all the four-footed animals it is the worst: it wanders into deserted places with nothing in view, and often in wintry weather goes out from inside, and when sheep are caught in a snowstorm, they are unwilling to leave unless moved by the shepherd; instead, they perish while remaining, unless the shepherds bring males; then they follow along.

As for the goats, when one pulls the tip of one female goat's beard (which is like hair), all the other female goats stand as if stupefied looking at her.

Sheep are colder than goats to sleep among; for the goats chew the cud more and come toward human beings; and goats are more sensitive to the cold than sheep.

Shepherds teach the sheep to run together when there is a noise; for if one is caught in a thunderstorm and does not run with the others, it miscarries if it happens to be pregnant; that is why if there is a noise, they run together into the house out of habit. The sheep and the goats lie gathered together in family groups. When the sun turns more quickly,[591] the shepherds say that the goats do not lie face to face, but back to back.

9.4
The Cows and the Horses

The cows too graze with their companions in herds, and if one wanders away, the others follow; that is why the cowherds, if they do not find a certain one, immediately search for all of them. {Even the bulls are destroyed by wild beasts, when they have left the herd and wandered away.}[592]

Among the horses that graze together, when a mare has died, the others rear her foals between them. And, in general, the horse kind seems to be by nature affectionate

590. $608^{a}13$–21.

591. The meaning is unclear but seems to refer to the earlier setting of the sun in winter.

592. Transposed from $611^{a}2$–3.

to the young. A sign of this is that often the barren mares take the mothers' foals and are the ones that show them affection, but because they have no milk, cause their death.

9.5
The Deer

Among the wild four-footed animals, the deer does not seem to be the least practically wise, because she gives birth beside roads (for the wild beasts do not approach because of the human beings) and, after giving birth, she first eats the chorion. Also, they run for the seseli[593] and eat it before returning to the offspring. Further, she leads the offspring to her lair, accustoming them to the place where they should take refuge; this is a precipitous rock, with one point of entry, which it where, they say, the deer then stands to defend herself.

Further, the male, when it has become fat (and it does become very fat in the fruit season[594]) does not make itself evident anywhere but goes off somewhere, because its fatness makes it easy to be caught. They also shed their horns in rugged places that are difficult to find; hence the proverb "where the deer shed their horns"; for having thrown away their weapons, they guard themselves from being seen. It is said that no one has yet seen the left horn; for the deer is said to hide it because it has some sort of medicinal property.

The deer do not grow horns in their first year except for a sort of starting-point as a sign of them; this it short and hairy. In their second year, they grow horns for the first time, straight like tent pegs; that is why people call these "peg-horns." In the third year, they grow them divided in two, and in the fourth year, rougher;[595] and in this way always increasing up to six years. After that, they always grow them the same
611[b]1 ones, so that one can no longer know their age by the horns, although people know the old ones mostly by two signs; for some have no teeth, others few, and they no longer grow the "defenders." The ones called "defenders" are the forward-pointing tips of the growing horns, with which they defend themselves; the old ones do not have these, instead the growth of their horns is straight upward. They shed their horns every year; they shed them around the month of Thargelion.[596] When they have shed them, they hide themselves during the day, as was said;[597] they hide in thickets to avoid the flies. During this time, they feed at night, until their horns have grown out. They grow in a sort of skin at first, and become hairy; but when they have grown, the

593. A medicinal herb (perhaps *Tordylium officinale*) used to treat prenatal and postnatal disorders.
594. 579[a]6.
595. Probably τρικρανῆ ("three-tipped") or the like should be read in place of τραχύτερον.
596. May.
597. 611[a]25–27.

deer sun themselves, in order to concoct and dry out the horn. When it is no longer painful to rub the horns on trees, they leave these places because they feel confident, since they have a means of defending themselves. And cases have been observed of an *achainês*[598] deer that was caught with a lot of green ivy growing on its horns, implying that the horns were tender when the ivy was implanted, as if in green wood.

When the deer have been bitten by a venom-spider, or something of this sort, they collect marjoram and eat it; this is believed also to be good for a human being to take in a drink, though it is distasteful.

The female deer, when they have given birth, immediately eat the chorion, and it is not possible to get hold of it; for they grasp it before it has fallen to the ground; it is believed to be a remedy.

The deer, when hunted, are caught by pipe playing and singing, and making them lie down due to the pleasure. There are two hunters: one sings or pipes in the open; the other shoots from behind, when the former indicates the opportune moment. If the deer happens to have its ears upright, it hears sharply and it is not possible to catch it unawares; but if it happens to have them laid back, it is possible.

9.6
Practical Wisdom in Animals

When the bears flee, they push their cubs forward and pick them up and carry them; and when they are being overtaken, they jump up into trees. And when they have come from their lair [after going into hiding], they first eat arum, as was said previously,[599] and chew sticks as if cutting teeth.

612^{a}1 Many of the other four-footed animals also do things to aid themselves in a practically wise way; thus in Crete, they say, that when wild goats are struck by arrows they look for dittany; this is believed to be effective in expelling arrows in the body. Also, when something pains dogs, they make themselves vomit by eating a certain herb.[600] And when the panther has eaten the poison, panther-bane,[601] it looks for human excrement; for this aids it. (This poison also kills lions.) That is why in fact the huntsmen hang the excrement in a container from some tree, in order that the beast not wander far away; for jumping up hoping to get hold of it, the panther dies. They also say that the panther, observing that the other animals like her odor, hunts them by concealing itself; for they come near; and in this way it catches even the deer.

The Egyptian ichneumon, when it sees the snake called the "asp," does not attack it until it has called on other ones to help. They plaster themselves with mud against

598. $506^{a}24$.
599. $600^{b}10$–12.
600. $594^{a}28$–29.
601. Probably aconite.

its blows and bites; for having first drenching themselves in water, they roll around in the earth.

When the crocodiles yawn, the crocodile birds fly in and clean their teeth, and so these get their nourishment, while the crocodile, perceiving that it is being benefited, does not harm them; and when it wishes them to leave, it moves its neck, in order not to crush them with its teeth.

When the turtle has eaten a viper, it eats marjoram after it; this has actually been seen. And once, when someone had seen a turtle doing this several times, and when it had plucked up some marjoram, going back again to the viper, he stripped the leaves off the marjoram; as a result of this, the turtle died. When the weasel fights a snake, it also eats rue; for its odor is inimical to snakes.

When the *drakôn*[602] eats fruit, it sucks the juice of *pikris*,[603] and has been seen doing this. When the dogs have worms, they eat the standing wheat. The storks and the other birds, when they have a wound from fighting, apply marjoram to it.

Many have seen even the cricket, when fighting with snakes, seize the snakes' neck.
612[b]1 The weasel too seems to overpower birds in a practically wise way; for it tears them by the throat as wolves do sheep. It also fights especially with mouse-eating snakes, because it too hunts the same animal.

As regards perception in hedgehogs, it has been observed in many places that, when north and south winds change places, the ones that live in the ground move their holes, while those that live in people's houses change [their places in relation to the] walls, so that a person in Byzantium, they say, gained a certain reputation for making a prediction based on observing the hedgehog doing these things.

The marten is around the size of the small dogs of Melite, and in its hairiness, its appearance, its white stomach, and the mischievousness of its character, it is like the weasel. Also, it becomes very tame, but does mischief to beehives; for it enjoys the honey. It is a bird-eater like the cats. Its sex organ, as was said,[604] is bony; that of the male is believed to be a remedy for strangury; they administer it by grating it up.

9.7
Practical Wisdom in Birds

In general, one may observe in the lives of the other animals many imitations of the life of human beings; and more so in the smaller ones than in the larger ones, one may see an exactness of thought—for example, in the first place, in the case of the birds, the nest-building of the swallows;[605] for in the mixing of straw with mud, it

602. 602[b]25.
603. Perhaps prickly goldenfleece (*Urospermum picroeides*) or prickly oxtongue (*Helminthia sepioides*).
604. 500[b]23–25.
605. *Ph*. 199[a]26.

keeps the same order.[606] It weaves together mud with the bits of straw; and if it is at a loss for mud, it drenches itself and rolls its feather in the dust. Further, it builds the nest in just the way the human beings do, in first putting the hard materials underneath and making the size of the nest commensurable with its own. As regards the nourishment of the offspring, both parents labor at it; they give some to each observing by a sort of intimate familiarity the one that has had it, so that it does not get it twice. Also, at first they themselves throw out the excrement [of the offspring], but when these have grown, they teach the chicks to turn around and emit it outside.

As regards the pigeons, there are other things supporting an observation of the same sort; for they are neither willing to form a couple with more than one partner, nor do they quit the partnership before becoming a widower or a widow. Further, as regards the pains of giving birth, the care of the male for the female and his sharing in her distress are extraordinary; and if she shows cowardice at entering the nest because of the birth, he strikes her and compels her to go in. When the chicks have **613^{a}1** appeared, he gives thought to suitable nourishment and, having masticated it,[607] spits it into the open mouth of the chicks, preparing it beforehand for their nourishment. When he is about to eject all of them from the nest, the male mates [with the female].

For the most part, this is the way pigeons are mutually affectionate, but sometimes even the females that have male partners are mated by others. The pigeon is a pugnacious animal, and the pigeons give each other trouble, and steal into each other's nests, although rarely; for they are less pugnacious when further away, but beside the nest, they fight to the end.

It seems to be a special affection of common pigeons, wood pigeons, and turtledoves not to lift their head when drinking if they have not drunk enough.

The turtledove and the wood pigeon each keeps the same male and does not submit to another; both the male and the female brood on the eggs. It is not easy to distinguish the female and the male except by their internal parts. The wood pigeons live a long time; for in fact twenty-five- and thirty-year-old ones have been seen, and even some forty-year-old ones.[608] When they are older, their claws grow; but those who rear pigeons cut them. No other infirmities are noticeable in old age.

Also, the turtledoves and the common pigeons that have been blinded by those who rear them as decoys live as long as eight years. As for the partridges, they live for around fifteen years. The wood pigeons and the turtledoves always nest in the same places. In general, males are longer-lived than females, but in the case of these birds, some say that the males die before the females, basing their proof on the decoys nurtured in the house. They also say that the male sparrows live for only a year, producing as a sign the fact that in spring they are not seen with the black around the beard from the outset, but acquire it later, suggesting that none of the previous

606. I.e., as human beings do when they make bricks this way.
607. Reading φροντίζει τῆς ἁρμοττούσης τροφῆς ἧς διαμασησάμενος.
608. 563^{a}1–2.

birds has survived. And they say that the female sparrows are longer-lived; for they are caught in with the younger birds and are distinguishable by the parts around the
613ᵇ1 beak being hard.

The turtledoves spend summer in the wintry places,[609] while the chaffinches spend
5 summer in the warm places and winter in the cold ones.

9.8
The Quails and the Partridges

The heavy birds do not build nests for themselves[610] (for it is not advantageous for them, since they are not flyers)—for example, the quails, the partridges, and the other birds of this sort; but when they have made a rolling place on level ground (for they do not lay eggs in any other place), and screened it with thorns and sticks as a defense
10 against the hawks and the eagles, they lay them and brood on them there. Then, as soon as they are hatched, they lead out the chicks, because they are unable to provide nourishment for them by flying. Both the quails and the partridges, like the chickens,
15 bring the chicks under them when they are resting. And they do not lay and brood in the same place, in order that no one discover the place by their sitting there too long. When someone chances upon a nest of young birds, and tries to catch them, the partridge rolls at the feet of the hunter, so as to seem easy to catch, and attracts him toward herself, so that it seems to him that he is about to catch her, until all the
20 chicks have scattered; after that she flies up and calls them back again.

The partridge lays not less than ten eggs, often sixteen. And, as was said,[611] the bird has a bad character and is cunning. In spring, by means of singing and fighting, they are separated out of the herd in couples with the females, each male with the female
25 he has got. And because they are lecherous, to prevent the female from brooding,[612] the males roll the eggs around and shatter them if they find them. But the female, contriving to counter this, lays after running away, and often, because of her readiness to lay, deposits them at random; if the male is near, so as to save the clutch of
30 eggs, she does not go near them. And if she is seen by a person, then just as she does with the chicks, she leads him away from the eggs, by appearing before the person's feet, until she has led him away.

When the female, having run away, broods on the eggs, the males join together in
614ª1 screaming and fighting; they call these "widowers." The one who has been defeated in the battle follows the victor and is mounted only by him. And if he is overpowered by a second male or any other, he is mounted by one that overpowers him in secret.[613]

609. Cf. 593ª17–18, 597ᵇ4, 600ª20–22.
610. 558ᵇ31.
611. Reference unclear.
612. Cf. 564ª20–23.
613. Presumably from the first victor.

This does not occur at all times, but in a particular season of the year; and it is the same way with the quails. Sometimes this happens with the cocks too; for in the temples, where they are presented as offerings without the females, they all with good reason mount the new arrival. Also, among the partridges, the tame males mount, peck, and are wantonly aggressive toward the wild males.

The leader of the wild partridges presses forward against the hunting partridge[614] and sings in answer to him, as when fighting. When this one has been caught in the nets, another comes forward in turn, and sings in answer in the same way. If the hunting one is a male, that is what they do; if it is a female that is hunting and singing, and the leader sings in answer to her, the others gather around and strike him, and chase him away from the female, because he is approaching her and not them. Because of this he often approaches her in silence, in order that no other male, hearing his voice, starts fighting with him. Sometimes, those with experience say, when approaching the female, the male keeps her quiet, in order that the males not hear and he not be compelled to fight against them.

The partridge not only sings, but also emits a scream and other voiced sounds. Often too, when brooding, the female stands up, when she has perceived the male turning toward the hunting female, and sings in answer and stays where she is, in order to be mounted by him and to tear him away from the hunting female. The partridges and the quails are so intensely excited about mating that they throw themselves on the hunters[615] and often settle on their heads.

As regards the mating and hunting of the partridges, then, and as regards their cunning character, these are the sorts of things that happen.

The quails and partridges nest on the ground, as was said,[616] and so do some of the other birds that are flyers. Further, among birds of this sort, the lark, the woodcock, and the quail settle not on a tree but on the ground.

9.9
The Woodpeckers

The woodpecker does not settle on the ground. It pecks at trees in order to make the larvae and *sknipes*[617] come out. For when they have come out, it collects them with its **$614^{b}1$** tongue; it has a broad and large one. Also, it moves by walking on the trees quickly in every mode, even upside down, like the geckos. It has claws that are naturally better than those of the jackdaws for security when settling in trees; for it walks by sticking them in.

614. A live bird used as a decoy.
615. Probably the hunting quails.
616. $613^{b}6$–12.
617. $593^{a}3$.

Among the woodpeckers, there is one kind that is smaller than the blackbird, which has small reddish markings; another kind is larger than a blackbird; and the third kind of these is not much smaller than a female chicken. It nests in trees, as was said,[618] and, among other trees, especially in olive trees. It feeds on the ants and larvae that come from trees. In hunting for larvae it hollows out trees with such vehemence, they say, that the trees fall down. Also, one that was being tamed once inserted an almond into a cleft in a piece of wood, in order that by being fitted there it would not escape his blow; on the third blow, he split it and ate the soft part.

9.10
The Cranes and the Pelicans

Many examples of practical wisdom also seem to occur among the cranes; for they migrate a long way and fly to the heights in order to see into the distance, and if they see clouds and bad weather, they fly down and rest quietly. Further, they have both a leader and signalers in the outermost positions that whistle, so that their voiced sound is heard. When they settle, while the others sleep with their head under their wing, on one foot and then on the other, the leader keeps watch with his head uncovered, and when he perceives something, he signals it with a cry.

The pelicans that occur on rivers gulp down the large smooth mussels; and when they have concocted them in the place before the stomach, they vomit them up, so that while the mussels are open, they can extract the flesh and eat it.

9.11
Bird Nests

The dwellings of the wild birds are devised both for their lives and for the preservation of their offspring. Some of them are kind to their offspring and take care of them, others are the contrary; some are good at devising things for life, others not good at devising. Some build their dwellings in ravines (*charadra*), others[619] in clefts and rocks—for example, the so-called *charadrios*.[620] The *charadrios* is base in both color and voice; it appears at night but shuns the day.

The hawk too nests in precipitous rocks. Although it is carnivorous, it does not eat the heart of the birds it overpowers; some have observed this both in the case of the quail and in the case of the thrush, and others in other cases. Further, they change their way of hunting; for they do not seize [their prey] in the same way in summer.

618. Perhaps thought to be implied by 614a34–35.
619. Reading οἱ δὲ.
620. 593b15.

It is said of the vulture[621] by some people that no one has seen either its chick or its nest. It is because of this, indeed, that Herodotus, the father of Bryson the sophist, said that the vulture comes from some other lofty land, citing as proof both this and the fact that many suddenly appear, and it is not clear to anyone from where. But the cause of this is that it gives birth in inaccessible rocks, and the bird is not native to many places either. It lays one egg, or at most two.

Some birds dwell on mountains or in the woods—for example, the hoopoe and the *brenthos*;[622] the latter bird lives well and is a singer. The wren[623] dwells in thickets and holes. It is difficult to catch, is a skulker, and has a weak character; but it lives well and is crafty. It is called the "old man" and the "king"; which is why, they say, the eagle is at war with it.

9.12
Aquatic Birds

Some birds spend their life near the sea—for example, the *kigklos*.[624] The *kigklos* is cunning in character and hard to catch, but when caught, it is very easily tamed. It also happens to be deformed; for it lacks control of its back parts.[625]

Also living near the sea, rivers, and lakes are all the web-footed birds; for nature itself seeks what is suitable. Many of the split-footed birds too spend their life near waters and marshes—for example, the *anthos* beside rivers; it has a beautiful color and lives well. The *katarraktês* lives near the sea, and when it dives into the depths, it stays for no less a time than it takes someone to walk a plethron; the bird is smaller than a hawk.

The swans are also among the web-footed birds, and they spend their lives near lakes and marshes; they live well, are good natured, kind to their offspring, and age well. If an eagle starts a fight, they defend themselves and prevail, but they do not start a fight themselves. They are singers, and they sing most at the time of their death; indeed, they also fly out to sea, and people sailing by Libya once came upon large numbers of them on the sea singing in a mournful voice and saw some of them dying. **$615^{b}1$**

The *kumindis* is seldom seen; for it dwells in the mountains. It is black, the size of the hawk called the "wood pigeon killer,"[626] and in appearance long and thin. The

621. $563^{a}5$–12.
622. $609^{a}23$.
623. $609^{b}12$.
624. $593^{b}6$.
625. I.e., it is a wagtail and/or (perhaps) lecherous.
626. $620^{a}18$.

Ionians call it *kumindis*; it is the one Homer mentions in the *Iliad*,[627] saying that "gods call it *chalkis*, but men *kumindis*."

The *hubris*, some people say, is the same bird as the *pôgx*.[628] It does not appear during the day because it does not see sharply, but at night it hunts like the eagles. And these birds fight against the eagle so violently that both are often caught alive by shepherds. The *hubris* lays two eggs, and it too[629] nests in rocks and caves. Cranes also fight against each other so violently that they too are caught while fighting; for they keep it up. The crane lays two eggs.

9.13
Other Birds

The jay changes its voiced sounds most often; for it emits a different one every day, one might almost say; it lays around nine eggs and builds its nests in trees from hair and wool; and when the acorns are starting to come to an end, it hides a supply of them.

As regards the storks, it is repeated over and over by some people[630] that they are nourished in return by their offspring. Some say that the bee-eaters do this same thing too and are nourished in return by their offspring, not only in old age, but also as soon as the offspring are able; and the father and the mother remain in the nest. The appearance of the bird's feathers is yellow on the underparts; the upperparts, like those of the halcyon, are dark blue; the tips of the wings are red. In fall, it lays around six or seven eggs in overhanging banks that are soft; it burrows in up to four cubits.

The bird called the "greenfinch" (because its underparts are [greenish] yellow) is as
616ᵃ1 big as the lark; it lays four or five eggs. It builds its nest from comfrey, which it pulls up by the roots, and carpets it with hair and wool. Both the blackbird and the jay do the same thing and make the inside of the nest from these materials.

The nest of the *akanthullis* is built in a craft-like way; for it is plaited together like a ball of flax, and has a small entry.

People who live in those places say that there is also a cinnamon bird that carries what is called "cinnamon" from some place or other, and whose nest is built from it. It nests in high trees and in the young branches of the trees. They say that the native inhabitants, by attaching a lead weight to their arrows and shooting at them, cause the nests to fall down, and in this way collect the cinnamon from the debris.

627. 14.291.
628. 617ᵃ9.
629. Like the eagle.
630. E.g., Aristophanes, *Birds* 1355.

9.14
The Halcyon

The halcyon[631] is not much larger than a sparrow. Its color is dark blue, green, and light purple; the entire body, the wings, and the parts around the neck have these in a mixed way, not each of the colors separately; its beak is greenish yellow, long, and thin. Such, then, is its appearance. Its nest is very like sea balls—so-called *alosachnê*[632]—except in color; their color is reddish, and their shape is much the same as that of the long-necked gourds. Their size is bigger than that of the biggest sponges; indeed, there are both larger and smaller ones. They are covered with a roof and have an extensive solid part and hollow part. Even when being cut with a sharp knife, they are not quickly cut through, but when one is being cut at the same time as being shattered with one's hands, it quickly shatters into pieces like the *alosachnê*. The nest's mouth is narrow, enough for a small entrance, so that even if the nest is overturned, the sea does not come in. The hollow parts are much the same as those of the sponges. One might raise a puzzle as to what the halcyon makes its nest from; but it seems most likely that it is from the spines of the garfish; for it lives by eating fish. It also goes up rivers. It lays around five eggs at most. It gives birth throughout life, starting at four months.

9.15
The Hoopoe and Others

The hoopoe mostly builds its nest from human excrement.[633] It changes its appearance in summer and winter, like most of the other wild birds. **$616^{b}1$**

The titmouse lays the most eggs, so they say. But some say that the so-called blackcap in fact lays most (after the Libyan sparrow, at least); for seventeen eggs have been seen; however, it in fact lays more than twenty. It always lays an odd number, so they say. This bird too nests in trees; it feeds on larvae. A special affection of this bird and of the nightingale in comparison to other birds is not having a sharp point to their tongue.

The *aigithos* lives well and has many offspring, but is lame of foot.

The oriole is good at learning and clever at satisfying life's needs, but is a poor flyer and has an ugly color.

631. $542^{b}4$–17.
632. Literally, "sea-foam." Perhaps a zoophyte of some sort.
633. Cf. $559^{a}8$–11.

9.16
Two Other Unidentified Birds

The *elea* lives as well as any other bird, and in summer settles in shady place facing the wind, but in winter in a sunny and sheltered place in the reeds near marshes. It is small in size, but has a good voice.

The so-called *gnaphalos* has a good voice, a beautiful color, is clever at satisfying life's needs, and is graceful in form. It is believed to be a foreign bird; for it is rarely seen in places that are not properly its own.

9.17
Other Birds

The *krex*[634] is pugnacious in character; in thinking it is clever at satisfying life's needs, but is otherwise an ill-fated bird.[635]

The so-called nuthatch is pugnacious in character; in thinking it is quick, orderly, and clever at satisfying life's needs; it is said to be a sorcerer because it knows many things; it is prolific and is kind to its offspring; it lives by pecking wood.

The *aigôlios*[636] feeds at night and rarely appears during the day; and it too[637] dwells in rocks and caves; for it lacks courage,[638] but in thinking it is clever at satisfying life's needs and good at devising things.

There is a small bird called the *kerthios*; this one is daring in character, dwells in trees, and is an eater of woodworms; as for thinking, it lives well and has a clear voice.

The *akanthis*[639] lives badly and has a bad color; it does, however, have a sweet voice.

9.18
The Herons

Among the herons, the gray one, as was said,[640] mates with difficulty, but it is good at devising things, carries meals back to the nest, hunts well, and works during the day. Its color, however, is poor and its stomach always wet.[641] Of the remaining two

634. 609[b]8–11.
635. Perhaps also a bird of ill-omen.
636. 563[a]31.
637. Like the hubris and eagle (615[b]15–16).
638. The text is uncertain.
639. 593[a]1–3, 610[a]6–8.
640. 609[b]23.
641. *PA* 674[b]30–34.

(for there are three kinds of them), the white one has a beautiful color and mates **617ª1**
unharmed; it nests and lays well in trees; it feeds in marshes, lakes, plains, and meadows. The starry heron, the one called the "hesitater," is said in stories to have been 5
born of slaves in ancient times; in keeping with its name, it is the laziest of them. The herons, then, live in this way.

The so-called *pôugx* has a special affection in comparison to other birds; for among all the birds, it is most given to pecking out the eyes. It is at war with the *harpê*;[642] for it has a similar mode of life. 10

9.19
The Blackbirds

Of the blackbirds there are two kinds: one is black and occurs everywhere, the other entirely white, equal in size to the former, its voice much the same. It occurs on Mount Cyllene in Arcadia, but nowhere else. Similar to the black blackbird is the *laios*,[643] in size a little smaller; it spends its time on the rocks and roof tiles; it does not 15
have a red beak like that of the blackbird.

9.20
The Thrushes

Of the thrushes, there are three forms. One is the mistle thrush. It eats nothing but mistletoe and pine resin; its size is that of the jay. Another is the *trichas*. It has a sharp call; its size is that of the blackbird. Another, which some call the *ilias*, is the smallest 20
of these and less variegated.

9.21
The Bluebird

There is a rock bird whose name is the "bluebird." This bird occurs mostly on Nisyros and spends its time in the rocks. Its size is less than that of the blackbird, but a 25
little larger than that of the chaffinch. It is big-footed and climbs up the rocks. It is entirely blue. It has a beak that is thin and long, and short legs, very like those of the woodpecker.

642. 609ª24, 610ª11.
643. Perhaps the blue thrush.

9.22
The Oriole and the Malakokraneus

The oriole is entirely yellow. This bird is not seen in winter; it becomes especially seen around the summer solstice; it departs when Arcturus is rising. Its size is that of the turtledove.

The *malakokraneus*[644] always settles in the same spot and is caught there. As for its form, its head is large and cartilaginous, and it is a little smaller than the thrush; its beak is strong, small, and round; in color it is entirely ashen; it is fleet of foot but a bad flyer. It is mostly caught by the owl.

9.23
Other Birds

There is also the *pardalos*. This bird lives in herds, for the most part, and it is not possible to see one by itself. Its color is entirely ashen, its size much the same as those just mentioned; it is fleet of foot and not a bad flyer; its voice is loud and not low-pitched.

The *kolluriôn* eats the same things as the blackbird; its size is also the same as the previous ones. It is caught mostly in winter; but all these birds are seen in all seasons.

Further, there are the birds that are accustomed to living mostly in cities, the raven and the crow; for they too are seen in all seasons, and do not change their places or go into hiding.

9.24
The Jackdaws

Of the jackdaws there are three forms. One is the chough; it is as large as the crow and red-beaked. Another is the so-called wolf. Further, the small one, the joker. There is also another kind of the jackdaws around Lydia and Phrygia that is web-footed.[645]

9.25
The Larks

Of the larks there are two kinds. One stays on the ground and has a crest; the other lives in herds, not scattered about like the former; its color, however, is like the former's, though its size is smaller and it does not have a crest; it is eaten.

644. Literally "the soft-head." Perhaps the shrike.
645. Probably the little cormorant (cf. 593b18).

9.26
The Woodcock and the Starling

The woodcock is caught in gardens with nets; its size is that of the chicken, its beak long, its color like that of the francolin. It runs fast; it is moderately friendly to human beings.

The starling is variegated; its size is that of the blackbird.

9.27
The Ibises

The ibises in Egypt are of two sorts: the white ones and the black ones. The white ones occur in the rest of Egypt, but not in Pelusium, while the black ones do not occur in the rest of Egypt, but occur in Pelusium.

9.28
The Little Horned Owls

Among the little horned owls, some are always present in all seasons, and are called the "forever little horned owls"; they are not eaten because they are inedible. The others occur sometimes in fall; they appear for one day or for at most two; they are **618^{a}1** edible and very popular. They differ from the so-called forever little horned owls in (one might almost say) no respect other than fatness. Also, they are voiceless, while the others have a call. As regards their generation, nothing has been observed, except that they appear when west winds are blowing; that, though, is evident.

9.29
The Cuckoo

The cuckoo, as was said elsewhere,[646] does not build a nest, but lays in the nests of other birds, especially in those of the wood pigeons, and in that of the *hypolais* and the lark on the ground, and in a tree in that of the so-called greenfinch. It lays one egg, but does not brood on it itself; instead, the one in whose nest it has been laid is the bird that hatches and nourishes the chick. And, so they say, when the cuckoo chick grows, the mother bird ejects her [own] chicks, which perish in this way. Others say that after killing them, the one who is rearing them actually gives them to the cuckoo chick to eat; for because the cuckoo chick is beautiful she rejects

646. 6.7.

her own as unworthy. They agree to most of this as having come from their own observations. But about the destruction of the bird's chicks, they do not all say the same thing. Instead, some say that the cuckoo herself returns and eats the chicks of the host bird; some that, because of its superior size, the cuckoo chick is first to snap up the nourishment being offered, with the result that the other chicks perish from starvation; and some that, being stronger, it kills them while being nourished together with them.

It seems that the cuckoo is practically wise in doing its begetting of offspring; for because it well knows its own cowardice, and that it is unable to aid them, because of this it makes its own chicks into, as it were, suppositious children,[647] in order to save them. For this bird exceeds all in cowardice; for it has its feathers plucked out by the little birds and flees from them.

9.30
The Footless Birds

As for the footless birds, which some call the *kupselos*, that they are like the swallows was said previously;[648] in fact, it is not easy to distinguish them from the swallow, except that their shank is shaggy. They nest in long hive-like structures made of mud, with barely an entrance. They build the nests under cover, under rocks and in caves, so that they avoid both wild beasts and human beings.

The so-called *aigothêlas*[649] is a mountain bird, in size a little bit bigger than a blackbird, but smaller than a cuckoo. It lays two eggs or three at most; in character it is lazy. It flies to the female goats and milks them, hence its name. They say that, when it has milked the udder, the milk ceases and the goat goes blind. The bird is not sharp-sighted during the day but sees at night.

9.31
The Ravens

The ravens, in small spots and where there is not enough nourishment for more, occur only as a single pair. When their chicks are able to fly, they first eject them [from the nest], and then chase them away even from the place. The raven lays either four or five eggs. Around the times when the mercenaries of Medius were destroyed at Pharsalus,[650] the places around Athens and the Peloponnese became destitute of

647. I.e., not really the offspring of the ones who suppose them to be their own.
648. 487b24–31, but not mentioning the *kupselos* as such.
649. Literally, "goat-sucker."
650. In 404 BC or 395 BC.

ravens, suggesting the possession of some perception of communication issuing from each other.

9.32
The Eagles

Of the eagles there are several kinds. One is the so-called white-tail; it occurs in plains, groves, and cities; some call it the "fawn-killer." It flies both to the mountains and to the woods because it is confident; the remaining kinds rarely visit plains and groves.

Another kind of eagle is called the *plaggos*, which is second in size and strength. It dwells in mountain glens, hollows, and lakes, and is called the "duck-killer" and the *morphnos*. It is the one Homer mentions in the expedition of Priam.[651]

Another is black in color, the smallest in size, and the strongest of them; it dwells in mountains and woods and is called the "black eagle" and the "hare-killer." It is the only one that rears up its offspring and leads them out of the nest. It is quick-striking, orderly, unenvious, fearless, pugnacious, and keeps silent;[652] for it neither complains in low tones nor screams.

Further, another kind has dusky wings, a white head, a very large size, very short feathers, an elongated rump, and is like a vulture; it is called the "mountain stork" and the "sub-eagle,"[653] and dwells in groves. It has the same bad features as the others, but none of the good ones; for it is caught and pursued by the ravens and the other birds; for it is heavy, lives badly, carries off dead animals, is always hungry, and cries aloud and complains in low tones.

There is another kind of eagles, which are called "sea eagles." They have a neck that is long and thick, feathers that are curved, and a rump that is broad. They dwell near the sea and headlands. When seizing prey and unable to carry it off, they are often pulled down into the depths.[654]

Further, there is another kind of eagles, which are called the "pure-bred ones." They say that among the other birds too these are the only ones that are pure-bred; for the other kinds are mixed and adulterated by each other, and so are the eagles, the hawks, and the smallest birds. This is the largest of all the eagles; it is larger than the bearded vulture[655] and half again as big as the [white-tailed] eagles; its color is yellow. It seldom seen, like the so-called *kumindis*.[656]

651. *Iliad* 24.316.
652. Alternatively, "emits sounds of good omen."
653. Alternatively, "the *gupaetos*."
654. $620^{a}7$–10.
655. Cf. $592^{b}5$.
656. $615^{b}5$–10.

The eagle's time for working and flying is from lunchtime to evening; for it settles from dawn until the marketplace is full.

As eagles grow old, the upper beak grows ever more curved and in the end they die of starvation. It is said in a story, in fact, that this happens to it because once, when it was a human being, it wronged a guest-friend.

It puts away any residual nourishment for the chicks; for because it is not easy to procure it each day, they sometimes have nothing to bring from outside. They strike with their wings and tear with their claws anyone they catch inspecting around their nests. They build these not in the plains but in high places, mostly in precipitous rocks, but nonetheless in trees too. They rear the chicks until they become able to fly; then they expel them [from the nest] and drive them out of the entire place around it. For one pair of eagles hold power over a large place; which is why they do not allow others to encamp nearby.

They hunt not from places near their nests, but after having flown a long distance away. When one has hunted and caught something, it sets it down and does not immediately carry it off; instead, after trying its weight, it lets go of it [if it is too heavy]. Even the hares, it does not catch immediately, but after letting them go ahead
619b1 into the plain; and then it does not immediately come down to the ground, but from greater to ever lesser [heights] by slow degrees. It does both of these for safety, so as not to be caught in an ambush. Also, it settles in high places because of its slowness in rising from the ground. If flies high in order to look down on the largest place possible; that is why people say that it alone of the birds is divine.

All of the crook-taloned birds very seldom settle on rocks because, due to their crookedness, the hardness presents an obstacle.

The eagle hunts the hares, the fawns, the foxes, and all the others that it can overpower. It is long-lived; this is clear from the fact that its nest remains in the same place for a long time.

9.33
A Scythian Bird

In Scythia there is a kind of bird that is no smaller than the bustard. It gives birth to two chicks, but does not brood on them; instead, it leaves them hidden in the skin of a hare or fox. It guards them on top of a high tree, when it does not happen to be hunting; and if anyone climbs up, it fights him and strikes him with its wings, like the eagles.

9.34
Night Birds

The owls, the night ravens, and all the rest that are unable to see during the day procure their nourishment by hunting at night; they do not do this the entire night,

but as long as evening lasts[657] and around dawn; they hunt the mice, the lizards, the *sphondulê*,[658] and other small animals of this sort.

The so-called bearded vulture is kind to its offspring, lives well, carries meals back to the nest, is gentle, and rears not only its own offspring, but also those of the eagle. For when the eagle has ejected them from the nest, the bearded vulture, having taken them, nourishes them; for the eagle expels them prematurely, still in need of the means of life and not yet able to fly. The eagle, it seems, ejects its offspring because of envy; for it is by nature envious and ravenously hungry, and quick in seizing food besides. And it seizes large quantities of it, when it does seize it. It envies the chicks as they mature, then, because they become good eaters, and it tears at them with its claws. The chicks also fight among themselves over their place in the pecking order and their nourishment. The eagle expels them and strikes them. When they are being expelled, they cry aloud, and so the bearded vulture takes charge of them.

The bearded vulture has a white film over its eyes and a deformation in them. The sea eagle, by contrast, is very sharp-sighted, and compels its offspring, while they are still featherless, to look toward the sun; the one that refuses, it strikes and turns around; and whichever one of the two[659] is the first to get tears in its eyes, it kills; the other, it rears. It spends its time by the sea and lives by hunting the sea birds, as was said.[660] It hunts by catching them one by one, watching for one emerging from the sea. When the bird comes up and sees the sea eagle, it is frightened and plunges down again, so as to pop up somewhere else. But the sea eagle, because of its sharp sight, keeps flying after it until it either drowns the bird or catches it on the surface. For it does not attack birds in gatherings; for they keep it off by splashing it with their wings.

9.35
The Kepphos

The *kepphos*[661] are caught with foam; for they gulp it down; that is why they hunt them by sprinkling them with it. Their other flesh has a good odor, excepting the rump, which smells of black shoreweed.[662] They become fat.

657. Reading ἀλλ᾽ ἄχρι ἑσπερίου.
658. Probably an insect similar to a cockroach or *Blatta orientalis*.
659. $563^{a}17$–19.
660. Implied at $619^{a}6$–8; cf. $593^{b}23$–24.
661. $593^{b}14$.
662. $598^{a}5$.

9.36
The Hawks

Among the hawks, the strongest is the buzzard; second, the merlin; third, the *kirkos*.[663] The starry hawk, the wood pigeon killer,[664] and the *pternis* are other sorts. The broader hawks are called "half-buzzards." Others are the *perkos*, the sparrow hawks, the smooth hawks, and the toad-catchers. These live best and fly along the ground.

The kinds of hawks that differ from each other, some say, are no fewer than ten: for some strike and seize the common pigeon when it is sitting on the ground, but do not touch it when it is flying; others hunt it when it is sitting in a tree or something else of the sort, but do not attack it when it is on the ground or in the air; others do not touch it when it is sitting on the ground or on anything else, but try to seize it in flight. They say that the pigeons recognize each of these kinds, so that when one of them is flying toward them, if it is one of those that hunt in the air, they remain wherever they happen to be sitting; on the other hand, if the one flying toward them is one of those that strike on the ground, they do not remain there but instead fly away.

In the part of Thrace once called Cedripolis, people hunt the small birds in the marsh together with hawks; for the people, holding sticks, beat the reeds and the **620b1** undergrowth to make the small birds fly, while the hawks, appearing in the air above, pursue them; out of fear the birds fly down to the ground again; the people strike them with their sticks and seize them, and the hunters give a share to the hawks; for they throw some of the birds up in the air and the hawks catch them.

Also, around Lake Maeotis too they say that the wolves[665] are accustomed to the fishermen, and when they do not give them a share of the catch, they destroy their nets when they are drying on the ground.

As regards the birds, then, this is their mode.

9.37
The Marine Animals

As regards the marine animals too, it is possible to observe many craft-like things relating to the lives of each of them. For the stories repeated about the fishing frog—the so-called fisherman—are true, as are the ones about the torpedo fish. For the fishing frog is furnished with things hanging in front of its eyes, which are hair-like lengthwise, with a round thing at the tip, as if set on each side to serve as bait; when it has stirred up the sand or the mud, it hides itself, and lifts up the hair-like parts;

663. 9.36.
664. 615b7.
665. Perhaps λάρους ("gulls") should be read.

when the small fishes strike, it draws the parts in until it has brought them close to its mouth.

The torpedo fish, catching small fishes by producing numbness in the ones it is about to overcome with an instrument that it has in its body, nourishes itself on them; it hides itself in the sand and mud, and catches all the ones that, as they swim toward it, get numbed when they approach it. Some people have seen this happening themselves. The stingray also hides itself, though not in the same way.

There is a sign that these fishes live in this way; for they are often caught with mullets inside them, though they are themselves the slowest and mullets the fastest fishes. Next, when the fishing frog no longer has the things at the ends of the hairs, it is thinner when it is caught, while the torpedo fish is seen to cause numbness even in the human beings.

The hake, the ray, the *psêtta*,[666] and the angel fish hide in the sand and, when they have made themselves invisible, fish with the things in their mouth that the fishermen call "little fishing rods." The small fishes come to them taking them for seaweed, on which they nourish themselves.

Wherever the *anthias* is seen, there is no savage beast present; the sponge-divers use it as a sign when they are diving, and call these the "sacred fishes." But it seems to be a coincidence,[667] just as wherever there are snails, there is neither pig nor partridge; for both eat snails. **621^{a}1**

The sea snake[668] has a color and a body much the same as that of the conger eel, except that it is more tapered[669] and more violent. If it is frightened[670] and set free, it burrows down into the sand, boring a hole quickly with its snout; it has a mouth more pointed than that of the snakes.

The so-called sea millipede, when it has swallowed the hook, turns itself inside out, until it has expelled the hook; then it turns its inside back in again. The sea millipedes go toward things with an odor of greasy steam,[671] just like the land millipedes. They do not bite by means of their mouth, but by means of contact with the whole of their body, like the so-called sea nettles.

Among the fishes, the ones named "foxes,"[672] when they perceive that they have swallowed a hook, rescue themselves from this like the millipede; for they run a long way up the fishing line and bite it off; for they are caught in some places on lines with multiple hooks in rapidly flowing and deep waters.

The bonitos, for their part, collect together when they have seen some savage beast, and the largest of them swim around, and if it touches one, they drive it off.

666. 538^{a}20.
667. Though one holding for the most part.
668. 505^{b}8–12.
669. Reading μυουρότερος.
670. Reading φοβηθῇ.
671. *Mete*. 387^{b}6, 388^{a}5.
672. 565^{b}1, 566^{a}31.

They have strong teeth and cases have been observed of other fishes, even the *lamia*,[673] covered with wounds after falling among them.

Among the river fishes, the male sheatfish takes a lot of care of the offspring; for the female departs after laying the eggs, but the male keeps egg-guard where the largest quantity of embryo has been composed, providing no other benefit except that of keeping off the other small fishes lest they plunder the offspring; and he does this for forty or fifty days, until the offspring have grown and are able to flee from the other fishes. He is recognized by the fishermen wherever he happens to be egg-guarding; for, when keeping off the little fishes, he darts at them and makes a moaning sound. He stays by the eggs with such family affection that sometimes the fishermen, if the eggs are attached to the deep roots, draw them up to the lowest place they can. Nonetheless, he does not abandon the offspring, but if it so happens,[674] he is quickly caught with a hook because he is snatching up the small fishes that approach; but if he is accustomed to this and to biting hooks, he still does not forsake the offspring, but instead, by crushing them with his strongest teeth, he destroys the hooks.

621b1

All the fishes, both the migrants and the stationary ones, feed in those places in which they were born and in places like them;[675] for the nourishment proper to each is in these places. Those that wander around the most are the carnivorous ones; and pretty much all are carnivorous except for a few—for example, the mullet, the saupe fish, the red mullet, and the *chalkis*. As for the so-called *phôlis*, the mucus it discharges gets plastered around it and becomes like a lair.

Among the hard-shelled footless animals, the scallop moves the most and the furthest, flying by its own agency;[676] for the purpura and those like it move forward to a very small extent.

From the straits of Pyrrha the fishes swim out in winter because of the cold, except for the goby (for the strait is colder); as soon as it is spring, they swim back in. In the strait the parrot wrasse does not occur, nor does the *thritta*, nor any other of the more brightly colored fishes; nor the dogfishes, the spiny dogfishes, the crayfishes, the octopuses, the *bolitaina*,[677] and certain others; and among those that grow in the strait, the white goby is not a deep-sea fish.

Among the fishes, the egg-laying ones are at their prime in spring, until they have given birth, the live-bearing ones in fall, and in addition to these, the mullets, the red mullets, and all the others of that sort. The fishes around Lesbos—both the deep-sea fishes and the strait-dwelling ones—give birth in the strait; for they mate in the fall and give birth in the spring. The selachians also intermingle in fall, the males with the females, at their mating, but in spring they swim in, having separated until they give birth; at the time of their mating, many are caught yoked together.

673. 540b18.
674. Rejecting the addition of νέος.
675. 589a10–22.
676. 528a30–32.
677. 525a19–20.

Among the soft-bodied animals, the cuttlefish is the most cunning, and alone uses the ink for concealment—and not only when frightened; the octopus and the calamary emit the ink because of fear. None of these ever emits all the ink at once; and when they have emitted it, it increases itself again. But the cuttlefish, as was said, often uses the ink for concealment, and having made a feint to the front, turns into the ink. Further, it hunts with its long tentacles not only the small fishes, but often even the mullets. **622^a1**

The octopus, though foolish (for it in fact comes toward a person's hand if he puts it under water), is a good household manager;[678] for it collects everything together in the lair where it happens to live, and having consumed the most useful parts, it ejects the shells and the cases of the crabs and shellfishes and the bones of the small fishes. Also, it hunts the fishes by changing color and making it like whatever rocks it comes near to. It does the same thing when it is frightened. It is said by some people that the cuttlefish also does this; for they say that it makes its own color like that of the place where it spends its time. But among the fishes, the angelfish alone does this; for it changes its color like the octopus.

The majority of the octopus kind does not live for more than a year; for by nature it dissolves easily. There is a sign of this: for when it is being pounded,[679] it always loses something and, in the end, disappears. The females, after giving birth, are more subject to this, and become sluggish, and do not perceive that they are being tossed about by the waves, and it is easy to dive down and catch them by hand; they become slimy, and no longer hunt things that are nearby. The males become leathery and viscous.

A sign of their not living for more than a year seems to be the fact that after the generation of the baby octopuses—at any rate, in summer and toward fall—it is no longer easy to see a large octopus, while a little before that time the octopuses are at their largest. When the eggs have been laid, both the male and the female are said to become so old and weak that they are eaten by the small fishes and easily dragged from their lairs, while previously they suffer nothing like that. Further, they say that the small young octopuses suffer nothing of that sort after their generation, but rather are stronger than the larger ones. The cuttlefish also does not live longer than a year. The only soft-bodied animal to go out onto dry land is the octopus; it moves by walking on the rough ground, but it avoids the smooth. In other parts the animal is strong, but weak in the neck, when one squeezes it. **622^b1**

As regards the soft-bodied animals, then, this is their mode.

As for the clams,[680] they say that the ones that have a thin, rough shell produce around themselves a sort of hard thorax, and make this larger when they become larger, and that come out of this as from a sort of lair or house.

678. *NE* 1141^b32.
679. To tenderize it.
680. 528^a22–26.

The nautilus octopus too,[681] both in its nature and in what it does, is remarkable; for it sails on the sea, when it has made its ascent from the depths; it ascends with its shell turned downward, in order to go up more easily and navigate with it empty, but when it has surfaced, it turns it upward again. It has a web between its tentacles up to a certain point; it is like what is between the toes in the web-footed [birds], except that in those it is thick, while in these it is thin and spiderweb-like. It uses this as a sail, when there is some wind; in place of steering oars it lets down two of its tentacles by the sides. If it is frightened, it sinks down into the sea by filling its shell [with water]. Concerning its generation and its growth together with that of its shell no exact observation has yet been made, but it seems not to come to be from mating, but to grow like the other shellfishes.[682] It is also not yet clear whether, when stripped of its shell, it is capable of living.

9.38
The Insects

Among the insects the most industrious animals—and even compared to pretty much all the other animals—are the ant kind and the bee kind, and further, the hornets, the wasps, and (one might almost say) all the ones that are of the same kind as these. Among the spiders, the smoother[683] ones are the most lithe[684] and the most craft-like as regards their life. The work done by the ants is obvious for all to see, and the way they always go on one path, put aside nourishment and store it; indeed, they even work at night when there is a full moon.

9.39
The Spiders

Of the spiders and the venom-spiders there are many kinds. Of the biting venom-spiders there are two: one, which is like the so-called wolf-spiders, is small, variegated, pointy, and good at jumping, and is called the "flea"; the other is larger, black in color, with long front legs, sluggish in movement, walks softly, is not strong, and does not jump. Of all the others, the ones the medicine-makers provide, some have no bite,
623ᵃ1 others a weak one. The so-called wolf-spiders are another kind.

The small kind of spider does not weave a web; the larger kind weaves a rough poor-quality web on the ground and in dry-stone walls; it always builds the web over the openings and, while staying inside, watches over the starting-threads, until

681. 525ᵃ20–26.
682. 5.15, *GA* 3.11.
683. 555ᵇ11.
684. Or, perhaps, "slimmest."

something moves them when it falls in; then it attacks. The variegated kind builds a small poor-quality web under the [branches of] trees.

There is another, third kind of spider that is the wisest and the smoothest[685] one; for the female weaves by first stretching threads to the limit points of her web in every direction; then she lays down the spokes from the middle (she grasps adequately where the middle is); into these she inserts the woof threads, as it were, and then weaves them together. She makes her lair and the place to put aside the prey elsewhere, but hunts from the middle, where she is keeping watch. Then, when something has fallen in and the middle has been moved, she first binds it and winds the web-threads around it until she has made it helpless; after that, she lifts it up and carries it away; if she happens to be hungry, she sucks out its juice (for this is her pleasant reward); otherwise, she sets off to hunt again, having first mended the break in the web. If in the meantime anything has fallen in, she first goes to the middle, and from there goes back to what has fallen in, just as at the start. If something damages the spiderweb, she starts the web again when the sun is going down or rising, because it is mostly at those times that beasts fall in. It is the female who does the work and hunts; the male shares in the pleasant rewards.

Among the smooth spiders that weave a dense web there are two kinds, one bigger, one smaller. The first, which has long legs, keeps watch while suspended below the web, in order that the beasts not be frightened and take care, but fall in above her (for because of her size she is not easily hidden). The second, which is better proportioned, hides herself in the upper part of the web in a small hole.

The spiders are able to emit web immediately after birth, not from inside as a residue, as Democritus says, but from off the body like tree-bark, or as the animals do that shoot out their hairs—for example, the porcupines. The spider attacks and winds web around even the larger animals, since it throws it around even the small lizards, running around their mouth[686] emitting web until it has closed the mouth. **$623^{b}1$** Only then does it approach and bite it.

As regards these animals, then, this is their mode.

9.40
The Bees

There is a kind of insects that are not named by a single name, but that all have a shape of the same kind. These are all the ones that make wax combs—for example, the bees and those of much the same shape. There are nine kinds of these, six of which are herd animals: bees, the king bees, the drones that are among the bees, the annual wasp, and further, the hornet, and the *tenthrêdôn*.[687] The solitary ones are

685. Or, perhaps, "subtlest."
686. Reading στόμα.
687. Perhaps the wasp that nests in the earth. See $629^{a}31–^{b}2$.

three: the small siren, which is white;[688] another siren, which is larger, black, and variegated; and third, the so-called bumblebee, which is the largest of these.

The ants, for their part, hunt nothing, but collect things readymade; the spiders produce nothing and put nothing aside,[689] but only hunt their nourishment. But of the nine kinds just mentioned, the rest of which will be spoken about later,[690] the bees hunt nothing but produce their nourishment themselves and store it away; for the honey is nourishment for them. They make this clear when the beekeepers attempt to remove the combs; for when the bees are being fumigated and are suffering severely from the smoke, it is then especially that they eat the honey, while at other times they are not seen to do so very much, as if they are being thrifty with it and putting it aside for their nourishment. They have another nourishment too which some call *kêrinthos*;[691] this is inferior and has a fig-like sweetness; they bring it on their legs like the wax.

There is much variation regarding the work done and the mode of life of these insects. For after the hive has been given to them clean, they build the wax combs, bringing the tears of juice from the various flowers and the trees, from the willow, the elm, and others that produce a lot of gum. They also smear the bottom [of the comb] with this on account of the other beasts. The beekeepers call this *konisis*.[692] They also narrow the entrances by building, if they are wide.

They first fashion the combs in which the bees themselves come to be, then those in which the so-called kings and the drones come to be. They fashion their own all the time, those of the kings when not many offspring are generated, and those of the drones if the honey gives signs of being plentiful. They fashion those of the kings near their own, and these combs are small, and those of the drones against these; these are smaller in size than those of the bees. They start the comb-webs from above, from the top of the hive, and below producing many comb-webs woven together, until they reach the bottom. The openings, both for the honey and for the grubs, have two entrances; for there are two openings on a single base, like that of the double-cups,[693] one inside and one outside. The comb-webs attached to the hives at the starting-points of the combs, extending in a circle for as much as two or three rows, are willow and empty of honey; the fuller combs are the ones most plastered over with wax.

At the entrance of the hive, the first part of the entryway is smeared all over with *mitus*; this is deep black, and for the bees is a sort of by-product from the wax, with an acrid odor; it is a remedy for stings and abscesses of this sort. The smearing that is contiguous to this is *pissokêros*, which is less pungent and less medicinal than *mitus*.

688. Reading φαλός.
689. Except short-term. See 623ᵃ12.
690. 627ᵇ23–629ᵇ2.
691. 554ᵃ17.
692. Reading κόνισιν.
693. Probably shaped like an hourglass.

Some say that the drones fashion combs by themselves both in the same hive and in the one single comb they divide with the bees; they make no honey, however, but nourish both themselves and the young on that of the bees. The drones spend most of their time inside the hive; if they do fly out, they are borne upward to the sky in a stream, whirling around and taking exercise, as it were. When they have done this, they come back inside and eat their fill.

The kings do not fly out, except with the whole swarm, neither for getting food nor for anything else. They say too that if the swarm has gone astray, they turn back until they find the leader by his odor. It is also said that he is carried by the swarm when he is not able to fly, and that if he perishes, the swarm perishes; but if they do survive for a certain time and make combs, no honey is produced, and they quickly perish.

The bees collect the wax in scrambling quickly up against the blossoms with their front feet; they wipe these off onto the middle ones, and the middle ones into the **$624^{b}1$** hollows of the back ones; and having filled them full in this way, they fly off, and are clearly weighed down. On each flight the bee does not go to flowers distinct in form—for example, it goes from iris to iris, and does not touch any other, at any rate, until it has flown back to the hive. When they have arrived at the hive, they shake themselves, and three or four bees attend to each one. What they receive is not easy to see, nor has their mode of working on it been seen; but the collecting of wax has been observed on olive trees: because of the density of their leaves the bees remain in the same place for a longer time.

After this they nest. Nothing prevents young bees, honey, and drones from being present in the same comb. If the leader is alive, they say that the drones come to be separately; otherwise they come to be in the bees' cells by the bees, and these ones become more spirited; that is why in fact they are called "stinged," not because they have stings, but because, though they wish to strike, they are not able to. The cells of the drones are larger. Sometimes the bees fashion the combs of the drones to be separate by themselves, but for the most part, they fashion them among those of the bees; that is why people cut them out.

There are several kinds of bees, as was said previously.[694] There are two kinds of leaders: the better one is yellowish-red, the other black and variegated; their size is double that of the worker bees. The best is small, round, and variegated; another is large and similar to the hornet. Another is the so-called robber, black with a flat abdomen. Further, the drone; in size this is the largest of all, but stingless and sluggish.

There is a difference between the bees that come to be from those that forage from cultivated plants and the bees that come to be from those that forage from mountain ones; for those from the ones living in the woods are hairier, smaller, more industrious, and more bad-tempered.

694. $553^{a}25–27, {}^{b}7–11$ (more or less repeated here).

The worker bees make the combs even and also the outer covering entirely smooth; further, the comb is of a single sort—for example, entirely for honey, or for the young, or for drones. But if it happens that they produce all of them in the same comb, there will be one continuous form constructed by means of a hold.[695] The long
625ᵃ1 bees, by contrast, make the combs uneven and the covering swollen up like that of the hornet; and further, the seed and the other things are not placed in order, but as luck would have. From these come the bad-quality leaders, many drones, and the so-called robbers, but very little or no honey.

The bees brood on the combs and concoct them; if they do not do this, they say that the combs are destroyed and become covered in cobwebs.[696] And if they are able to gain possession of the rest of the comb by brooding on it, this other part becomes like a piece eaten away; otherwise, both parts are destroyed. In the destroyed parts small larvae come to be which grow wings and fly away.

Also, the bees set upright the combs that are falling over, and put supports under them, in order to be able to pass underneath; for when they have no route by which to approach, they cannot brood on them, and they become covered in cobwebs.

The robber and the drone, once they have come to be, do no work at all, but damage that of the others. When they are caught, they are killed by the worker bees. They also kill violently the majority of the leaders, especially the bad-quality ones, in order that there not be many leaders to break apart the swarm. They mostly kill them when the hive is not generating many offspring and no release of swarms is about to occur; for at these times they even destroy the combs of the kings (if they have been established), as being the ones that lead out the swarms.

They also destroy the combs of the drones if there are indications of a shortage of honey and the hives are not well supplied with honey. It is then that they fight most about the honey with those who are removing it, expel the drones that are present, and are often seen sitting apart in the hive.

The small bees fight violently with the long kind and try to expel them from the hives; if they prevail, it is believed that this hive becomes exceedingly good. But if the others are left in control of themselves, they idle, in the end produce nothing good, and die themselves before fall. Whenever the worker bees kill, they try to do so outside the hive; if one dies inside it, they likewise take it out.

The so-called robbers not only damage the combs in their own hives, but also, if
625ᵇ1 they are unnoticed, enter those of others; if caught, they are killed. It takes work to go unnoticed; for there are guards at every entrance, and even if the robber himself got in unnoticed, due to overfilling himself he is unable to fly, but rolls around in front of the hive, so that it takes work for him to escape.

695. Reading ἀντλίας. The idea, perhaps, is that the comb is like the hold (*antlia*) of a ship in which cells of different sorts are contained within a single uniform structure.
696. 605ᵇ9–11, 626ᵇ17–19.

The kings themselves are not seen outside otherwise than together with a swarm; in the process of swarming, the rest of the bees appear in close order around the king. When swarming is about to occur, a monotonous and special sound is made for several days, and two or three days before a few bees fly around the hive. Whether the king occurs among these has not yet been observed, because it is not easy to do so. When they have collected together, they fly off and form separate swarms around each of the kings. But if a small swarm happens to settle down near a large one, the small swarm migrates to the large one, and if the king they have abandoned follows along with them, they destroy him. As regards departure and swarming, then, this is the mode in which they occur.

There are bees assigned to each sort of work—for example, some bring juice from flowers, some bring water, some smooth and set right the combs. They bring water when they are nourishing offspring. They do not settle on any animal flesh, nor do they eat cooked food. There is no accustomed time for them to start to work, but if they have the requisite provisions and live well, it is more in the spring of the year that they undertake their work, and when the weather is good, they work continuously. Also, a young bee, on the third day after it has cast off [its membrane], immediately goes to work, if it has nourishment. And when a swarm is settled somewhere, some bees turn aside to search for nourishment, and then come back again.

In hives that are thriving, bee production is interrupted for only around the forty days after the winter solstice. Whenever the young have grown, they put nourishment beside them, and put on a coat of wax; when it is able, the young bee breaks open the covering and comes out. The beasts that come to be in the hives and damage the combs are cleaned out by the worker bees, but the other bees, because of their badness, look with indifference on the destruction of their works.

When the beekeepers are removing the combs, they leave the bees nourishment **626^{a}1** for the winter; if it is sufficient, the hive is preserved; otherwise, if there is wintery weather, they die there; but if the weather is good, they abandon the hive. For nourishment they use honey both in summer and winter; but they also put aside another nourishment resembling wax in its hardness, which some name *sandarakê*.[697]

The bees are injured the most by the wasps, the birds called "titmice," and further, by the swallow and the bee-eater. They are hunted by the marsh frogs too when they go for water and encounter them; that is also why the frogs are chased by the beekeepers from the marshes where the bees get water, and why they also remove the wasp nests, the swallows, and the bee-eater nests that are near the hives. Bees flee from no animals except themselves. But their battle is both against themselves and against the wasps. Away from the hive they injure neither each other nor any other animal, but near the hive they kill any they overpower.

Those that sting perish because the sting cannot be removed without the intestine; for often the bee is preserved, if the person stung takes care and squeezes out the

697. Usually red sulfide of arsenic ($604^{b}28$), but here probably beebread ($554^{a}17$).

sting; but when it loses its sting, the bee dies. They kill large animals when they sting them—for example, a case has been observed of a horse being killed by bees. The leaders are the least bad-tempered and sting least.

The bees that die are carried out of the hive. And in all other respects the animal is most cleanly; that is why in fact they often discharge their residue while flying, because it is foul-smelling. They are annoyed, as was said,[698] by foul-smelling odors and by those of perfumes; that is why, in fact, they sting those who use them.

They die because of various coincidences, especially when the leaders become numerous and each leads away a part of them. Also, the toad destroys the bees; for coming to the entrance of the hive, it blows in, and watching for them as they fly out, eats them. It can suffer nothing bad from the bees, but the person taking care of the hive kills it.

626b1 As for the kind of bees that was said[699] to be of bad quality and to make the combs rough, there are some beekeepers who say that it is mostly the young bees that do this, because of lack of knowledge (the current year's bees are the young ones). Likewise, the young bees do not sting in the same way either; that is why the swarms can be carried; for they consist of young bees. When the honey has started to come to an end, the bees expel the drones, and the beekeepers throw in figs and sweet things for these.

The older bees work inside the hive, and are hairy because they remain inside, while the young bees fetch from outside and are smoother. Also, they kill the drones when they no longer have space to work; for they are in the innermost part of the hive.

A case has been observed where, when a hive had become unhealthy, some of the bees went to another hive and, being victorious in the fighting, carried out the honey. Then, when the beekeeper was killing them, the other bees came out to get vengeance and defend themselves, but did not sting him.

Diseases[700] mostly attack hives that are thriving, including the so-called *klêros*; this is when small larvae occur on the floor of the hive, from which, when they grow, spiderwebs of a sort come to occupy the whole hive, and the combs putrefy. Another disease is like a sort of laziness that occurs in the bees along with a foul odor in the hives.

Thyme is a source of food for the bees, and the white is better than the red. The place of the hive should not be warm in the stifling heat of summer, but in winter it should be warm. They especially become sick when the plant they are working on is mildewed. When the wind is strong, they carry a stone on themselves as ballast against the wind. They drink, if there is a river nearby, from nowhere else but from

698. Perhaps 623b20.
699. 625a4.
700. 8.27.

there, having first deposited their load; but if there is no river, they drink elsewhere, vomit up the honey,[701] and proceed immediately to work.

They have two seasons for working on the honey, spring and fall. The spring honey is sweeter, paler, and altogether better than the fall honey. The better honey comes from new wax and young plants. The red honey is inferior because of its honeycomb; for it is destroyed like wine by its container; that is why it needs to be dried. When the thyme is in flower and the comb becomes full, this honey does not solidify. It **627ª1** is the golden honey that is good; the pale does not come from pure thyme, but it is good for eyes and sores. The weak part of the honey always floats to the surface and should be removed; the pure honey is underneath.

When the woods are in bloom, the wax is worked on; that is why it is then that one should take the wax out of the beehive; for then they go to work immediately. The plants they fetch from are the following: the *atraktullis*,[702] the honey lotus, the asphodel, the myrtle, the flowering reed, the chaste tree,[703] and the broom. When they are working on the thyme, they mix in water[704] before smearing over the comb.

All the bees discharge their excrement, as was said,[705] either while flying or else into one comb. The small bees are more industrious than the large ones, as was said;[706] they have battered wings, a dark color, and are sun-burnt. The bright and resplendent ones, just like [pale] women, are lazy.

The bees seem to like rattling noises too, which is why, they say, people collect them into the hive by rattling with pots and pebbles; it is not clear, however, whether they hear anything at all,[707] or whether they do this due to pleasure or to fear.

The bees expel both the lazy ones and those that are not thrifty. The sorts of work, though, have been divided, as was said previously,[708] and some work on combs, some on the honey, some on *erithakê*;[709] also, some are fashioning combs, others carrying water to the cells and mixing it with the honey, others going to work. At daybreak, they keep silent, until one bee awakens them by buzzing two or three times. Then they all fly out together to work; when they return, they are noisy at first, but little by little become less so, until a single bee flies around buzzing, as if giving the signal for sleep; then suddenly they get silent.

The hive is diagnosed to be strong by its noise being loud and by the movement of bees going out and coming in; for then they are working on the larvae.

701. $554^{a}17$–18.
702. *Carthamus lanatus*.
703. *Vitex agnus-castus*.
704. $627^{a}23$.
705. $626^{a}25$.
706. Implied at $624^{b}24$.
707. Cf. *Met*. $980^{b}23$–25.
708. $625^{b}18$–20.
709. $554^{a}17$.

They are most hungry when they start working after winter. But they become lazier, if one leaves too much honey when harvesting [the combs]; instead, one should leave combs in proportion to the quantity of bees; for they also work with less spirit if too few are left. They also become lazier if the beehive is large; for they labor with less spirit. The harvest from a hive is a *chous* or three half-*choes*, and from thriving ones, two *choes* or five half-*choes*. [Only] a few hives give three *choes*.

The sheep are an enemy of the bees, and so are the wasps, as was also said previously.[710] The beekeepers hunt the wasps, putting out a dish and throwing meat into it; when a number of wasps light on it, they cover it with a lid and put it on the fire. When a few drones are present, it benefits the hive; for they make the bees more industrious.

The bees foretell both storm and rain. There is a sign of this; for they do not fly off [despite the] good weather, but crowd together by the hive, by which the beekeepers know that they are expecting a storm. When they hang from each other in the hive, it is a sign that the swarm is about to leave. But the beekeepers sprinkle the hive with sweet wine when they perceive this.

It is advantageous to plant around the hives wild pear trees, beans, Median grass,[711] Syrian grass, *ôchros*,[712] myrtle, poppy, creeping-thyme, and almond.

Some beekeepers recognize their own bees in the place where they get food by having dusted them with flour.

If spring is late, or if there is a drought, or when there is mildew, the bees have less seed to work on.[713]

As regards the bees, then, this is their mode.

9.41
The Wasps

As for the wasps, there are two kinds. The wild ones of these are rare; they occur in the mountains, and give birth not underground but in the oak trees; in shape they are larger and more elongated, and more black in color than the others, but variegated; they all have stings, are more aggressive, and sting more painfully than the others; for in fact their sting is proportionally larger in size to that of the others. These wasps live for more than a year and are seen even in winter flying out of oak trees when they are cut down. They live in hiding during winter and spend their time in the trunks of trees. Some of them are mothers,[714] others workers, just as in the tamer ones.

710. 626a8.
711. 522b26.
712. Perhaps *Lathyrus ochrus*.
713. 553b19–23.
714. Literally, "wombs."

What the nature is of the workers and the mothers will be clear from the case of the tamer ones. For among the tame wasps there are also two kinds, the leaders, **628^{a}1** which are called "mothers," and the workers. The leaders are much larger and gentler. Also, the workers do not live for more than a year, but all die when winter comes in (it is evident that this is so; for at the start of the winter their workers become 5 sluggish, and around the solstice are not seen at all). The leaders, on the other hand, the ones called "mothers," are seen throughout the winter and go into hiding underground; for, while plowing and digging in winter, many people have seen mothers, but no one has seen workers.

The generation of the wasps is as follows. The leaders, when they have picked a 10 sheltered place at the onset of summer, fashion the combs and establish what are called small "wasp-combs"[715]—that is to say, with four openings or thereabouts—in which wasps come to be, but not mothers. When these wasps have grown, the leaders again construct other larger ones after these, and others again when these have grown, 15 so that, when fall is ending, very many of the largest wasp-combs have been produced in which the leader, the so-called mother, generates no longer wasps but mothers. These come to be up above, toward the surface of the wasp-comb, as larger larvae, in contiguous cells of four or slightly more, and in much the same way as those of the 20 leaders[716] come to be in the combs [of the bees].

After the worker wasps have come to be in the combs, the leaders no longer work; instead, the workers bring them in their nourishment. This is made evident by the fact that the leaders of the workers no longer fly out but remain quiet inside. Whether the previous year's leaders, when they have generated new leaders, are killed by the 25 new wasps, and this happens [always] in the same way, or whether they are able to live for a longer time, no one has yet observed; nor has anyone yet been seen who has himself observed old age in either a mother or in the wild wasps, or any other affection of this sort.

The mother is broad and heavy, both thicker and larger than the wasp, and 30 because of its weight, not very strong in flying; nor can they fly for a long distance; that is why in fact they sit in the wasp-combs all the time, fashioning and managing things within.

In most wasp-combs the so-called mothers are present. But there is dispute as to 35 whether they have stings or are stingless. It seems likely that, like the leaders of the **628^{b}1** bees, they do have stings but neither put them out nor strike.

Among the wasps, some are stingless like the drones; others have a sting. The stingless ones are smaller, feebler, and do not defend themselves; the ones with stings are larger and more aggressive. Some people call the latter "males," and the stingless 5 ones "females." At the approach of winter, many of those with stings are believed to lose them; but we have not yet met an eyewitness.

715. Reading σφηκωνεῖς τοὺς μικρούς.
716. I.e., the king bees.

The wasps occur more in droughts and in rugged places; they come to be underground and fashion their combs from debris and earth, each from a single starting-point, as from a root. The nourishment they use comes from certain flowers and fruits, but mostly from animal flesh. Some of the other wasps[717] have been observed mating; but whether both were stingless or had stings, or one did and the other did not, no one has yet observed. Some wild ones have also been seen mating, one of which had a sting; but concerning the other there was no observation.

The offspring does not seem to come to be from giving birth, but from the outset seems too large to be born from a wasp.[718]

If one grasps a wasp by its feet and allows it to buzz with its wings, the stingless ones fly toward it, but the ones with stings do not fly toward it. Some people use this as a proof that the first are males, the second females. Both those with stings and those without stings are caught in caverns during the winter.

Some build a few small wasp combs; others build many large ones. The so-called mothers are caught at the change of season, mostly around elm trees; for they collect the viscous and gum-like stuffs. The mothers occur in large numbers where in the previous year there were many wasps and heavy rains. They are hunted around the cliffs and vertical clefts in the ground, and it is evident that all of them have stings.

As regards the bees, then, this is their mode.

9.42
The Hornets

The hornets live not by gathering from flowers like the bees, but mostly from eating flesh (that is also why they stay around excrement; for they hunt the large flies, and when they have caught them, they remove the head, and fly off carrying the rest of the body); they also feed on sweet fruit. For nourishment, then, they use what was mentioned. They have leaders like the bees and the wasps; and these leaders are larger in size in proportion to the hornets than the leader of the wasps is in proportion to the wasps, and the leader of the bees in proportion to the bees. This one too spends its time inside like the leader of the wasps.

The hornets build their hive underground, carrying out the earth like the ants; for swarming, like that of the bees, does not occur with them or with the wasps; instead, younger ones are always added on, and by staying there, make the hive larger by carrying out the soil. The hives become very large; indeed, cases have been observed where from a thriving hive three or even four baskets full of combs have been removed. They do not, like the bees, put aside nourishment, but go into hiding for the winter, and most of them die; whether in fact they all do is not yet clear.

717. I.e., the tame ones.

718. Though in fact it is (628ᵃ18, 629ᵃ36, *GA* 721ᵃ5, 761ᵃ6).

No more than one leader comes to be in their hives, as there is in those of the bees, where the leaders of the bees break apart the hives. But when some of the hornets have strayed from the hive, they gather together on some tree and produce combs, of precisely the sort that are often seen when on the surface, and in this they generate one leader; and he, when he has emerged and grown, leads them away and settles them together with himself in a hive.

About the mating of the hornets nothing has yet been observed, nor where the offspring comes from.[719] In the bees, both the drones and the kings[720] are stingless, and some of the wasps are stingless, as was said previously,[721] while the hornets are all seen to have stings. But where the leader is concerned, it must in fact be investigated more to see whether he has a sting or not.

9.43
The Bumblebees and the Tenthrêdôn

The bumblebee gives birth to its offspring under a stone on the ground itself, in two cells or slightly more; and there also occurs the start of a poor sort of honey in these.

The *tenthrêdôn* resembles the hornet but is variegated, and its breadth is like that of the bee. Being gluttonous, it flies alone into butcher's shops, fishmongers, and such places of indulgence. It gives birth underground like the wasps, and is prolific; the *tenthrêdôn* nest is much larger than that of the wasps and more elongated. **$629^{b}1$**

As regards the bees, the wasps, and the others of this sort, then, this is their mode of working and of life.

9.44
The Lion and the Thôs

As regards the characters of the animals, as was also said previously,[722] it is possible to observe differences especially in relation to courage and cowardice, then, also in relation to mild-manneredness and wildness, even among the wild animals themselves.

For even the lion, although it is most dangerous when feeding, when it is not hungry and has fed, is very mild-mannered. In character it is neither nervous of anything nor suspicious of anything, and toward those reared with it and it is accustomed to, it is very playful and affectionate. In hunts, even when seen, it never runs away or

719. Cf. *GA* $761^{a}2$–10.
720. Cf. $628^{b}2$.
721. $628^{b}3$.
722. $588^{a}21$–25, $608^{a}11$–17, $610^{b}20$–22.

cowers in fear, but if it is compelled to withdraw because of the number of hunters, it retires gradually, walking laterally,[723] and every now and then turning its head; if, however, it reaches thick cover, it flees quickly, until it stands in plain view; then it again retires gradually. In open country, if it has been compelled by the number [of hunters] to flee in plain view, it runs stretched out and does not leap. When running, it is continuously stretched out like a hound; when it is pursuing something, however, it throws itself on it, when it is near. And what is said about it is true, that it is most afraid of fire—as Homer says in his poem: "and flaming torches which, though furious, it dreads"[724]—and that it keeps watch on the hunter who throws and hits it and hurls itself on him. But if one throws and does not hit it, though he annoys it, then if by rushing at him it can catch him, it does not injure him or hurt him with its claws, but when it has shaken and frightened him, lets him go again.

The lions approach cities and injure people mostly when they have become old, since they are unable to hunt because of their age and because their teeth have been damaged. They live for many years. In fact, a lion that was captured lame had many of its teeth broken, which some people furnish as proof that they live for many years; for this could not have happened to an animal that had not lived a long time.

There are two kinds of lions. Of these, the one that is rounder and has curlier hair is more cowardly, while the longer one with straight hair is more courageous. Sometimes they flee with their tails extended like the hounds. Once a lion was seen on the point of attacking a pig and, when it saw the pig bristle up in defense, fleeing. It cannot bear blows to its flanks, but to the rest of its body it can take many, and its head is strong. In everything it has bitten or wounded with its claws, discharges of very yellow serum run from the wounds that cannot be washed out of the bandages and sponges with anything. The treatment is the same as for wounds caused by dog bites.

The *thôs*[725] too are friendly to human beings, and neither harm people nor are very afraid of them; but they are at war with the dogs and the lions; that is why they do not occur in the same place. The small *thôs* are the best. Some people say that there are two kinds of *thôs*, others three. But it seems that there are not several kinds, but rather that, like some of the fishes, the birds, and the four-footed animals, the *thôs* also change in accord with the seasons, and have one color in winter and another in summer, and in summer become smooth and in winter shaggy.

9.45
The Bison

The bison occurs in Paeonia on Mount Messapium, which separates Paeonia from Maedica; the Paeonians call it the *monapos*. In size it is as large as a bull; it is more

723. 498b7–10.
724. *Iliad* 11.554, 17.663.
725. 507b17.

bulky than the ox; for it is not elongated. The skin when stretched out covers a seven-couch dining room. In general, its form is like that of an ox, except that it has a mane down to its shoulder like a horse; but its hair is softer than that of the horse and lies closer to the body. The color of its hair is yellowish, and the mane is deep, reaching down to the eyes, and thick. The bison's color is a mean between ashen and red, not like that of the horses called "chestnut," but its hair is rougher above and wooly below. Black ones or very red ones do not occur. They have a voiced sound like that of the ox. Their horns are crooked, turned toward each other, and useless for defense. In size they are a span or a little more, and of such thickness that each would hold not much less than a half-*chous*. The blackness of the horn is beautiful and shiny.

The forelock reaches down to the eyes, with the result that the bison sees better to the side than to the front. It has no upper teeth, like the ox and all the horned animals; its legs are shaggy; it is cloven-hoofed; its tail is too small in proportion to its size and is like that of the ox. It throws up the dust and digs like the bull. Its skin is strong against blows. Its flesh is pleasant tasting, and that is why people hunt it. When it is struck, it flees, and stands its ground when it is tired out. It defends itself by kicking and by voiding excrement, throwing it up to four rods away from itself; it employs this easily and often, and it scorches the hounds' hair so that it scrapes off. It is when the bison is agitated and frightened that its excrement does this, but when the bison is not agitated it does not scorch.

This, then, is what the form and nature of the beast is.

When it is time to give birth, they give birth in a gathering in the mountains. They first discharge excrement around the place before giving birth and make a sort of rampart; for the beast discharges a large quantity of this residue.

9.46
The Elephant

The most easily domesticated and tamest of the wild animals is the elephant; for there are many things that it both learns and is aware of, since elephants are even taught to kneel before the king. It is also keenly perceptive and in comprehension surpasses the other animals. When it has mated with one female and made her pregnant, it does not have intercourse with that one again.[726]

Some people say that the elephant lives for two hundred years, others for one hundred and twenty,[727] that the female lives pretty much the same number of years as the male, that its prime is at around sixty years, and that it is sensitive to cold winters and frosts. The animal occurs dwelling by rivers but is not a river animal. But it moves by walking even through water and goes on as long as its trunk is held above it; for it

726. $546^{b}10–11$.
727. Cf. $596^{a}9–11$.

is through this that it blows upward and does its breathing. But it is not able to swim much, because of the weight of its body.

9.47
Avoidance of Incest in Camels and Horses

Camels do not mount their mothers; even if someone forces them, they are unwilling. For once, seeing that there was not a mate, the keeper covered up the mother and put her calf to her; after mating, the cover fell off, though by then the calf had completed the intercourse; but a little later, he bit the camel-keeper to death.

631ᵃ1 It is said too that the king of the Scythians had a mare that was true to her noble stock, from whom all the colts were good. Wishing the best of these to beget offspring also from the mother, the king brought it to her in order to mate; but it was unwilling to; but when she was covered up, it mounted her in ignorance; when, after mating, the mare's face was revealed, after seeing her, the colt fled and threw itself down a cliff.[728]

9.48
The Dolphin

Among the marine animals, very many signs of mild-manneredness and tameness in the dolphin are mentioned, in particular their love and appetite for children, around Tarentum, Caria, and other places. Around Caria too, when a dolphin had been captured and wounded, a large gathering of dolphins is said to have come into the harbor until the fisherman let it go; then they all went away again together. Also, the small dolphins are always accompanied by one of the large ones for purposes of protection. Once a herd of large dolphins, together with small ones, was seen; of these, two that were left no great distance behind were seen to be swimming beneath a little dead dolphin whenever it was being carried into the depths, and buoying it up on their back, as if feeling pity for it, so that it was not devoured by some of the other beasts.

Also mentioned are some untrustworthy reports about the animal's speed; for it seems to be the fastest of all animals, both aquatic and terrestrial. Also, they leap over the masts of large ships.[729] This mostly happens to them when they are pursuing some fish for nourishment; for then, if it is escaping, they follow it down to the depths because of their hunger, and when their return to the surface becomes too long for them, they hold in their breath, as if by rational calculation, and after drawing themselves together, go off like an arrow, wishing to cover the distance by their speed in

728. Cf. 576ᵃ16–20.
729. 602ᵃ30.

order to breathe, and leap over its masts, if a ship happens to be somewhere nearby. Divers do the same thing when they have plunged to the depths; for in proportion to their own capacity they too are carried upward after drawing themselves together.

Dolphins spend their time with each other in pairs, males with females. **631ᵇ1**

One might raise a puzzle about them as to why they beach themselves on the land; for they are said to do this sometimes, when luck would have it, due to no cause.

9.49
Changes in Sexual Characteristics

Just as it happens in the case of all animals that the actions they do are in accord with their affections, so contrariwise their characters also change in accord with their actions, and often some of their parts do so too, as happens in the case of the birds. For hens, when they have defeated the males, crow in imitation of the males and try to mate them, and their crest and rump are raised, so that it is not easy to recognize that they are female; and in some even small spurs of a sort stick out.

Also, some cases have been observed of males, when the females have died, taking the female's care of the chicks, leading them around and rearing them, so that they neither still crow nor attempt to mate. There are also some birds that are so effeminate from birth that they even submit to males attempting to mate with them.

9.50
Castration and Rumination

The animals not only change, in certain cases, their shapes and character in accord with their ages and the seasons, but also when they are castrated. All animals that have testicles can be castrated. The birds and the egg-laying four-footed animals have their testicles inside near the loins; of the live-bearing terrestrial ones, most have them outside, some inside, and all at the end of the abdomen.

The birds are castrated at the rump, where they meet when mating; for if one cauterizes them there two or three times with iron, then, if the bird is already completely grown, the crest becomes pale, and it no longer crows nor tries to mate; but if it is still a young bird, neither of these affections develops as he grows.

It is the same way with human beings; for if one mutilates them as boys, the later-growing hair does not develop, nor does the voice change, but remains high-pitched; but if they have already reached puberty, the later-growing hair falls out except for that in the pubic region (this diminishes but remains), but the congenital hair does not fall out; for no eunuch becomes bald. **632ᵃ1**

The voice also changes in all four-footed animals that are castrated into that of the female. Although the other four-footed animals die, if they are not castrated when young, in the case of the boars alone, it makes no difference. But all of them, if castrated young, become larger and smoother than the uncastrated ones, but if they are already mature, they no longer grow any more.

The deer, if they are castrated when they have as yet no horns because of their age, no longer grow horns; but if they have them when one castrates them, the size of them remains the same and they do not shed them.

Calves are castrated when they are one-year-olds, otherwise they become uglier and smaller. The young bulls are castrated in the following way: laying them down and cutting the scrotum below the testicles, they squeeze them out, then they push back the roots as far as possible, and plug the wound with hair, in order that the serum flow out; and if it becomes inflamed, they cauterize the scrotum and put on a plaster. If bulls with [working] testicles are castrated, they can manifestly co-generate offspring.[730]

The ovary of female pigs is cut[731] too, so that they no longer need to be mated and instead fatten quickly. It is cut, after having starved the sow for two days, when she has been hung up by her back legs. They cut the lower part of the abdomen, about where the testicles mostly grow on the males; for there the ovary is attached to the womb; they cut off a little of it and stitch the incision together.

Female camels are cut too, when they wish to use them for war, in order that they not conceive. Some people in the uplands[732] have as many as three thousand camels. They run faster than the horses of Nesaea[733] if they run a long distance, because of the length of their stride.

In general, castrated animals grow to a greater length than uncastrated ones.

The animals that ruminate derive benefit and enjoyment from it and ruminate as
632b1 if eating. Animals that do not have two rows of teeth ruminate—for example, the cows, the sheep, and the goats. In the case of the wild animals nothing has yet been observed, except in those that are sometimes reared in captivity—for example, the deer; and this one does ruminate. All more often ruminate lying down. They ruminate most in winter, and those being nourished domestically do it for pretty much seven months; but those in herds ruminate less and for shorter periods because of feeding outside.

730. 510b3–4, *GA* 717b2–3.

731. The verb—*ektemnein*—also means "castrate," but in that sense applies only to animals that have testicles (631b21).

732. Probably inner Asia.

733. Reputedly the fastest.

Some animals with two rows of teeth ruminate too—for example, the mice from Pontus[734] and the fishes[735] (in particular, the one[736] that some call the "ruminant" after this work).

The long-legged animals are watery-boweled, while the broad-chested ones tend more to vomit, in the case of the four-legged animals, in the case of the birds, and in the case of the human beings, for the most part.

9.51
Changes in the Birds

Among the birds many change, in accord with the seasons, both their color and their voice—for example, the blackbird in place of black becomes yellow, and it has another voice; for in summer it sings, while in winter it chatters and makes a racket. The thrush also changes color; for in winter its neck parts are speckled, but in summer they become variegated; however, it does not change its voice at all.

The nightingale sings continuously for fifteen days and nights when the mountains are already covered in vegetation; after that it sings, but no longer continuously. As summer advances, it emits another voiced sound, no longer varied or rapid and flexible, but simple, and changes its color; in Italy, indeed, it is called by another name in this season. It is not seen for long; for it goes into hiding.

The redbreast and the so-called redstart both change into each other; the redbreast is a winter bird, the redstart a summer bird; they differ from each other in (one might almost say) no respect except color. It is the same way with the beccafico and the blackcap; for these too change into each other. The beccafico appears around the fruit season, the blackcap immediately after the fall. These too differ from each other in no respect except color and voice. That they are the same bird has already **633^{a}1** been observed in the case of the change in each kind of these, at the time when they have not yet completely changed and are not yet in one or other of the two forms. It is not at all strange if the voices or colors change in these cases, since even the wood pigeon does not coo in winter (except that cases have been observed where, when good weather has followed very wintry weather, it has cooed and amazed experienced people), but when spring has come, then it starts to utter voiced sounds. In general, the birds emit voiced sounds mostly and most often at the time of mating.

The cuckoo also changes its color and does not articulate its voiced sound clearly when it is about to disappear; it disappears with the Dog Star and appears again with spring until the rising of the Dog Star. The bird that some call the *oinanthê* also disappears when Sirius rises and appears as it sets; for it avoids at one time the cold and at the other time the heat.

734. $600^{b}14$.
735. Reading οἱ ἰχθύες.
736. The parrot wrasse ($508^{b}11$–12, $591^{b}22$–23, *PA* $675^{a}3$–5).

The hoopoe too changes its color and its form, as Aeschylus wrote in his poem:

> This bird, the hoopoe, which its own evils oversees,[737]
> [Zeus] has embroidered in different colors, revealing it
> As a daring bird of the rocks in full armor,
> Who, when spring appears, spreads the wing
> Of a white-feathered hawk. For thus he appears in two shapes,
> A young one's and his own, from a single womb.
> But when at new harvest the wheat is threshed,
> A dappled wing will envelop him again.
> But ever in hatred, from these to other places
> He will go, and will in deserted spots and crags reside.[738]

Some of the birds take dust baths, others water baths, and others neither dust nor water baths. All the ones that are not flyers, but stay on the ground, take dust
633b1 baths—for example, the chicken, the partridge, the francolin, the crested lark, and the pheasant. Some of the straight-taloned ones, and all the ones that spend their time near river, marshes, or sea, take water baths. Others take both dust and water baths—for example, the pigeon and the sparrow. But most of the crook-taloned ones do neither.

This, then, is the mode of these.

A special affection of certain of some of the small birds is that they release gas loudly—for example, the turtledoves. Birds of this sort make a violent movement with their fundament at the same time as the sound.

BOOK 10[739]
ON STERILITY

10.1
Causes of Sterility in Women (1)

[As their age increases,] if a man and a woman fail to generate offspring when they have intercourse with each other, the cause sometimes lies in both, sometimes in only one or the other. First, then, in the case of the female, one should observe how

737. Tereus raped Philomela, the sister of his wife, Procne. As a result, he was transformed into a hoopoe, or a hawk, to lament his own evildoings. Aeschylus combines both versions by having the old hoopoe turn into a young hawk.
738. Fr. 297 Nauck.
739. Text: L. Dean-Jones, *Aristotle: Historia Animalium Book X* (Cambridge, 2023). The status of this book is disputed. It does not belong to *HA* and may be (wholly or in part) not by Aristotle, but by a medical doctor. Its opening phrase also concludes 7.12.

matters stand concerning the uterus, in order that, if the cause lies in this, it may receive treatment, but if it does not lie in this, in order that attention may be given to one of the other two causes.

And just as with any other part, it is evident that it is healthy when it completes its own work adequately and is not pained or exhausted after doing its work—for example, an eye [is healthy] when it produces no rheum, sees, and after seeing is neither troubled nor unable to see again. In the same way, the uterus too [is healthy] if it does not cause pain, adequately completes the work that belongs to it, and after doing its work is not incapacitated but unwearied.

But it is said that even if the uterus is not in a good state, nonetheless as regards its work it may be in a good and painless state. But then its work is worse when it is in this state, just as an eye is prevented from seeing in an exact way if it is not in a good state as regards all its parts, or if there is a growth in it.

Similarly, a uterus, if it is in a good state as regards its vital place,[740] would cause no harm to its work. Indeed, the uterus that is in a good state must first not be in one place and then in another, but remain in the same position; **634^{a}1** except for coming to be further up without affection and pain, and not being too insensitive when touched. This is not difficult to discern. That the uterus should be like this is evident from the following. For if it does not come near [during intercourse], it will not be capable of drawing in [the semen]; for the place from which it must take it up will be too distant from it. But if it remains near and is not capable of going back further up, it will be less responsive, because of always being touched, so that it does not open quickly; but it must do this vigorously and easily. These then are things that must belong to the uterus, and all the uteruses to which they do not belong need some sort of treatment.

Also, the menses must occur correctly, that is, at equal times and not irregularly, when the body is healthy. For when they occur in this way it is a sign that the uterus is in the correct state to open and receive the liquid from the body when the body provides it. But when it releases it too frequently, too infrequently, or irregularly, and the rest of the body is not a contributing cause but is healthy, this must be due to the uterus. For either the uterus does not open at the opportune times because of its insensitivity, so that it receives little, or else it draws in more than it should because of some sort of inflammation in it, so that it gives a sign that it needs treatment, just as the eyes, the bladder, the stomach, and the other parts do. For all places, when they are inflamed, draw in liquid of the sort that is naturally secreted into each place, but not of the same quality or quantity [as when they are healthy]. Likewise, the uterus too, when it yields too much liquid, gives a sign of some inflammatory affection, if the liquid it yields is similar but more abundant.

If, on the other hand, the liquid is dissimilar and more putrefied than that released in healthy women, this is an already present affection and is becoming noticeable. For it is

740. *GA* $766^{a}24$.

necessary for there also to be sorts of pains to give signs that the uterus is not as it should be. In healthy women the whites[741] are released putrefied too, in some when the menses are starting, but in most when they are abating. Those, then, in whom the menses occur more putrefied than in healthy women, or are disordered, are more in need of treatment, since these are impediments to the bearing of offspring. But those in whom the times alone are anomalous and not equal, the affection is less preventive; nonetheless, it gives a clear sign that the state of the uterus is in movement and not always remaining the same. This affection is of a sort to be harmful to women who are naturally well-disposed for conception; nonetheless, it is not a disease, but the sort of affection that settles down even without treatment, unless she presents some other anomaly in addition.

634b1 If the menses change in regularity or in quantity when the rest of the body is not in a constant state, but is sometimes wetter and sometimes drier, the uterus is not at all the cause, but must itself follow along with the state of the body, receiving and releasing [liquid] proportionally. If, on the other hand, it does this while the body is healthy but changing, the uterus itself needs no treatment. But if during an illness [of the body], the uterus either yields too little residue (because the latter is being expended in some other direction where the body is sick), or emits too much (because the body is emptying itself here), this too is not a sign that the uterus itself needs treatment but that the body does. Thus, in women whose menses change together with the states of the body, it is clear that no cause lies in the uterus, since it remains healthy. These women are sometimes weaker, sometimes stronger, sometimes wetter, sometimes drier [than normal]. And the menses in these are more abundant when their body is more bulky, less when it is less so; and if it is wet, the menses are more watery, and if it is dry, more bloody.

The menses start from milk-like whites, which remain odorless; then they turn red, though they are whiter when ceasing. These whites have an odor, not of putrefaction, but more acrid and heavier, but not of pus either. Also, they occur without wasting [of the body],[742] yet along with heating, when the signs[743] occur in this way.

In those women in whom the menses occur in this way, then, matters concerning the uterus are as they should be for the bearing of offspring.

10.2
Causes of Sterility in Women (2)

One must first investigate the menses, to see if they are in the correct state, and after that see how things stand with the mouth of the uterus.[744] For it must be straight; otherwise, the uterus will not draw the seed into itself. For it is in fact into the place in front of the uterus that the woman emits, as is clear when they have wet dreams

741. 581b2.
742. *GA* 738a30–33.
743. I.e., the whites.
744. 510b14–15. I.e., the cervix.

that are complete;[745] for then this place requires treatment by them, since it has become wet, as if during sexual intercourse with a man, because emission on the part of the man is into the same place and not into the interior of the uterus.[746] But when they emit there, it is from there that the uterus draws in the seed with the aid of the breath, like the nose.[747] That is why in fact women become pregnant after intercourse in any position, because in every position, when the uterus is in the correct state, the emission of seed both by them and by the men occurs at the front of it. If it[748] were into it, they would not conceive after intercourse in every position. But if the uterus does not look straight in front of it, but toward the hips, loins, or lower abdomen, it is impossible to conceive due to the cause just mentioned,[749] because it would not be able to take up the seed. If it is fixedly in the latter state either by nature or due to disease, the affection is incurable. But if there is a rupture, either by nature or due to a disease that causes contraction due to inflammation, the affection is one or the other way for the woman.[750]

In those women who are going to be pregnant, the mouth of the uterus must, as was said,[751] be straight and in addition must open correctly. (By "correctly" I mean in such a way that when the menses start, the mouth will be softer to touch than previously and not manifestly dilated.) But if it is in this state, the first signs must be the whites. When the signs are more fleshy in color, it will be evident that the uterus has opened without pain, even if one touches it, and that there is neither unresponsiveness nor any unusual alteration of it. When the menses have ceased, the mouth must be very dilated and dry, though not hard, for a whole day and a half or even two days, which is precisely the state of a healthy mouth. For this, by happening in this way, gives a sign that the uterus is in the correct state and is doing its own work, with its mouth not opening immediately but becoming soft, because the uterus is relaxing at the same time as the rest of the body, not impeding [the menses], emitting first what comes from the mouth itself, and, [only] when the body emits more, opening up. When the signs [of the menses] have ceased, by not closing immediately the uterus gives a sign, if it is looking forward,[752] that it is becoming empty, dry, and thirsty, and that there is nothing left around the passage.

The uterus, then, that has the capacity to draw [the seed] to itself gives a sign that it is in the correct state to conceive after having sex, when it is in this state without pain or insensitivity. And to have no alteration of the mouth is good; for this gives a sign that there is nothing to prevent the uterus from closing up when it should.

745. *GA* 739^{a}20–23.
746. *GA* 739^{a}35–^{b}2; cf. 739^{b}9–20.
747. 637^{a}15–21.
748. I.e., female emission.
749. 634^{b}28.
750. I.e., is incurable if by nature, curable if due to inflammation.
751. 634^{b}26–27.
752. The meaning of ἂν ἀπορήσῃ is somewhat uncertain.

10.3
Causes of Sterility in Women (3)

As regards the mouth of the uterus, then, these are the considerations on which the investigation of whether it is or is not as it should be must be based. But as regards the uterus itself, the following sorts of thing should happen after the purgation [of the menses]. First, the woman in her sleep, when she supposes she is having intercourse with a man, she should actually emit easily, as if she were having sex. If it is evident that this happens often, it is better. Also, when she gets up, she should sometimes need treatment of the sort needed when she has had sex with a man, and sometimes she should be dry. This dryness, though, should not continue; but later, after waking, she should become wet, sometimes sooner, sometimes later, even up to half a day, when the day is short.[753] And the wetness must be of the **635b1** sort that occurs when she has had sex with a man. For all these are signs that the uterus is receptive of what is being given, and that the cotyledons have the capacity to draw toward themselves and to be retentive of what they receive, and unwilling to release it.

Further, outbursts of wind should develop in the uterus without affections, as in the stomach, and be released, whether they become large or are small, without disease; for this makes clear that the uterus is no firmer than it should be, nor insensitive either by nature or due to disease, but capable, in keeping with what it receives, of providing room for what grows. In fact, it has elasticity. When this release does not occur, the uterus is either too dense or too insensitive either by nature or due to disease. That is also why it is incapable of nourishing fetuses, but even destroys them. If these states are serious, it will do so when they are still small; if less serious, when they are larger; but if they are altogether mild, it gives birth to inferior offspring, as if nourished in an inferior container.

Further, to the touch, its right and its left parts should be even and its other parts likewise. And during intercourse with a man, it should become wet to an intermediate degree—not often and not exceedingly. This affection is a sort of local sweating, like the saliva that is often produced in the mouth both at the approach of food and when we talk and work too much. And our eyes shed tears when we look at things that are too bright, or due to cold or stronger heat, which these parts master when they can get into a wetter condition. Similarly, the uterus too becomes wet while working, when it can get into a wetter condition. Even a uterus that is most correctly constituted by nature is subject to this affection. That is why women always need treatment, more or less, just as the mouth does from spit. But in some women so much wetness occurs that they are unable to draw up the man's and the woman's emission in a pure state because of its mixing together with the liquid coming from the woman.

753. As in winter.

In addition to these affections, one should observe this much, what happens when a woman believes she has had sex with a man during sleep: what state she is in when she wakes up—for example, whether she is weaker, and if so, always, or sometimes and sometimes not, or sometimes even stronger; and whether she is not drier at first and then becomes wet. For these things should happen in a fertile woman. For the [subsequent] exhaustion[754] is always a sign that the body is emitting seed, and causes the one producing it to become weak; and when it is more corporeal, she becomes weaker. But the fact that they are subject to this without being ill is a sign that this emission is in accord with nature and in the way it should; for otherwise, the weakness would be morbid. And the fact that a woman sometimes even grows stronger, and the uterus is dry, is a sign that the entire body, and that not the uterus alone, is **636^{a}1** receiving [the seed] and hiding it, and that the body is growing strong [from this]. For it is with the aid of breath that the uterus draws in what comes to it from outside, as was said previously.[755] For the woman emits [her seed] not into [the uterus] itself but where the man also does. And everything that is done with the aid of breath is done with strength. So it is clear that the body too[756] of this sort of woman has the capacity to draw to itself.

There are some women who are subject to the sort of affection they call a "wind-pregnancy": they should not, of course, be subject to this affection. The affection is of the following sort. When they have had intercourse with a man, they neither clearly emit seed nor become pregnant, which is why in fact it is called a "wind-pregnancy." The cause of the affection is the uterus, when it is too dry; for having drawn the liquid to itself, it does not emit it outside; instead, the liquid dries up, and when it has become a small thing, it falls out of the uterus, and when it comes out it is unnoticed because of its smallness. When the uterus is very affected in this way and has become excessively dry, it jettisons it quickly, and it soon becomes clear that the woman is not pregnant. But if it does not do this very quickly, she seems in the meantime to be pregnant until it jettisons whatever it is holding in itself. And affections quickly occur in these women that are like affections in correct pregnancies, and if much time passes, the uterus becomes so swollen that the woman seems to be visibly pregnant, until it falls out. Then it becomes like it was before. They attribute this affection to the daimonic. But it is treatable, unless the woman is by nature such as to be very subject to the affection. It is a sign that women are like this if they appear not to emit [the seed] when they have received it from the man and do not become pregnant.

754. 636^{b}28.
755. 634^{b}33–35.
756. I.e., as well as the uterus.

10.4
Causes of Sterility in Women (4)

The uterus is also impeded if it has spasm. Spasms develop in the uterus either when the uterus is being distended by inflammation, or when during childbirth a large quantity of what fills it has suddenly pressed down and the mouth does not open; then, due to the distension, spasm occurs. A sign of its not having spasm is if the uterus is seen not to become inflamed in its works; for if it had spasm, it would be inflamed at that time.

Further, if there is a growth on the mouth [of the uterus] or the mouth is much ulcerated, this impedes conception. It is a sign that it does not have these things if the uterus is seen to open and close in the right way when the menses occur or there is intimacy with a man.

Further, it is the case for some women that the mouth is somehow grown together, in some from birth, in others due to disease. This occurs both curably and incurably. It is not difficult to recognize this, if it is present; for the uterus can neither receive nor emit what it should. If, then, it is seen both to receive from the man and to emit, it is clear that it is not subject to the affection.

Women in whom none of these things is an impediment, but are in the state we said they should be in, if it is not the case that the man is the cause of their childlessness, or that both are capable of producing children but cannot keep even with each other in emitting at the same time but are very discordant—these women will have children. In order to know if the causes [of sterility] lie on the man's side, though there are various signs to get hold of, it would especially be evident more easily if he has sex with other women and generates offspring.

And by not keeping pace with each other [in emitting], even when all the conditions mentioned[757] have been met, they do not generate; for it is clear that this alone is the cause. For if indeed the woman also contributes to the seed and the generation, it is clear that there must be an equal pace kept on both sides. If, then, the man has produced it quickly while the woman has scarcely done so at all (for in most things women are slower), this is an impediment. That is also why, when coupled, they do not generate offspring with each other, although they do generate when they meet with those who keep an equal pace as regards intercourse. For if the woman is excited, prepared, and has the appropriate thoughts, while the man was distressed beforehand and has cooled down, then it is necessary for them to find an equal pace with each other.

10.5
Causes of Sterility in Men

Further, it sometimes happens both to women who have had wet dreams and men who have had sexual intercourse that they are more vigorous, not in strength but

757. 10.1–4.

in health. This occurs when a large quantity of seed has gathered in the place from which it is emitted. If it departs at that time, then, the women are not weakened at all; for they are not always exhausted when it has departed, when what remains behind is sufficient, nor would they be if what has departed is useless. At the same time, they are more at ease, as being set free from overfullness.[758] That is why they become more vigorous, not through strength but through lightness. But when the emission comes out of the amount the body needs, then it makes them weaker. But it soon ceases to do so if the woman is otherwise healthy in body and at an age that produces seed quickly; for seed is among the things that quickly increase and that are capable of increase.[759] And it is especially then that they do not notice that they have become pregnant. For they do not think they have conceived if they do not perceive that they are emitting, though they are in fact emitting, supposing that the emissions from both partners should occur at the same time, both from the woman and from the man.

It is most unnoticed, though, in those women who think that it is impossible to conceive unless they have become dry and what they have been given [by the man] has noticeably been absorbed. But it happens sometimes that both she and the man emit more than she can absorb and is enough [for conception]. When, then, the uterus has drawn in enough, but a great quantity has been left behind, then they do not notice that they have become pregnant. The fact that this sort of thing can happen and that the affection[760] does not come about from all [the seed emitted] is made clear by those animals that generate several offspring from one mating, and by the generation of twins, when they come from one [mating]. For it is clear that one offspring does not come about from all the seed, but that a particular place received a particular part of it, and that what was left behind was a multiple of it.

Further, if several offspring come to be from one mating, which is precisely what is seen to occur in the case of pigs and sometimes in the case of [human] twins, it is clear that the seed comes from all of the body, but was divided into parts in the case of each form;[761] for it is possible for some to be separated off from all, and for all to be separated into many. And so it is impossible at the same time for it to be separated off part by part.

Further, the woman emits into the place in front of the mouth of the uterus, where the man emits too, when she has sex.[762] For from there she draws the seed in with the aid of the breath, just as in the case of the mouth or the nostrils. For everything that is drawn toward something not with the aid of instruments is either of a nature to be drawn upward or else, being light, is drawn from that place with the

758. *GA* 725^{a}3–11, ^{b}5–18.
759. I.e., they do not reach a natural limit of growth or increase and then stop.
760. Pregnancy.
761. Since in identical twins or offspring both the overall form and its parts (the eyes, the nose, and so on) are identical.
762. *HA* 750^{b}34–751^{a}1.

aid of breath. That is why they take care that this place become as dry as it was before emission took place. The route through which the seed goes is naturally constituted as follows in women. They have a tube, just as men also have a sex organ, but within the body. They let out breath through this via a small duct[763] that is placed higher than the one through which women urinate. And that is why, when they are sexually excited, this place[764] is not in the same state as before the excitement. It is from this tube that emission occurs, and the place in front of the uterus is much larger than the part through which the emission falls into that place. This part is, in this respect, like the nose; for the nose too has inside a duct to the larynx and to the outside air. In the same way, that tube has on the outside a small duct that is very small and narrow, just large enough to let the breath out, while the one to the place in front of the uterus is roomy and wide, just as the nose has the duct to the air larger than the one to the mouth and larynx. Similarly, women have the duct to the front of the uterus larger and roomier than the one to the outside.[765]

What is contributed into this[766] [by the woman] produces the same affections,[767] because the woman too emits a fertile seed. And so it follows that these[768] are the same [sorts of] causes. For to those people to whom [the woman's contribution] also seems to be the cause of something else, either disease or death, are not getting a theoretical grasp on the last thing, as far as regards the starting-points, which is what they must see. For in some cases all the causes are the same, in some none are, and in others some are and some are not. They produce effects, then, that are also in proportion. And so in some cases [the woman and the man] go through all the same affections; in others, in which many causes are the same, they go through many; in others they go through few; and in others, in which no causes are the same, they go though none.

10.6
Female Seed; Wind-Eggs

[Female] animals make it evident when they need to be mated. For they pursue the males—for example, the hens pursue and crouch under the male themselves, if he is not excited. Other animals do this too. If, then, the same affections are evident in all animals as regards sexual intercourse, it is clear that the same causes are occurring. But the female bird, at any rate, has an appetite not only to receive something, but also to emit something. There is a sign of this; for if a male is not present, she throws

763. Apparently thought to be in the nose-like clitoral hood.
764. The clitoral glans.
765. Omitting the subtitle.
766. I.e., the mixture in the place in front of the uterus.
767. Rejecting the addition of τὸ αἴτιον.
768. The woman's and the man's contributions.

herself down under another female, becomes pregnant, and lays wind-eggs, since she has an appetite to emit then too, in the way she emits when she in fact has intercourse with the male. Other animals do this too: for a woman once put to the test some female singing crickets she was rearing, having caught them while they were still young, and [when they had grown], they became pregnant spontaneously. From these cases, then, it is clear that every female contributes to the seed—at any rate, if in fact this is seen to occur in the case of one kind [of animal]. For there is no difference between the wind-egg and that [spontaneous] one, except that the wind-egg does not generate an animal. And this is because it does not come from both parents. That is why it is also evident that the male contributions are not all fertile, but some are infertile, when what comes from both is not harmonized as it should be.

Further, women have wet dreams and are subject to the same affections after the wet dreams as when they have had intercourse with a man: relaxation and incapacity.[769] Therefore, if it is clear that they visibly emit during wet dreams, they also contribute at that [other] time, because after wet dreams it is the same place that becomes wet and they need to give themselves the same treatment as when they have had intercourse with a man. So it is evident that emission of seed must occur from both partners if it is to be fertile.

Women do not emit into the uterus itself, but outside, where the man too emits; then from there it draws it into itself. Among females, though, some generate from themselves, as female birds do wind-eggs, while others generate nothing—for example, horses and sheep. Is this because the female bird emits into the uterus, and there is no place outside into which either she or the male emits? That is why, if he does not succeed in mating, [his seed] spills on the ground. But in the four-footed animals there is another place outside into which both the female and the male emit.

The precise thing that in the other animals is mixed with other liquids and is not composed in the uterus because it does not enter it, this is what, in the birds, the uterus receives, concocts, and turns into a sort of body, which in other respects is like an animate being, but is not one, because an animate being must come from both partners. **638^{a}1**

10.7
Molar Pregnancies

But there is a possible objection as to whether women are telling the truth when they say that when they have a wet dream, they wake up dry. For it is clear that the uterus draws in [the seed] upward; so, then, why is it that females themselves do not generate by themselves, if indeed they in fact draw up the male seed when it is mixed

769. 635^{b}31–41.

with theirs? Why do they not also draw up their own seed unmixed, when it reaches the place outside?

In women who have been pregnant for many years the following affection occurs. They give birth to what they call a "mole,"[770] as happened to a certain woman. When she had had intercourse with a man and believed she had conceived, her uterus grew in bulk and at first everything else occurred as expected. But when the time came for giving birth, she neither gave birth nor did the bulk become less; instead, she continued in that state for three or four years, until having contracted dysentery and become dangerously ill, she gave birth to a good-sized mass of flesh, which they call a "mole." In some women, the affection even persists until they grow old and die.

Or is this affection due to heat, when the uterus happens to be hot and dry, and because of this is capable of drawing [the female seed] into itself in such a way that it is able to take it up and keep it in itself? For when the uterus is in this state, if there is no mixture of seed from both partners and it instead receives seed from one of the two, as in the case of the wind-egg, then a so-called mole occurs, which is neither an animal, because it has not come from both, nor inanimate, because what was received was animate,[771] like the wind-eggs. And the mole remains within for a long time because of the state of the uterus and because the case of the bird is different: it lays many eggs internally, when the uterus is distended by them, they are pushed forward and laid, and once the uterus is opened, even the last egg comes out. For there is nothing to impede them, but in fact the body, having a tendency to emit at the time it has been filled up, can no longer make the uterus retractive. But in the case of all the live-bearing animals—because, as the fetus is growing, its capacity changes and it needs distinct nourishment at distinct times—the uterus, when it becomes somewhat inflamed, causes its birth at the right time. But the mass of flesh, because it is not an animal, is alike at all times. For what burdens the uterus need do nothing to make it inflamed. Thus in some women, at any rate, the affection persists even until death, unless as the result of some lucky ailment, as in the case of the woman seized by dysentery.

638[b]1 But does the affection occur because of heat, as was said,[772] or is it rather because of liquid,[773] when the uterus is not so cold as to emit it nor so hot as to concoct it? And that is why the affection lasts a long time, just as things remain boiling for a long time. But boiled things have a limit to their thickening. But uteruses of this sort, being the most extreme cases, make the time long. Further, since the mass of flesh is not an animal, because it is not moving, it does not produce the pain of labor; for the movement of the ligaments is labor, which, because the fetus is alive, expels the

770. *GA* 4.7.

771. I.e., it has nutritive but not perceptual soul. See *GA* 741[a]18–30, 757[b]16.

772. 638[a]18.

773. Secluding ὅτι καὶ ἔστι τὸ πλήρωμα οἷον μύει ("because it is in fact the fullness that closes the mouth").

fetus. Also, the hardness of the thing that occurs is a product of parboiling.[774] For it becomes so hard that they cannot cut it with an axe. But some things that have been boiled and all things that have been concocted become soft, but things that are parboiled are unconcocted and hard.

Many doctors, being ignorant of this, say that the affection is moles due to a similarity, if they have merely seen the stomachs swelling up, without edema, and the cessation of the menses, when the affection is prolonged. But it is not; for moles occur rarely. Sometimes a confluence occurs of cold, wet, and watery residues, sometimes of more solid ones, into the place around the stomach, if the women are of this sort in nature or in state. For these produce neither pain nor heat, because of their coldness. And as they increase, some to a greater extent, others to a lesser one, they bring on no other ailment beyond themselves, but rather, like some deformity, remain quiet. The cessation of the menses occurs due to the fact that the residues are used up here, just as when the women are suckling; for in these too the menses either do not occur or occur in small quantities. Sometimes too a confluence from the flesh into the place between the uterus and the stomach seems to be a mole, though it is not.

It is not difficult to recognize if there is a mole by touching the uterus. For if the uterus is compact and has not increased in size, it is clear that the affection is not in it. But if it is like when it contains a child, it has a mole. It will be both hot and dry, because the liquids have been diverted inward, and, as for its mouth, it will be as it is when women are pregnant. But if the mass is something else, the uterus will be cold to the touch and not dry, and the mouth will be as it always is.

774. *Mete*. 381^{a}12–22.

ON THE PARTS OF ANIMALS*

BOOK 1

1.1
The Method of Inquiry of Natural Science (1)

Regarding every sort of theoretical investigation and every methodical inquiry, the more humble and more estimable alike, there appear to be two ways for the state to **639a1** be, one that may be well described as scientific knowledge of the subject matter, the other a certain sort of educatedness. For it is characteristic of a well-educated person to be able to judge accurately what is well said and what is not by the speaker. For we 5 consider someone who is well educated about the whole of things to be a person of this sort, and we think that being well educated consists in having the capacity to do what was just stated. Except that in one case, we consider a single individual to have the capacity to judge about (one might almost say) all things, in the other case, about a definite nature; for there might be another person with the same capacity as the one 10 we have been discussing but about a part. So it is clear in the case of inquiry about nature too that there must be certain defining marks by reference to which we can appraise the way of proving things, separately from the question of what the truth is, whether thus or otherwise.

I mean, for example, must one take each substance singly and, where it is con- 15 cerned, define it by itself (for example, where the nature of a human is concerned, or of a lion, or in fact of any other sort of animal, discussing it by itself), or must one posit, in accord with something common, the affections common to all? For many of the same things belong to many sorts of animals that are distinct from each other— for example, sleep, respiration, growth, withering, death, and in addition any remain- 20 ing affections and dispositions of this sort; for at the moment it is possible [only] to speak unclearly and indefinitely about them. But it is evident, especially in speaking with respect to a part, that we will repeatedly say the same things about many kinds; for even to horses, dogs, and human beings each of the ones just mentioned belongs. 25 So if one speaks of the affections with respect to a particular sort, it will be necessary to speak repeatedly about the same ones, whenever the same ones belong to different forms of animals, while they themselves exhibit no difference.

* Translated by C. D. C. Reeve. Text: P. Louis, *Les Parties des Animaux* (Paris, 1957), in consultation with J. Lennox, *On the Parts of Animals* (Oxford, 2001).

But presumably there are other affections that are designated by the same predicate, but differ due to a difference in the form—for example, the progression of animals; for it is evident that it is not one in form; for flying, swimming, walking, and crawling differ. That is why the way one must investigate should not be overlooked—I mean whether one must observe what is common with respect to kind first, and then later the special affections, or [what is common] with respect to the particular [form] from the outset. For as things stand this has not been determined, nor indeed has what will now be stated, whether just as the mathematicians prove the things that astronomy is concerned with, so in that way too the natural scientist, having first observed the things that appear to be so concerning the animals and the parts of each, must then state the why, that is, the cause, or else proceed in some other way.

In addition to this, since we see several causes where natural coming to be is concerned—for example, both the for-the-sake-of-which and the one from which comes the starting-point of movement, it must be determined also about these, which sort is naturally first, which second. It is evident that first is the one we call a for-the-sake-of-which; for this is an account, and the account is a starting-point alike both in the things composed in accord with craft and in those composed by nature. For once the doctor has defined health and the builder has defined a house, whether by thought or by perception, they give the accounts and the causes of each of the things they produce, and why they must be produced in this way. Yet the for-the-sake-of-which and the good are present more in the works of nature than in those of craft.

But though what is of necessity is not present in all the things that are in accord with nature in the same way, pretty much everyone tries to bring their accounts back to it, without having distinguished in how many ways things are said to be necessary. But what is unconditionally necessary is present in the eternal things, while what is hypothetically necessary is also present in all things that come to be, as it is in the products of craft—for example, a house or anything else of this sort. It is necessary, though, that a certain sort of matter be present if there is to be a house or any other sort of end, and this must come to be and be changed first, then that, and so on continuously up to the end and the thing for the sake of which a given thing comes to be and is. And it is the same way too in things that come to be by nature.

But the mode of demonstration and of necessity is distinct in the case of the natural and the theoretical sciences. (These have been spoken about elsewhere.[1]) For the starting-point in the latter is what is, and in the former, what will be—for example, "since health or the human is such-and-such sort of thing, it is necessary for *this* to be or come to be"; but not, "since *this* is or has come to be, *that* of necessity is or will be." Nor is it possible to link eternally the necessity of this sort of demonstration so as to say, "since *this* is, [it is necessary] that *that* is." (About these things too

1. *Ph.* 2.9, *Met.* 5.5, 6.1.

determinations have been made elsewhere:[2] what sorts of things necessity is present in, what sorts [necessity] converts in, and due to what cause.)

But neither must we forget to ask whether it is fitting to state, as those who earlier made a theoretical investigation did, in what way each thing has naturally come to be rather than in what way it is. For the one differs in no small way from the other. It seems that one must begin from what we said previously,[3] that first one must grasp the things that appear to be so about each kind, then state their causes, and then speak about their coming to be; for, in building too these things happen because the form of a house is such-and-such sort of thing rather than the house being such-and-such sort of thing because it comes to be in this way. For coming to be is for the sake of the substance, not the substance for the sake of coming to be.

That is why Empedocles did not speak correctly when he said[4] that many things are present in animals because of the way things happened during the coming to be—for example, that the spinal column is such as it is because it happened to be broken when the animal was bent [in the uterus]. He ignores, first, that the seed that composes it must be present having this sort of capacity, and, second, that its producer must be present prior to it, not only in account but also in time; for it is the human being that generates a human being. So it is because of *that* first one's being such-and-such sort of thing that the coming to be is of such-and-such sort for *this* second one. It is likewise in the case of things that seem to come to be spontaneously as in the case of products of craft; for in some cases things that come to be spontaneously also do so due to craft—for example, health. In the case of the products of craft, of course, something similar to them that is capable of producing them preexists—for example, the craft of sculpting; for a statue does not come to be spontaneously. And the craft is the account of the work that is without the matter. And it is likewise with the things that are due to luck;[5] for as the craft has it, so they come to be.

That is why one must most of all say that since this is the essence of a human, because of this it has these things; for it is not possible for it to be without these parts. Otherwise, one must say the closest thing to it, either in general that it is impossible to be another way or that it is good to be this way. And these things follow. And since it is of this sort, it is necessary for its coming to be to happen in this way and be of this sort. That is why of the parts *this* one comes to be first, then *that* one.[6] And [one must proceed] in this way, then, likewise in the case of all the things composed by nature.

Now, the ancients who first philosophized about nature investigated the material starting-point and this sort of cause, what it is, what sort of thing it is, how the whole comes to be from it, what moves it (for example, strife, love, understanding, or chance), and what sort of nature the underlying matter has of necessity (for example,

2. *APo*. $95^{b}36$–$96^{a}8$, *GC* $337^{b}25$–$338^{a}11$.
3. $639^{b}8$–10.
4. B97 DK.
5. Reading καὶ τοῖς ἀπὸ τύχης ὁμοίως.
6. *GA* $743^{b}18$–32.

that of fire hot, of earth cold, and that of fire light, that of earth heavy). For in this way too they generate the cosmos. And they speak in a similar way about the coming to be both of plants and of animals—for example, saying that as water flowed into the body a stomach and every part that receives nourishment and residue came to be, and that as the breath was passing through the nostrils were torn open.

And air and water are matter for the bodies; for it is from these sorts of bodies that all of them compose the nature. But if human beings, animals, and their parts exist by nature, one must speak about flesh, bone, blood, and all of the uniform parts. Similarly, in the case of the non-uniform parts (for example, face, hand, foot), one must say in virtue of what each of them is the sort of thing it is, and with respect to what sort of capacity. For it is not enough to say what things they are composed of (for example, of fire or earth); [instead,] just as if we were speaking about a bed or anything else of this sort, we must try to define the form of it rather than the matter (for example, the bronze or the wood). But if not, then, at any rate, the matter of the compound; for a bed is a *this in this* or a *this such-and-such sort of thing*, so that one must speak of its configuration as well, and what its visible form is. For nature in accord with shape [or form] is more strictly [nature] than material nature is.

If it is by its configuration and by its color that each of the animals and its parts is what it is, Democritus might be speaking correctly; for he appears to suppose this. At any rate, he says that it is clear to everyone what sort of thing a human is with reference to its shape, on the supposition that it is known by its configuration and color. And yet though the configuration of a corpse has the same shape, nonetheless it is not a human. Further, it is impossible for something in any and every condition (for example, made of bronze or wood) to be a hand, except homonymously, like a doctor in a drawing. For such a hand will not be capable of doing its work, any more than either stone pipes or a doctor in a drawing. Similarly, none of the parts of a corpse is any longer the sort of thing it is—I mean, for example, an eye or a hand.

Democritus, then, has spoken in too simple a way, and in the same way as a carpenter might speak of a wooden hand. This is also the way, indeed, that the natural scientists speak of the processes of coming to be and the causes of configuration (for [ask them] from what capacities things are crafted, and perhaps the carpenter says an axe or an auger, while the natural scientists say air or earth), except that what the carpenter says is better; in fact, it will not be enough for him to say just this much, that when his instrument fell, in one case a hollow was produced, in another a plane surface; instead, by saying why he struck the blow in this way, and for the sake of what (in order that such-and-such sort, or such-and-such other sort, of shape might be produced), he will state the cause.

It is clear, therefore, that the natural scientists do not speak correctly, and that one must state that the animal is of *this* sort, and where each of its parts are concerned, say what it is and what sort of thing it is, just as where the form of the bed is concerned. If, then, this thing is soul, a part of soul, or not without soul (when the soul has departed, at least, there is no longer an animal, nor do any of the parts

remain the same, except in configuration, like the mythological ones that are turned to stone)—if these things are so, then it will belong to the natural scientist to speak and know about the soul (and if not about all of it, about this part by itself in virtue of which the animal is the sort of thing it is), that is, what the soul (or this part by itself) is, and about the coincidental affections it has in virtue of the sort of substance it has, especially as a thing's nature is said of it in two ways and *is* in two ways, one as matter, the other as substance. And nature as substance is nature both as the mover and as the end. And this sort of thing in the case of the animal is the soul, either all of it or some part of it. So in this way too the person getting a theoretical grasp on nature must speak about the soul more than about the matter, inasmuch as it is more the case that the matter is nature because of the soul than the reverse. For even the wood is a bed or a tripod because it is these things potentially.

Someone might raise a puzzle, in view of what was said just now, as to whether it belongs to natural science to speak about all soul, or about a certain part of it. For if it is about all of it, beyond natural science there is no philosophy left. For understanding is of the intelligible objects. So natural science would be knowledge of all things; for it belongs to the same science to get a theoretical grasp on understanding and on **$641^{b}1$** the intelligible objects, if indeed they are in relation to each other and the theoretical knowledge of things that are in relation to each other is in all cases the same, just as is also the case with perception and perceptible objects. Not all soul, however, is a starting-point of movement, nor are all its parts; rather, of growth it is precisely the part that is also present in plants, of alteration it is the perceptual part, and of spatial movement some other part, and not the one capable of understanding; for spatial movement is present in other animals too, but thought in none. So it is clear that [the natural scientist] must not speak about all soul; for not all soul is a nature, although some part of it—whether one part or several—is.

Further, of the results of abstraction none is an object of theoretical natural science, since nature does everything for the sake of something. For it is evident that, just as the craft is present in the products of craft,[7] so in the things themselves there is a certain other starting-point and cause of this sort, which we have, like the hot and the cold, from the universe. That is why it is more likely that the heaven came to be from a cause of this sort, if it came to be, and is due to a cause of this sort, than the mortal animals. At any rate, what is ordered and what is definite are much more evident in the heavens than around us, while what is variable and as it chanced to be are much more so around what is mortal. Some people, however, say that each of the animals is and came to be by nature, while the heaven, in which no chance or disorder whatever is evident, was composed in that way by luck and chance.[8]

We say "this is for the sake of that" wherever there appears to be some end toward which the movement proceeds if nothing impedes it. So it is evident that there is

7. *Met.* $1070^{b}33$.
8. *Ph.* $196^{a}25$–$^{b}5$.

something of this sort, which is precisely we call a "nature." For surely it is not some random thing that comes to be from each seed, but rather *this* one from *that* one, or a random seed from a random body. Therefore, the seed is a starting-point and is productive of what comes from it. For these things are by nature; certainly, they grow from seed. But surely prior again to it is what the seed is a seed of; for while the seed is [of something] coming to be, the end is the substance. And prior again to both of these is what the seed is from. For the seed is twofold, *from* which and *of* which; for it is a seed both of what it came from (for example, from a horse) and of what will be from it (for example, a mule), although not in the same way, but of each in the way just mentioned. Further, the seed is potentially [something]; and we know how potentiality is related to actuality.

642ᵃ1 There are, therefore, these two causes, the for-the-sake-of-which and the of-necessity. And many things come to be because of necessity. But perhaps someone might be puzzled as to what sort of necessity those who say things are of necessity are speaking about; for of two of the modes distinguished in the studies in philosophy[9] neither can apply. The third, though, does apply, at any rate, to the things that have a coming to be; for we say that nourishment is something that is necessary in accord with neither of these two modes, but because it is not possible to exist without it. But this is so as something hypothetically necessary; for just as since the axe must split things, it is necessary for it to be hard, and if hard, then made of bronze or iron, so too since the body is an instrument (for each of the parts is for the sake of something, and similarly the whole is too), it is therefore necessary for it to be of such-and-such a sort and composed of things of such-and-such sorts, if that is to be so.

It is clear, then, that there are two modes of cause, and that as far as possible one must succeed in stating both, but if not, at any rate, try to do so,[10] and that all those who do not state (one might almost say) nothing about nature; for the nature is more a starting-point than the matter is. Even Empedocles stumbled onto this, led by the truth itself, and is compelled to say that the substance and the nature is the ratio—for example, when he says what bone is;[11] for he does not say that it is some one of the elements, or two, three, or all of them, but rather that it is the ratio of their mixture. It is clear, therefore, that flesh too is the same way, as well as each of the other parts of this sort.

The cause of our predecessors not arriving at this mode is that there was then no essence and defining of the substance. But Democritus touched on this first, not as something necessary to the theoretical investigation of nature, but because he was carried away by the facts. In the time of Socrates, however, [interest in] it grew, but inquiry concerning natural things abated, and philosophers turned instead to useful virtue and political science.

9. *APo*. 94ᵇ36–95ᵃ9, *Met*. 1015ᵃ20–36.
10. Reading εἰ δὲ μή, γε πειρᾶσθαι ποιεῖν, δῆλον.
11. B96, B98 DK, *Met*. 993ᵃ15–18.

One must prove things in the following way, for example, that respiration is for the sake of *this*, while *that* comes to be of necessity because of *these* things. But necessity sometimes signifies "if *that*—the for-the-sake-of-which—is to be, it is necessary for these things to hold," while at other times it signifies that things hold that way by their very nature. For it is necessary for the hot to go out and come in again on meeting resistance, and for the air to flow in. This is immediately necessary. And the beating back of the internal heat in the cooling of the external air is inhalation. **$642^{b}1$**

This, then, is the mode of the methodical inquiry, and it is concerning these, and things of this sort, that one must grasp the causes.

1.2
Dichotomous Division (1)

Some people[12] [try to] grasp the particular [form] by dividing the kind into two differences. But this is in one respect not easy, and in another, impossible. For of some things there will be only one difference, the others being superfluous—for example, footed, two-footed, split-footed; for this difference alone is a controlling one. Otherwise, it is necessary to say the same thing many times. Further, it is fitting not to tear each kind asunder—for example, the birds, putting some in one division and some in another, as we have in the diagrammed divisions;[13] for there the result is that some have been divided off with the aquatic animals, some in another kind. This similarity class, of course, has an established name, "bird," and a distinct one, "fish." Other similarity classes are nameless—for example, the blooded and the bloodless; for there is no established name for either of these. If indeed, then, none of the things that are homogeneous must be torn asunder, division into two will be pointless; for people who divide in this way necessarily separate and tear asunder; for some of the many-footed are among the terrestrial animals, others among the aquatic ones.

1.3
Dichotomous Division (2) versus Correct Division (1)

Further, it is necessary to divide by a privation, and those who dichotomize do divide by it. But there is no difference of a privation, insofar as it is a privation; for it is impossible for there to be forms of what is not (for example, of footless or wingless), as there are of winged and of footed. But there must be forms of a universal difference; for if this were not so, why would it be universal and not particular? Some differences, though, are universal and have forms—for example, winged (for one

12. Plato uses dichotomous division as a method of definition in the *Statesman* and *Sophist*.
13. A reference, presumably, to a diagram in which the bird kind is shown torn asunder.

wing is unsplit, another split). And footed is the same way, one foot has many splits, another two splits (for example, the cloven-hoofed), another has no splits and is undivided (for example, the solid-hoofed animals). It is difficult, then, to distribute the animals even into differences of this sort, of which there are forms, so that any animal whatever belongs in them and the same animal does not belong in more than one—for example, winged and wingless (for the same animal is both of these—for example, the ant, the glow worm, and certain others). But most difficult of all, or else impossible, is to distribute them into the bloodless ones.[14] For it is necessary for each of the differences to belong to one of the particulars, so that the opposing one does so too. But it is not possible for some single indivisible form of the substance to belong to animals that differ in form; instead, it will always have a difference—for example, bird differs from human being (for their two-footedness is other and different), and even if they are blooded, their blood is different, or blood must be supposed to be no part of their substance. But if this is so, one difference will belong to two [forms of] animals. And if *this* is so, it is clear that it is impossible for a privation to be a difference.

The differences will be equal in number to the indivisible [forms of] animals, on the assumption that both the [forms of] animals and the differences are indivisible, and there is no common difference. But if it is possible for one that is in fact common to be present,[15] though it is indivisible, it is clear that, in accord with the common one, at any rate, animals that are distinct in form are in the same form. So it is necessary, if the differences into which all the indivisible [forms of] animals fall are special, for none of them to be common. Otherwise, distinct [forms] will go into the same difference. But the same indivisible one must not go now into one and now into another difference in the divisions, nor must different ones go in the same one, and all should go into these.[16]

It is evident, therefore, that it is impossible to grasp the indivisible forms by dividing in the way that those people do who divide the animals, or any other kind, into two. For even according to them it is necessary for the ultimate differences to be equal to all the animals that are indivisible in form. For if there is a certain kind of which shades of white are the first differences, and of each of these there are other differences, and in this way on down to the indivisible ones, the final differences will be four, or some other quantity obtained by doubling from one, and the forms too will be that many. And the form is the difference in the matter.[17] For no part of an animal is either without matter or is matter alone; for a body in any and every condition will not be an animal, nor any of its parts, as has often been said.[18]

14. Reading εἰς τὰ ἄναιμα.
15. Reading εἰ δ' ἐνδέχεται ὑπάρχειν καὶ κοινήν.
16. I.e., their own.
17. *Met.* 1024b6–9, 1058a23–25.
18. Most recently at 641a17–21.

Further, one must divide by things in the substance and not in the intrinsic coincidents—for example, if someone were to divide the [geometrical] figures, so that some have angles equal to two right angles, others angles equal to more (for having angles equal to two right angles is for the triangle a sort of coincidental affection).

Further, one must divide by opposites. For opposites are different from each other—for example, whiteness and blackness, straightness and curvature. So if one of the two is a difference, one should divide by its opposite, and not one by swimming and the other by color.

In addition to these, animate beings, at any rate, must not be divided by the works common to the body and the soul—for example, in the divisions mentioned just now, walkers and flyers; for there are certain kinds to which both differences belong and are flyers and wingless, just like the ant kind. Also, [they must not] be divided by wild and tame; for in the same way this would seem to divide forms that are the same. For (one might almost say that) whatever is tame is also wild—for example, the human beings, the horses, the oxen, the Indian dogs, the pigs, the goats, and the sheep), since each of these, if homonymous, has not been divided separately, and if these are one in form, wild and tame cannot be differences.

In general, however, this is the necessary result of dividing any sort of [kind] whatever by a single difference. Instead, one must try to grasp the animals by kinds, in the way already shown by ordinary people, distinguishing a bird kind and a fish kind. And each of these has been defined by many differences, not by dichotomy. For by dichotomy either it is impossible to grasp them at all (for the same one falls into several divisions and contrary ones into the same division), or there will be only one difference, and this one, whether simply or the result of interweaving, will be the final form. If, on the other hand, one does not take the difference of a difference, one will necessarily make the division continuous in the same way that one makes the account one by means of conjunctions. I mean the sort of thing that results in the divisions into the wingless and the winged, and winged into the tame and the wild, or the white and the black; for neither the tame nor the pale is a difference of winged; instead, each is a starting-point of another difference, while here each is coincidental. That is why one must from the outset divide the one [kind] into many [differences], as we say. For in this way too privations will produce a difference, while by dichotomy they will not produce one.

That it is impossible to grasp the particular form by dividing the kind in two, as some people have thought,[19] is also evident from the following. For it is impossible for just one difference to belong to the divided particular [forms], whether one takes simple or interwoven ones. (I say that they are "simple" if they have no difference, for example, split-footed, and "interwoven" if they do have a difference, for example, the multi-split-footed in relation to the split-footed.) For this is what the continuity of the differences that stem from the kind in accord with the division requires, since

30 **$643^{b}1$** 5 10 15 20 25 30

19. $642^{b}5$.

the totality is one thing. But the mode of expression makes it seem that the final one alone is the [one] difference—for example, "multi-split-footed," or "split-footed"—and that "footed" and "many-footed" are superfluous.

644a1 But that it is impossible for there to be many differences of this sort is clear; for by proceeding continuously one arrives at the ultimate difference (although not at the final one that is the form). This is either split-footed alone, if one is dividing the human or the whole complex—for example, if one were to combine footed, two-footed, and split-footed. On the other hand, if the human were split-footed alone, by proceeding in this way one might arrive at this one difference. But as things stand, since this is not so, it is necessary for there to be many differences that are not under one division. Yet there cannot be *many* differences of the same thing under one dichotomous division; instead, one must end with one [difference] in accord with one [division]. So it is impossible for those who divide in two to grasp any of the particular [forms] of animals whatever.

1.4
Correct Division (2)

Someone might be puzzled as to why human beings have not called by one name embracing one kind what encompasses at the same time both the aquatic animals and the flyers. For there are some affections common both to these and to all the other animals. Nonetheless, they are correctly distinguished in this way. For whatever kinds differ by excess and by the more and the less have been yoked together under one kind, while those that are analogous, have been separated. I mean, for example, that bird differs from bird by the more or by excess (for one is long-feathered, another short-feathered), while fishes differ from birds by analogy (for what is feather in the one is scale in the other). But to do this in all cases is not easy; for most animals have the same affections by analogy.

But since it is the ultimate forms that are the substances, and these are undifferentiated with respect to form (for example, Socrates, Coriscus), it is necessary either to state the things that belong universally first, or to say the same thing many times, as has been said.[20] And universals are things that are common; for things that belong to many we say are universal. But there is a puzzle as to which of the two we should study. For insofar as a substance is what is indivisible in form, it would be best, if one could, to get a theoretical grasp separately on the things that are particular and indivisible in form, just as on human; not, however, in the same way on bird too, for this kind has forms, but rather on whichever of the indivisible [forms] of birds it is—for example, the sparrow, the crane, or something of this sort. On the other hand, insofar as it will result in speaking often about the same affection, because it

20. 639a26–29.

belongs in common to more than one [form], in this respect it is somewhat absurd and tedious to speak separately about each one.

Perhaps, then, the correct course is to speak of some affections in common with **644ᵇ1** respect to kinds, wherever the kinds are said of things by human beings in a well-defined way, and have both a single common nature and forms in them that are not too distant—[for example,] bird, fish, and any other there may be that, though nameless, encompasses in a similar way to a kind the forms within it. But wherever they are not of this sort, we should speak of the particular [form]—for example, about human being and any other there may be of this sort.

The kinds have been defined pretty much by the figures of the parts and of the whole body, when they bear a similarity—for example, as things in the kind of the birds do in relation to each other, as well as those in that of the fishes, the soft-bodied animals, and the hard-shelled animals. For the parts of these differ not by analogous similarity, as bone and spine are related in human being and fish, but rather by bodily affections—for example, large small, soft hard, smooth rough, and such—and, in general, by the more and the less.

How, then, the methodical inquiry about nature must be appraised, and in what way the theoretical investigation of these things might proceed methodically and most easily, further, where division is concerned, in what way it is possible by means of it to grasp things in a useful way, and why dichotomy is in some respects impossible and in others empty, has been stated.

Having determined these things, let us speak about what comes next, making the following a starting-point.

1.5
The Method of Inquiry of Natural Science (2)

Among the substances composed by nature, some are incapable of coming to be and incapable of passing away for all eternity, while others participate in coming to be and passing away. But it has happened that where the former are concerned, though they are estimable and divine, our theoretical investigations are less developed (for both about the things on the basis of which one would investigate them and the things about them we long to know, the things evident to perception are altogether few). But where the plants and animals that are capable of passing away are concerned, we are better equipped for knowledge because of living together with them; for many things belonging to each kind can be grasped if one wishes to take sufficient pains. Each of the two has its charms. For even if our contact with the eternal things is small, nonetheless because knowing them is the most estimable, it is more pleasant than knowing all the things around us, just as a random small glimpse of the ones we love is a greater pleasure than seeing many other great things in exact detail. But because of knowing the others more and in greater number they take preeminence **645ª1**

in scientific knowledge. Further, because they are nearer to us and more of our own nature, they provide some compensation in comparison to the philosophy concerned with divine things. But since we went through them by stating what seems to be so to us,[21] it remains to speak about animal nature, if possible, omitting nothing whether less estimable or more estimable.

For even in the theoretical investigation of animals disagreeable to perception, the nature that crafts them nonetheless provides enormous pleasures to those who are capable of knowing the causes and are by nature philosophers. For it would in fact be unreasonable, even absurd, if we enjoyed investigating the likenesses of animals because of at the same time investigating the craft (for example, painting or sculpture) that crafted them, while not loving even more the theoretical investigation of the ones composed by nature—at any rate, when we are capable of seeing their causes distinctly. That is why we must not be childishly disgusted at the investigation of the less estimable animals. For in all natural things there is something wondrous present—as indeed Heraclitus is said to have told those strangers who wished to meet him but stopped as they were approaching on seeing him warming himself at the oven.[22] For he told them to enter confidently, "for there are gods even here."[23] In this way too one must approach inquiry concerning each of the animals without disgust, on the supposition that in each one there is something natural and good. For what is not random but rather for the sake of something is present most of all in the works of nature, and the end for the sake of which each has been composed or has come to be has taken the place of the good.

But if someone has considered the theoretical investigation of the other animals to be without esteem, he must think the same thing about himself as well; for it is impossible to look at what the human kind is composed of—for example, blood, flesh, bones, blood vessels, and other parts of this sort—without considerable disgust. But in the same way as someone discussing the parts or the equipment of anything whatever must be considered as doing so not to produce a record concerning the matter, nor for the sake of it, but rather for the sake of the whole shape [or form] (for example, concerning the house in fact, and not bricks, mortar, and timbers), so where nature is concerned too, one must consider the discussion to be about the composition and the whole substance, but not about those things that do not occur in separation from their substance.

It is necessary, first, in relation to each kind, to divide off the coincidental affections that belong intrinsically to all the animals, and after this to try to divide off their causes. It was also said previously[24] that many things belong in common to many animals, some unconditionally (for example, feet, wings, and scales, and affections of course in the same way as these), some by analogy. I mean "by analogy" that while to

21. Presumably, in *Cael.* and in (especially) *Met.* 12.
22. Possibly, but not certainly, a euphemism for going to the lavatory.
23. 22A9 DK.
24. 639a19–22.

some a lung belongs, to others belongs not a lung, but something else instead of it, which is to them what a lung is to those that have one. And to some blood belongs, to others its analog does, having the very same capacity that blood has for the blooded ones. To speak separately about each of the particular [forms], though, as was also said before,[25] will result in saying the same things many times, whenever we speak about all the things that belong to them; and the same ones belong to many. Let these issues, then, be determined in this way.

But since every instrument is for the sake of something, and each of the parts of the body is for the sake of something, and what they are for the sake of is a sort of action, it is evident that the whole body too has been composed for the sake of a sort of total[26] action. For sawing did not come to be for the sake of the saw, but the saw for that of sawing; for sawing is a certain use. So the body too is in a way for the sake of the soul, and the parts for the sake of that among the works for which each has naturally grown. Therefore, one must speak first about the activities—the ones that are common to all, the ones that are so with respect to kind, and the ones that are so with respect to form. I mean by "common" those that belong to all animals, by "with respect to kind," those whose differences in relation to each other we see to [differ] by excess—for example, I speak of birds with respect to kind, of human with respect to form, as too of everything that in accord with its universal account has no difference at all.[27] For some have what is common by analogy, others with respect to kind, others with respect to form.

Wherever actions are for the sake of other actions, then, it is clear that the [parts] they are the actions of are distinguished in the very same way as the actions. Similarly, if some actions are in fact prior to, and the end of, other actions, it will be the same way too with each of the parts, whose actions are these sorts of actions; and, thirdly, things whose existence necessitates the presence of [other things]. By "affections" and "actions" I mean coming to be, growth, mating, waking, sleep, progression, and any other things of this sort that belong to animals. By "parts" I mean nose, eye, and the composite face, each of which is called a "member." And it is the same way too with the other parts.

And about the mode of our methodical inquiry let this much be said. We must now try to state the causes both of the common and of the special affections, starting, in the way we have determined, first with those that are first. **646^{a}1**

25. 639^{a}23–29.
26. Reading πλήρους.
27. As human kind is not further divided by a difference.

BOOK 2

2.1
The Levels of Composition of Animals

Of which and how many parts each of the animals is composed has been made more perspicuous in the inquiries about them;[28] due to what causes each has the mode of them it does must be investigated now, by taking separately and by itself the ones mentioned in the inquiries.

But since there are three compositions, one might put first the one from what some people call the "elements"—namely, earth, air, water, and fire. Still, it is perhaps better to speak of composition from the capacities, and not from absolutely all of them, but as stated previously elsewhere.[29] For wet, dry, hot, and cold are matter[30] for the composite bodies, while the other differences—for example, heaviness and lightness, density and rarity, roughness and smoothness, and the other bodily affections of this sort—follow along with these.

Second is the composition from the first ones of the nature of the uniform parts in the animals—for example, bone, flesh, and other things of this sort.

Third, and last in number, is that of the non-uniform parts—for example, face, hands, and the parts of this sort.

What holds in the case of coming to be is contrary to what holds in the case of the substance; for what is posterior in coming to be is prior in nature, and first in nature is last in coming to be; for a house is not for the sake of bricks and stones, but rather these are for the sake of the house; and the same holds as regards other matter. Not only is it evident from induction that this holds this way, but it is also in accord with reason; for everything that comes to be has its coming to be produced from something to something, that is, from a starting-point to a starting-point, from a starting-point that is the first mover and already possesses a certain nature to a certain shape or another end of this sort; for a human being generates a human being and a plant a plant, from the underlying matter of each. In time, then, it is necessary for the matter and the coming to be to be primary, but in account, it is the substance and the shape of each thing. This would be clear if one were to state the account of coming to be; for the account of house-building includes that of the house, but that of the house does not include that of house-building. And it is the same way in the case of the others too. As a result, the matter of the elements is necessary for the sake of the uniform parts. For these are posterior in coming to be to the elements, and posterior to them are the non-uniform parts; for these already possess their end and

28. Including *HA* 1.
29. *Mete*. 378b28–379b9.
30. *Met*. 1070b12–13.

limit, having received a composition of the third sort, as happens in the case of many things when their comings to be are completed.

From both these parts, then, the animals have been composed; but the uniform parts are for the sake of the non-uniform ones; for of the latter ones there are works and actions—for example, of the eye, the nostril, and the entire face; of the finger, the hand, and the entire arm. And since the actions and the movements present both in whole animals and in the parts of these are multiform, it is necessary for the things they are composed of to have dissimilar capacities; for softness is useful for some, hardness for others, and some must have elasticity, others the capacity to bend. The uniform parts receive the capacities of this sort one by one (for one of them is soft, another hard; one wet, another dry; one viscous, another brittle), but the non-uniform parts receive them many at a time and compounded together with each other; for the capacities useful to the hand for compressing and for grasping are distinct. That is why the instrumental parts have been composed of bones, sinews, flesh, and the other parts of this sort, but not the latter from the former.

As being for the sake of something, then, these parts[31] are, due to this cause,[32] related in the way just mentioned; but since the way in which it is necessary that they are like this is also sought, it is evident that the relationship preexisted of necessity between them in this way. For the non-uniform parts admitted of being composed of the uniform parts, either of many of them or of one—for example, some of the viscera; for they are multiform in configuration, though they are composed of a uniform body, simply speaking. But for the uniform bodies to be composed of the non-uniform ones is impossible; for then the uniform part would be composed of many non-uniform ones.

These, then, are the causes due to which some parts in the animals are simple and uniform, while others are composite and non-uniform. **647^{a}1**

Some of the parts in animals are instrumental, others are perceptual organs, and each of the instrumental parts is non-uniform, as was said previously,[33] while perception is produced in all the uniform parts, because perceptions of any sort whatever are of a sort to be of one kind, and because for each of the perceptible [kinds] there is a perceptual organ receptive of it. But what potentially is undergoes something due to what actually is, so that the former one and latter one are the same in kind.[34] And that is why in the case of hands, face, or any of the parts of this sort, none of the natural scientists attempts to say that one is earth, another water, and another fire; but they do connect each of the perceptual organs to each of the elements, saying that one is air, another fire. And since perception is present in each of the simple parts, it is most of all reasonable for touch, though it occurs in a uniform part, to be produced in the least simple of the perceptual organs; for it most of all seems to be a

31. The non-uniform ones.
32. The for-the-sake-of-which or final cause.
33. 646^{b}14–17.
34. The kind of the perceptions and the perceptual kind are the same.

perception of many kinds of things, and the perceptible object falling under it seems to have many contrarieties, hot and cold, dry and wet, and yet others of this sort; and the perceptual organ for these—flesh and its analog—is the most corporeal of the perceptual organs. Since it is impossible for there to be an animal without perception, because of this too it would seem necessary for animals to have some uniform parts; for perception is found in these, while actions are present in them in virtue of the non-uniform parts.

But since the perceptual capacity, the one of moving the animal, and the nutritive one are in the same part of the body, as was said previously elsewhere,[35] it is necessary for there to be a primary part possessing starting-points of this sort; and insofar as it is receptive of all the perceptible objects, it is necessary to be one of the simple parts, and, insofar as it is capable of causing movement and action, one of the non-uniform ones. That is why in the bloodless animals the analog of the heart, and in the blooded ones the heart, is a part of this sort; for the heart is divisible into uniform parts, just like each of the other viscera, but because of the shape of its configuration, it is non-uniform.

Each of the parts called "viscera" follows along with the heart; for they are composed of the same matter; for the nature of all of these is bloody, because they are situated on blood-vessel-like ducts and their ramifications. Just as, then, with mud from flowing water, the other viscera are like silt from the flow of blood through the blood vessels; while the heart, because it is both the starting-point of the blood vessels and has within itself the primary capacity for crafting blood, is itself composed, as is reasonable, from nourishment of the sort that it receives. Why the viscera are bloody in shape has been stated, then, and why they are in one respect uniform and in another non-uniform.

2.2
The Uniform Parts; the Hot and the Cold

Among the uniform parts in the animals, some are soft and wet, others hard and solid. Those that are wet are either so generally, or up to the point that it is in their nature to be so—for example, blood, serum, fat, suet, marrow, semen, bile, milk (in those that have it), flesh, and the parts analogous to these; for not all the animals are made of these parts, but rather some are made of the analogs of some of them. Others of the uniform parts are dry and solid—for example, bone, spine, sinew, and blood vessel. Also, the division of the uniform parts, in fact, has a difference; for of some the part is synonymous with the whole, of others it is not synonymous—for example, a part of a blood vessel is blood vessel, but a part of a face is in no way a face.

35. E.g., *Somn.* 455b34–456a6, *Juv.* 468b28–469b11.

First, then, for the wet parts and for the dry ones there are many modes of cause. For some of them are the matter of the non-uniform parts (for each of the instrumental parts has been composed from these, from bones, sinews, flesh, and other parts of this sort, some contributing to its substance, some to its working); some of the wet parts are nourishment for the non-uniform parts (for all get their growth from liquid); and some turn out to be residues—for example, the sediment from dry nourishment and, in those with a bladder, from the wet.

Among these parts, the differences in relation to each other are for the sake of the better—for example, those of the other ones and of blood in relation to blood; for one is finer-grained, another coarser-grained, one purer, another more turbid, and further, one colder and another hotter, both in the parts of one animal (for the upper parts in one animal are distinguished from the lower ones by these differences), and in one animal in relation to another. And, in general, some animals are blooded, while others, in place of the blood, have another part of this sort. Coarser-grained and hotter blood are more productive of strength, while finer-grained and colder blood are more capable of perception and understanding. And the same difference is also exhibited by the things that are present as the analog of blood; that is why the bees and other animals of this sort are more practically wise in their nature than many blooded animals, and why, among blooded animals, those having cold and fine-grained blood are more practically wise than their contraries. But those with hot, fine-grained, and pure blood are best; for animals of this sort are at the same time in a good state for both courage and practical wisdom.

That is also why the upper parts differ in this way in relation to the lower ones, and, again, the male in relation to the female, and the right side of the body in relation to the left. Similarly, the other parts too, both the ones of this sort and the non-uniform parts, must be supposed to exhibit the difference, some for the better or worse, some for the works and the substance of each of the animals—for example, of two sorts of animals with eyes, the one sort are hard-eyed, the other wet-eyed; one sort do not have eyelids, the other do have them, for the greater exactness of sight.[36]

That it is necessary to have blood or something with the same nature as it, and what the nature of the blood is, by first making distinctions concerning hot and cold, one must also get a theoretical grasp on the relevant causes. For the nature of many things is referred back to these starting-points, and many people dispute about which sorts of animals and which parts of them are hot and which cold. For some say that the aquatic animals are hotter than the terrestrial ones, saying that the heat of their nature is in equilibrium with the coldness of their place, that the bloodless animals are hotter than the blooded ones, and the females than the males. For example, Parmenides and certain others say that women are hotter than men, on the supposition that it is because of their hotness and abundance of blood that the menses occur, while Empedocles says the contrary; further, some say that blood and bile are hot,

36. $657^{b}29$–$658^{a}10$.

while others say that one or the other of them is cold. If there is so much dispute about the hot and the cold, what must one suppose about the others? For to us these are the most manifest of the things with which perception is concerned.

It seems to be because things are said to be hotter in many ways that these disputes occur; for it seems that each of the parties has *something* to say in saying contrary things. That is why we must not overlook in what way, in the case of the things composed by nature, one should say that some are hot, others cold, some dry, others wet, since it seems evident that these things are pretty much the causes of death and life, and further, of sleeping and waking, prime of life and old age, sickness and health, while it is not the case that roughness and smoothness, heaviness and lightness, and (one might almost say) none of the others of this sort are. And this is reasonably so; for as was said previously elsewhere, the starting-points of the natural elements are these very things: hot, cold, dry, and wet.[37]

Are things said simply, or in many ways, to be hot? [To answer] one must certainly grasp what the work of the hotter is, or, if there are many, how many. In one way, then, something is said to be hotter when what touches it is made hotter by it; in another way what produces greater perception during touching, especially if accompanied by pain. But it seems that this can sometimes be false; for sometimes it is their state that is the cause of the feeling of pain in perceivers. Further, what is more capable of melting the meltable or more capable of burning the combustible is said to be hotter. Further, if the same thing is, in the one case, larger and, in the other, smaller, the larger is said to be hotter than the smaller.[38] In addition to these two, what cools not quickly but slowly is hotter, and what is heated more quickly is hotter in its nature, we say, than what is heated slowly, as we say that one thing is contrary to something because further away from it,[39] and another like it because closer to it.

One thing is said to be hotter than another, then, in at least this many ways, if not in more. But it is impossible for being hotter to belong to the same thing in all these ways. For boiling water heats more [effectively] than flame does, while flame burns and melts the combustible and meltable, but water does not. Further, boiling water is hotter than a small fire, but boiling water cools more quickly and more thoroughly than a small fire; for fire does not become cold,[40] but all water does. Further, boiling water is hotter to the touch than olive oil, but cools and solidifies more quickly. Further, blood is hotter to the touch than water or oil, but solidifies more quickly. Further, stones, iron, and things of this sort heat more slowly than water, but when they have been heated, they burn more.

In addition to these considerations, some things called "hot" have alien heat while some have their own proper heat, and it makes the greatest difference whether the

37. *GC* 2.2.

38. The temperature of the thing remains fixed; its size changes. It contains more heat (is hotter) when it is larger (*GC* 333^a30–34, *Mete.* 379^b2–6, 380^a34–$^b1$, 381^b18).

39. *Met.* 1055^a3–10.

40. Because it is intrinsically hot.

heat belongs in the latter or in the former way; for the former is close to being hot **649a1**
coincidentally, but not intrinsically, just as if one were to say, if someone with a fever
happened to be musical, that the musical person was hotter than the one with the
heat that accompanies health. But if one thing is intrinsically hot and another coinci- 5
dentally hot, what is intrinsically hot cools more slowly, but the coincidentally hot is
often hotter to perception; again, what is intrinsically hot burns more—for example,
flame burns more than boiling water, while boiling water, which is coincidentally 10
hot, is hotter to the touch.

So it is evident that to judge which of two things is hotter is not simple; for in one way this will be hotter, in another that will be. In some cases of this sort, it is not possible either to say simply that something is, or is not, hot; for what turns out to be the underlying subject is not hot, but coupled together with heat, as if someone were 15
to give a name to hot water or hot iron.[41] It is in this way, in fact, that blood is hot. And this makes it evident that in cases of this sort, in which the underlying subject is hot in virtue of being affected, the cold is not a certain nature,[42] but a privation. Maybe even the nature of fire, in certain cases, is something of this sort; for perhaps 20
the underlying subject is smoke or charcoal, of which the former is always hot (for smoke is an exhalation), while charcoal, when extinguished, is cold. Also, olive oil and pine resin can become cold.

Also possessing heat are pretty much all the things that have been burned—for example, cinders, ashes, the excrement of animals, and, among the residues, 25
bile[43]—due to having been burned and some heat having been left behind in them. But pine resin and the fats are hot in another way, by changing quickly into what is actively fire.

The hot seems both to solidify and to melt. In fact, everything that consists of water only the cold solidifies, while all those consisting of earth, fire does; and among 30
hot things, all those that consist more of earth are solidified quickly due to cold and are insoluble, while those that consist more of water are soluble. But determinations about what sorts of things are solidifiable, and due to what causes they are solidified, have been made more perspicuously elsewhere.[44]

The question of what the hot is and of what sort of thing is hotter, since things are said to be hot and hotter in many ways, will not apply in the same way to all things, 35
but it must be determined in addition that this thing in question is intrinsically hot, **649b1**
while that other is often hot coincidentally; further, that this one is hot potentially, that one actively; and this one in this way, by being hotter to the touch, that one by producing flame and fire. And since things are called "hot" in many ways, it will 5
clearly follow that the same account also applies to "cold."

As regards hot and cold and their degrees, let things be determined in this way.

41. *Met.* 1029b1–1030a17.
42. Reading οὐ φύσις τις ἀλλὰ στέρησίς.
43. The latter two by the inner heat of the animal.
44. *Mete.* 4.6–7.

2.3
The Dry and the Wet; Blood

The next task is also to discuss the dry and wet in a way that conforms with what has been said. Things are also said to be these in many ways—for example, some potentially, others actively. For ice and all solidified wet things are said to be actively and coincidentally dry, since they are potentially and intrinsically wet, while earth, ash, and things of this sort are actively and coincidentally wet when they have been mixed with liquid, but intrinsically and potentially they are dry. But when the mixtures have been disaggregated, the parts that are composed of water are liquid and are both actively and potentially wet, while those composed of earth are all dry. And strictly and unconditionally, things are most of all said to be dry in this way. It is the same way too with the others, the wet things: strictly and unconditionally "wet" holds of them in accord with the same account; and it is the same way in the case of hot things and cold ones.

Now that these things have been determined, it is evident that blood is in a way hot, insofar as what it is for it to be blood[45] is concerned (for something is said to be blood exactly as if we were to signify hot water by a certain name), but the underlying subject, what exactly it is that is blood, is not hot; and in one way blood is intrinsically hot and in another way it is not. For heat will belong in its account, just as pale does in that of the pale human being; but insofar as blood is hot in virtue of an affection, it is not intrinsically hot. It is the same way too as regards dry and wet. That is why, in the nature of the things of this sort[46] too, some, like blood, are hot and wet, but when separated solidify and appear cold, while others, like bile, are hot and coarse-grained, but when separated from the nature of their possessors undergo the contrary, becoming cold and liquified; for while blood becomes more dry, yellow bile becomes more liquid. But to participate more and less in these opposites must be posited as belonging to these things.

In what way, then, the nature of blood is hot, in what way cold, and in what way it shares in their contraries has pretty much been stated.

Since it is necessary for everything that grows to get nourishment, and nourishment in every case is from wet and dry, and the concoction and change of these things occurs due to the capacity of the hot, all the animals and plants (even if due to no other cause, but rather due to this one) necessarily have a natural starting-point for heat—and it, like the workings[47] on the nourishment, is shared by numerous parts. For the first evident service [of nourishment] to the animals is effected due to the mouth and the parts within it (in the case of those whose nourishment must be cut up). But this is in no way a cause of concoction, but rather of good concoction; for

45. Reading οἷον ἦν αὐτῷ τὸ αἵματι εἶναι.
46. I.e., those that are hot, dry, or wet.
47. Reading καὶ αὕτη ὥσπερ αἱ ἐργασίαι.

the division of the nourishment into small pieces makes the working on it by the heat easier. At that point, the working of the upper and lower stomach, with the aid of the natural heat, produces the concoction.

Just as the mouth is a duct for nourishment that has not been worked up, and as the part continuous with it that they call the "esophagus," in those animals that have this part, extends into the stomach, so too there must be many other starting-points, through which the body gets all the nourishment—just as from a trough—from the stomach and from the nature of the intestines. For while the plants get their worked-up nourishment from the earth through their roots (which is why, in fact, residues do not occur in plants; for plants use the earth and its heat as a stomach), pretty much all the animals, and the ones that move by walking manifestly, have the cavity of the stomach like an earth within them, from which, just as the plants do by means of their roots, they must by some means get their nourishment, until the end of the continuous process of concoction is attained. For the working of the mouth transmits the nourishment to the stomach, and it is necessary for something else to get it from this, which is precisely what occurs; for the blood vessels extend through the entirety of the mesentery,[48] starting beneath the stomach and extending up to it. These things must be observed with the help of the *Dissections* and the *History of Animals*.[49]

Since there is something that is a receptacle for all nourishment and for the residues that are produced, and the blood vessels are like a container for blood, it is evident that blood is the final nourishment for the blooded animals, and its analog for the bloodless ones. And that is why not getting nourishment diminishes the blood, while getting nourishment increases it, and why, when it is good, the blood is healthy, and when it is bad, the blood is bad. **$650^{b}1$**

That the blood is present for the sake of nourishment in the blooded animals is evident from these considerations and others of this sort. And that is why, in fact, its being touched does not produce perception, any more than any of the other residues. Nor is nourishment like flesh; for its being touched does produce perception. For blood is not continuous with flesh, nor of the same nature as it, but is found lying in the heart and in the blood vessels like in a container.

But the way in which the parts get their growth from the blood, and further, growth in general, are more properly discussed in the *Generation of Animals*[50] and elsewhere.[51] Now, though, let this much be said (for this much is useful), that blood is for the sake of nourishment, that is, nourishment of the parts.

48. *HA* $495^{b}31$–$496^{a}2$.
49. 3.4.
50. *GA* $740^{a}21$–$^{b}12$, $743^{a}8$–17.
51. *GC* $321^{a}22$–$322^{a}33$, *DA* $416^{a}19$–$^{b}30$, and the lost *On Nourishment* or *On Growth and Nourishment*, also referred to at $653^{b}14$, $674^{a}20$, $678^{a}19$, *GA* $784^{b}2$, *Somn*. $456^{b}6$, and perhaps *Mete.* $381^{b}13$.

2.4
Blood Fibers; Serum

Some blood has so-called fibers; some does not have them—for example, that of the deer and the roe deer. That is why this sort of blood does not solidify; for the part of the blood that is watery is colder (which is also why it does not solidify), while the part of it that is earthen solidifies when the liquid evaporates; and the fibers are composed of earth.[52]

Some, at any rate, of the animals also have greater subtlety of thought, not because of the coldness of their blood, but rather because of its fine-grainedness and purity; for what is earthen has neither of these affections. For those animals with finer-grained and purer liquid have their perception more easily moved. Because of this, indeed, even some of the bloodless animals have a more comprehending soul than some of the blooded ones, as was said previously[53]—for example, the bee, the ant kind, and any others of this sort that there may be.

The animals that are very watery are more cowardly; for fear cools. Those, then, that have a blend of this sort in the heart are predisposed to this affection; for water is solidified by cold. That, and other things, is why the bloodless animals are more cowardly than the blooded ones, simply speaking, and why, when afraid, they become immobile, release residues, and, in some cases, change color. On the other hand, those that have very fibrous, coarse-grained [blood] are more earthen in their nature, are both spirited in character and excitable because of their spirit. For spirit is productive of heat, and solids that have been heated heat more than liquids do, and the fibers are solid and earthen, so that they become like sparks in the blood, and produce a boiling in the spirited parts. That is why the bulls and the boars are spirited and excitable; for their blood is most fibrous, and that of the bull, indeed, solidifies most quickly of all. But when these fibers are removed, their blood does not solidify; for just as if one were to remove the earth from mud, the water would not solidify, so it is too with blood; for the fibers are earth. But if they are not removed, the blood is solidified, like watery earth is solidified by cold; for the liquid evaporates when the heat is squeezed out by the cold, as was said previously,[54] and watery earth is solidified not by heat, but by being dried by the cold. And in those bodies there is liquid due to the heat that is present in animals.

The nature of blood is a cause of many things, both with regard to the character of the animals and with regard to perception, and reasonably so; for blood is matter for the entire body; for nourishment is matter, and blood is the last nourishment.[55]

52. *Mete*. 384ᵃ26–33.
53. 648ᵃ5–10.
54. 650ᵇ17–18.
55. 650ᵃ34–35.

It makes a great difference, then, whether it is hot or cold, fine-grained or coarse-grained, turbid or pure.

Serum is the part of the blood that is watery, either because it has not yet been concocted or has been destroyed, so that the serum exists, on the one hand, of necessity, and, on the other, for the sake of blood.

2.5
Fat and Suet

Fat and suet[56] differ from each other in accord with the difference of the blood. For each of them is blood, when—though well-concocted and well-nourished—it has been concocted due to good nourishment and has not been used up in the fleshy part of the animals. Their oiliness makes this clear; for among the wet things, oil is a combination of air and fire. That is why none of the bloodless animals has either fat or suet, because they do not even have blood.

Among the blooded animals, the ones with more corporeal[57] blood have more suet. For suet is earthen, which is why it solidifies, just as what is fibrous itself and soups of this sort do; for it contains little water, but a lot of earth. That is why animals without two rows of teeth, but with horns, have suet. It is evident that the nature of these animals is full of this sort of element, since they are horned and have knuckle-bones; for all these parts are dry and earthen in nature. But those with two rows of teeth, no horns, and multi-split feet have fat rather than suet, which neither solidifies nor breaks in pieces when it is dried, because its nature is not earthen.

When these things are present in moderate quantities in the parts of animals, they are beneficial (for they do not impede perception, but are an aid to health and capacity), but when they are excessive in quantity they are destructive and harmful. **$651^{b}1$** For if the entire body were to become fat and suet, it would perish. For something is an animal in virtue of its perceptual part, and it is the flesh and its analog that are capable of perceiving; but the blood, as was said previously,[58] does not have perception, which is why neither fat nor suet does; for they are concocted blood. So, if the entire body were to become of this sort, it would not have any perception at all.

That is also why very fat animals age quickly; for they are blood-deficient, inasmuch as their blood gets used up to make the fat, and those with a blood deficiency are already on the road to passing away. For passing away is a sort of blood deficiency, and what is deficient is affectable by any random cold and heat. And fat animals are more infertile due to the same cause; for what should have gone from the blood to make semen and seed is used up to make fat and suet; for when blood is concocted,

56. *HA* 3.17–18.
57. I.e., more earthen.
58. $650^{b}1–5$; also $656^{b}19–22$.

it becomes these things, so that in these animals either no residue is produced at all, or else little is.

As regards blood, serum, fat, and suet, both what each of them is and due to what sorts of causes has now been stated.

2.6
Marrow

Marrow too is a certain nature of blood, and not, as some people think,[59] a spermatic capacity of the semen. This is clear in the altogether young; for inasmuch as in fetuses the parts are composed, and the nourishment consists, of blood, the marrow in their bones is also bloodlike. But when they grow and are concocted, just as the parts and the viscera change color (for each of the viscera is also excessively bloodlike when animals are still young), in the same way the marrow does too; and among animals with fat, the marrow is oily and like fat, while in those in which it is not like fat, but in which concocted blood becomes suet, it is suety. That is why in those animals with horns and without two rows of teeth the marrow is suety, while in those with two rows of teeth and multi-split feet it is fatty. The marrow of the spinal column, though, is the sort that is least fatty, because it must be continuous and extend through the entire spinal column, which is divided into vertebrae; if it were either oily or suety, it would not be continuous in the same way, but would be either shatterable or wet.

Some of the animals do not have any marrow worth mentioning, these are the ones that have strong and dense bones, like those of the lion; for the bones of this animal, because they have altogether no [visible] trace of it, seem not to have any marrow at all.[60] But since it is necessary for the nature of the bones, or of what is analogous to the bones (for example, fish-spine in aquatic ones), to be present in animals, it is also necessary for marrow to be present in some, when the nourishment from which the bones are produced is enclosed. And that the nourishment for all the parts is blood was said previously.[61]

It is reasonable too that there are marrows that are suety and that are fatty; for it is because of the heat produced by being enclosed by the bones that the blood is concocted, and the intrinsic concoction of blood is suet and fat. Also, in those that have bones that are dense and strong, it is reasonable that in certain ones marrow is not present, while in others little is present; for the nourishment is used up for the bones. In those that have not bones but fish-spine, the spinal column alone has marrow, both because they are by nature blood-deficient, and because the spinal column is the only hollow fish-spine. That is why it is in it that marrow is produced; for it alone has room and it alone, because of its divisions, has need of something to

59. Plato, *Timaeus* 74a, 77d, 86c, 91b.
60. Cf. *HA* 521b11–16.
61. 650b11–13.

bind it together. That is also why the marrow there, as was said,[62] is of another sort altogether; for, because it is produced in place of a ligament, it is viscous and sinewy, in order that it have elasticity.

Why, then, animals with marrow have marrow has been stated; and what marrow is, is evident from these considerations: it is the residue of nourishment from the blood, distributed to bones and fish-spine, when it has been concocted and enclosed.

2.7
The Brain

Pretty much the next thing to talk about is the brain; for to many people the brain too seems to be marrow, even the starting-point of marrow,[63] because of their seeing the continuity of the spinal-column marrow with it. Yet the brain is (one might almost say) entirely the contrary to marrow in its nature; for while the brain is among the coldest parts in the body, the marrow is in nature hot; its oiliness and fattiness make this clear. That is also why the spinal-column marrow is continuous with the brain; for nature always devises, as a protection against the excess of each thing, the constant presence of its contrary, in order that the one equalize the excess of the other.

That marrow is hot is clear from many considerations. The coldness of the brain, on the other hand, is evident to the touch. Further, it is the most bloodless of all the wet parts in the body (indeed, it has no blood at all in it), and the driest. And it is neither a residue nor one of the continuous parts, but has a special nature, and **$652^{b}1$** reasonably so.

That the brain has no continuity with any of the perceptual parts is clear even by looking at it, and yet more so due to its producing no perception at all when touched, any more than touching the blood or the residues of the animals does. Rather, it is present in animals for the preservation of their entire nature. For while some[64] posit in an unrefined way that fire or some other such capacity is the animal's soul, it is perhaps better to say that it is composed in a certain body of this sort.[65] The cause of this is that the hot is the most capable of the bodies in assisting with the works of the soul; for nourishing and causing movement are works of soul, and these things occur most of all in virtue of this capacity. To say that fire is the soul, then, is like saying that the saw or the drill is the carpenter or the craft of carpentry, because the work gets completed when they are near each other. That it is necessary for animals to participate in heat is clear from these considerations.

But since everything needs a counterbalance in order to hit upon the moderate state and the mean (for the mean has the substance and the account, while each of

62. $651^{b}32–36$.
63. Plato, *Timaeus* 73d, 91b.
64. E.g., Heraclitus.
65. I.e., in one that is fiery or hot.

the extremes separately does not have them), due to this cause, against the heart's place and the heat in it, nature has devised the brain, and it is for the sake of this that this part is present in animals, since it has a nature that is a combination of earth and water. And because of this the blooded animals all have a brain, but (one might almost say) none of the others does, except for those that have one by analogy—for example, the octopus; for they all have little heat due to their bloodlessness.

The brain, then, makes the heat and boiling in the heart well blended;[66] and in order that this part too hit upon moderate heat, the blood vessels extend both from the great blood vessel and from the so-called aorta[67] to the membrane around the brain. And to prevent its being damaged by the heat, in place of a few large ones, dense arrays of thin blood vessels encompass it, and in place of turbid,[68] coarse-grained blood, blood that is fine-grained and pure. That is also why the fluxes in bodies come from the head as their starting-point, in all those cases in which the place around the brain is colder than the proportional blend; for when the nourishment is being vaporized upward through the blood vessels, the residue that is being cooled due to the capacity of this place produces fluxes of phlegm and serum. Likening a small thing to a large one, one must take this to happen in a similar way to the generation of rain; for, on being vaporized, the mist is carried by the heat from the earth to the upper place, and when it is in the air above the earth, which is cold, it is composed back into water because of the cooling, and falls back down to earth.[69] But about these things it is fitting to speak in studies concerning the starting-points of diseases, to the extent that it belongs to natural philosophy[70] to speak about them.

It is this part too that produces sleep in the case of the animals that have a brain, while in those without one, it is its analog. For by cooling the flow of blood from the nourishment, or else due to certain other similar causes, it weighs down the [brain's] place (which is why those who are sleepy are heavy-headed) and makes the heat escape downward along with the blood. That is why, when heat gathers in large quantities in the lower place, it produces sleep, and takes away the capacity to be upright from all those animals whose nature is to be upright, and from the others, the capacity to hold their head upright. These things have been spoken about by themselves both in the studies making determinations about perception and those about sleep.[71]

That the brain is a combination of water and earth is made clear by the following fact about it; for when boiled it becomes dry and hard, and the earth material remains when the water has evaporated due to the heat, just as in the case of the boiled mushes from legumes and from other crops—because the greatest part of them is

66. *GA* 744ᵃ26–31.
67. *HA* 513ᵃ20–27.
68. Reading θολεροῦ. See 647ᵇ32.
69. *Mete.* 346ᵇ20–33, *Somn.* 457ᵇ31–458ᵃ5.
70. *Met.* 6.1.
71. *Sens.* and *Somn.*

earth—when the mixed-in liquid departs; for these too become altogether hard and earthen.

Among the animals, it is the human being that has the largest brain for its size, and among the human beings, the males have a larger brain than the females; for the place around the heart and the lung is also hottest and fullest of blood. That is also why, alone among the animals, the human being is upright; for, by prevailing, the nature of heat produces growth from the middle in accord with its own spatial movement.[72]

Against a large quantity of heat, then, a large quantity of wetness and coldness is opposed, and because of this abundance, the bone around the head, which some call the "bregma," is the last to solidify, due to the large quantity of time the heat takes to evaporate it. This happens in none of the other blooded animals.

The human being also has many sutures around the head, and the male more than the female, due to the same cause, in order that the place breathe freely, and **$653^{b}1$** all the more so the larger the brain; for if it becomes too dry or too wet it will not do its work, and either will not cool the blood or will solidify it, so that it produces diseases, fits of madness, and deaths; for the heat in the heart and the starting-point is most susceptible of feeling the affections of the other parts of the body and quickly produces a perception of any change or affection in the blood around the brain.

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As regards the innate liquids produced in the animals, then, pretty much all of them have been spoken about. As regards those produced later, there are the residues of the nourishment, the sediment from both the bladder and the bowel; and besides these, semen and milk, in those that naturally have each of these. But the studies concerning the theoretical investigation of the residues of the nourishment contain the accounts proper to these (stating in which animals they are present, and due to which causes), while those concerning seed and milk are contained in the studies concerning generation[73] (for seed is a starting-point of generation and milk is for the sake of generation).

2.8
Flesh

The other uniform parts must now be investigated: first, flesh, in those animals that have flesh, and in the other animals its analog; for flesh is a starting-point and intrinsic body of the animals. This is clear even from the account; for we define the animal by its possessing perception, and primarily by the primary sort, which is touch, and

72. I.e., upward.
73. *GA* 1.19–23, 2.2–3 (seed), 4.8 (milk).

of it the perceptual organ is a part of this sort,[74] either the primary one, like the eye-
25 jelly is of sight, or it taken together with the medium,[75] as if one were to add to the eye-jelly the transparent in its entirety. In the case of the other perceptual modalities, to do this would both be by nature impossible and contribute nothing to the work; but in the case of the capacity of touch it is necessary; for among the perceptual organs, it alone, or it most of all, is corporeal.

30 It is evident from perception, on the other hand, that all the other uniform parts are for the sake of the flesh, I mean, for example, bone, skin, sinews, blood vessels, and further, hair, and the claw kind, and any other parts of this sort that there may be. For the nature of the bones has been devised—since it is hard—for the sake of preserving something soft in those animals that have bones; and in those that do not
35 have them, its analog—for example, in some fishes, fish-spine, in others cartilage.

Some of the animals have this sort of protection inside, but some of the bloodless
654ᵃ1 ones have it outside, like each of the soft-shelled animals—for example, the crabs and the crayfish kind; and it is the same way for the hard-shelled-animal kind—for example, the ones called "oysters"; for in all these the fleshy part is inside, while the containing and protecting earthen part is outside; for in addition to the protection
5 provided by a container, the shell—in those that, since they are bloodless, have little natural heat—protects the heat being kindled in them, like a sort of cover put around them. The turtle and the freshwater-turtle kind seem to be the same way, though they are of another kind[76] than the former.

The insects[77] and the soft-bodied animals are composed in a contrary way to these,
10 and in an opposite way to each other; for none of them seems to have a distinctly formed bony or earthen part worth mentioning, but while the soft-bodied animals are pretty much entirely fleshy and soft, to prevent their body from being easily
15 destroyed, as fleshy things are, their nature is intermediate between flesh and sinew. For while it is soft, like flesh, it has elasticity, like sinew; and its mode of splitting is that of flesh, dividing not in a straight line but in circles; for this way of splitting would be most useful for strength.

There is also present in these animals an analog of the spines of fishes—for exam-
20 ple, in the cuttlefishes there is a part called the "sepium," and in the calamaries, the one called the "sword." The octopuses, on the other hand, have no part of this sort, because it has a small cavity (the so-called head), while the others have one of considerable length. That is why, for their straightness and inflexibility, nature traced
25 out these parts, just as, among the blooded animals, it traced out bone in some and spine in others.[78]

74. I.e., flesh and its analog.
75. *DA* 2.11.
76. I.e., blooded animals.
77. *HA* 487ᵃ32–34.
78. *GA* 743ᵇ20–25.

As for the insects, they have things in a contrary way both to the soft-bodied and to the blooded animals, as we said.[79] For none of them has a hard part distinguished from the soft one, but rather their entire body is hard; the hardness, though, is of such a sort that, though more fleshy than bone, is more bony and earthen than flesh, to prevent their body from being easily divisible.

2.9
Bone

The nature of the bones and that of the blood vessels are similar. For each of them, having started from one thing, is continuous, and there is no such thing as a bone by itself, but rather it is a part of something as continuous with it or else being in contact with it or being bound to it, in order for nature to use it both as one and continuous and—with an eye to bending—as two and divided. Similarly too, there **$654^{b}1$** is no such thing as a blood vessel by itself, but rather all blood vessels are part of one. And in fact, if any bone were separate, it would not do the work for the sake of which the nature of the bones exists (for it would not be a cause either of bending or of straightening at all, if it were not continuous but had gaps). And further, it would be harmful, like a sort of thorn or sting present in the flesh. And if some blood vessel were separate and not continuous with its starting-point, the blood in it would not be preserved; for the heat from that starting-point prevents the blood from solidifying; it is evident too that separated blood putrefies.

The starting-point of the blood vessels is the heart, but that of the bones, in all animals that have them, is the so-called spinal column, with which the nature of all the other bones is continuous. For the spinal column is what maintains the length and straightness of the animals. And since it is necessary when the animal moves for its body to bend, the spinal column, though it is one thing because of its continuity, is multipartite due to the division of the vertebrae. Extending from the spinal column in the animals that have limbs, and continuous with it, the bones of these limbs are articulated. Insofar as the limbs have a bend, the bones are bound together by sinews and their extremities fit together, since either one is hollow and the other rounded, or both are hollow, enclosing a knucklebone—like a fastener—in the middle, in order that bending and extension occur; for otherwise it would either be entirely impossible for the limbs to make a movement of this sort, or else they would not do it well. Some of them, though, have the starting-point of one like the end-point of the other, and are bound together by sinews. There are also cartilaginous parts in between the parts responsible for bending, like a pad, so that they do not rub against each other.

Around the bones, fastened to them by thin sinewy bonds, it is the fleshy parts that naturally grow, for the sake of which the bone kind exists. For just as those who

79. $654^{a}9$–11.

mold an animal from clay, or some other wet composition, put one of the solid bodies underneath as a support, then mold the clay around it, so in the same way nature has crafted the animal from the fleshy parts. Bones, then, lie underneath the others, the fleshy parts: in those that move by means of a bend, bones are for the sake of this; in those that are immobile, they are for the sake of protection—for example, the ribs enclosing the chest are for the sake of preserving the viscera around the heart. The **655[a]1** region around the stomach is boneless in all animals, in order that nothing prevent the swelling produced of necessity in animals due to the nourishment, and in females due to the growth of the fetuses within them.

In the animals that are live-bearing, both internally and externally,[80] the capacity of their bones is much the same and strong. For all animals of this sort are much larger [bone-wise], so to speak, in comparison to their bodies, than the sort that are not live-bearing. In some places, in fact, there are many large live-bearing animals—for example, in Libya and in the places that are hot and dry. And for those that are large there must be supports that are stronger, larger, and harder—especially for those of them that make greater use of force. That is why the bones of the males are harder than the bones of the females, especially those of the carnivores (for they get their nourishment through fighting), such as those of the lion; for it has bones that are so hard in nature that a fire is kindled when they are struck, just as it is from stones. The dolphin too has not fish-spines but bones; for it is live-bearing.

In those that are blooded but not live-bearing nature causes them to differ by small degrees—for example, in the case of the birds, though they do have bones, they have weaker ones; in the case of the fishes, those that lay eggs have fish-spine; and in the case of the snakes the nature of the bones is like that of fish-spine, except in the very large ones. In these, due to precisely the same things as in the live-bearing animals, for purposes of strength, the skeleton framework must be stronger.

But the so-called selachians are cartilaginous-spined in nature; for it is necessary for their movement to be more fluid, so that the nature of their supports must also be not brittle, but softer, and because the nature has used up all the earthen material for the skin; and the nature cannot distribute the same excess to many places at the same time.

Present in the live-bearing animals too are many bones that are cartilaginous, in all those cases where it is advantageous for the solid part to be soft and mucilaginous because of the surrounding flesh, as happens, for example, in connection with the ears and the nostrils; for brittle things in protruding parts are quickly shattered. The nature of cartilage and that of bone are the same, though they differ by the more and less; that is also why neither grows [back] when it has been cut.

The sorts of cartilage in the terrestrial animals have no marrow, that is, no separated marrow; for when marrow that is separate is mixed into the entire mass, it

80. *HA* 489[b]10–12.

makes the composition of the cartilage soft and mucilaginous.[81] But in the selachians, though the spinal column is cartilaginous, it does have marrow; for in them, it is in place of bone that this part is present. **$655^{b}1$**

To the touch closely allied to the bones are such part as claws, solid and split hooves, horns, and the beaks of birds. The animals have all these parts for the sake of protection; for the wholes composed of and synonymous with their parts—for example, the whole horn or hoof—have been devised with a view to the preservation of each of them.

The nature of the teeth also belongs in this kind, in some cases being present for a single work, the working up of the nourishment, in other cases both for this and for strength—for example, in all those with saw-like teeth or with tusks. Of necessity all these parts are earthen and have a solid nature; for this is the capacity characteristic of a weapon. That is also why all parts of this sort are present more in the four-footed live-bearing animals, because all of them have a more earthen composition than humankind does.

But as regards these parts and the succeeding ones (for example, the skin, the bladder, the membrane, the hair, the feathers, the analogs of these, and any other parts of this sort that there may be), it is necessary to get a theoretical grasp on them later on, at the same time as on the non-uniform parts, and for the sake of what each is present in animals; for it is from their works, as with the latter parts, that it will be necessary to know these too. But since these parts are synonymous with their wholes, they have been taken out of order now, with the uniform parts. The bone and the flesh are starting-points for all these. Further, we have omitted semen and milk in our theoretical investigation of the liquid and uniform parts; for it is to the *Generation of Animals*[82] that the investigation of these more fittingly belongs. The former is a starting-point while the latter is the nourishment of generated beings.

2.10
The Non-uniform Parts

Now we must speak as if once again at the starting-point, starting first with the ones that are primary. For in all the animals that are complete there are two parts that are most necessary, the one by which they receive the nourishment and the one by which they release[83] the residue; for it is impossible to exist or to grow without nourishment.

The plants (for these also live, we say) do not have a place for useless residue; for from the earth they get nourishment that has already been concocted, and in place of this residue, they release their seeds and their fruit. A third part in all living

81. Reading μυξώδη.
82. 1.19–23, 2.2–3 (semen), 4.8 (milk).
83. Reading ἀφιᾶσιν.

things is intermediate between these, the one in which the starting-point of their life is present.

It is the nature of plants, stationary as it is, not to have multiform non-uniform
656ᵃ1 parts; for, for a few actions, the use of a few instruments is enough; that is why it is necessary to observe the visible forms of these by themselves.[84] But the living things that have perception in addition to life are more multiform in appearance, and some
5 of them more so than others, and yet more prolific in it are all those whose nature participates not only in living, but also in living well.

Humankind is like this; for it alone of all the animals well-known to us participates in the divine, or it most of all. So both because of this and because the shape of
10 the external parts of humankind is most well-known, it must be spoken about first. For, to start with, it is in this kind alone that the parts that are present by nature are also in accord with nature, that is, the upper part of it is toward the upper part of the universe; for the human being is the only animal that stands upright.

That it has a fleshless head follows of necessity from what was said about the
15 brain.[85] For it is not the case, as some people say,[86] that if the head were fleshy, the kind would be longer-lived, but it is fleshless, they say, for the sake of good perception; animals perceive by means of the brain, and parts that are very fleshy do not admit perception. Neither of these claims is true; instead, if the place around the
20 brain were very fleshy, it would produce the contrary of that for the sake of which the brain is present in animals (for it would not be able to cool, if it were very warm); and it is not the cause of any of the perceptual modalities, since it, at any rate, is without perception, just like any of the residues. But not finding the cause due to which some
25 of the perceptions are in the head in animals, but seeing that the brain is more special[87] than the other parts, they couple these two things together by means of a deduction.

That the starting-point of the perceptual modalities is the place around the heart was determined previously in the discussions of perception,[88] and also why two of
30 them, touch and taste, manifestly depend on the heart, why, of the three others, that of smell is intermediate between hearing and sight, which are mostly located in the head (because of the nature of their perceptual organs), and why of these, the organ of sight is [located in the head] in all animals. Hearing and smell in the case of the fishes and animals of this sort make what was just said evident; for these hear and
35 smell, though they have in the head no apparent perceptual organ for these perceptibles. And that the organ of sight, in all those animals that have it, is located in the region around the brain is reasonable; for the brain is wet and cold, and the organ
656ᵇ1 of sight is in its nature water; for among transparent things, water is the most easily

84. Since they are unlike the animals in this respect.
85. 2.7.
86. Plato, *Timaeus* 75a–c.
87. Reading ἰδιώτερον.
88. E.g., *Somn.* 455ᵇ34–456ᵃ5, *Juv.* 468ᵇ28–469ᵇ10.

confined.[89] Further, the more exact of the perceptual modalities of necessity become more exact due to the parts that have purer blood; for the movement of the heat in the blood knocks out the activity of the perceptual part.[90] It is due to these causes that these perceptual organs are in the head.

It is not only the front of the head that is fleshless, but also the back, because in all those that have it this part must be as upright as possible; for nothing holding a burden is capable of being upright, but the head would be a thing of this sort if it were covered with flesh. From this too it is clear that the head is not fleshless for the sake of the brain's perception; for the back of the head contains no brain, but is fleshless nonetheless. It is also reasonable that some of the animals have hearing in the region around the head; for the part called "void" is full of air, and the organ of hearing, we say, is of [the nature of] air.[91] From the eyes ducts go to the blood vessels around the brain; and again from the ears in like manner a duct connects to the back of the brain. Nothing bloodless, though, is capable of perception, nor is the blood itself, but rather some of the things composed of this. That is precisely why nothing bloodless in the blooded animals is capable of perception, nor is blood; for it is no part of the animals.[92]

All those with this part have the brain in the front, because the front is directed toward what is perceived, perception stems from the heart, the heart is among the parts in the front, and perceiving occurs by means of the blooded parts, while the cavity in the back [of the head] is empty of blood vessels. The perceptual organs have thus been ordered by nature in a good way, with those for hearing on the middle of the circumference (for one hears not only in a straight line but in all directions), those for sight in front (for one sees in a straight line, movement is in a forward direction, and one must look before one in the direction the movement is toward[93]). That the organ of smell is placed between the eyes is reasonable. For each of the perceptual organs is double because the body is double, one part the right, the other the left. In the case of touch, though, this is not clear; the cause of this is that the primary perceptual organ is not the flesh or a part of that sort but something internal.[94] In the case of the tongue it is less clear [than in the case of eyes and ears], but more so than in the case of touch; for this perceptual modality is like a sort of touch.[95] Nonetheless, it is clear even in the case of the tongue; for it is visibly divided.[96] **657^{a}1**

89. *Sens.* 438^{a}12–19.
90. *GA* 780^{a}7–14.
91. *DA* 419^{b}34–420^{a}6, *Sens.* 438^{b}20.
92. 656^{b}21–22. Cf. *HA* 487^{a}1–3, 511^{b}1–2.
93. *IA* 705^{b}8–13.
94. *DA* 2.11.
95. *DA* 2.10.
96. Aristotle is presumably thinking of the underside of the human tongue. In snakes the divide is yet more apparent.

But it is in the case of the other perceptual organs that the perceptual modality is most manifestly double; for there are two ears, two eyes, and the capacity of the nostrils is double in nature. Were the capacity of the nostrils situated in another way, that is, separated as the capacity of hearing is, it could not do its work, nor could the part it is in; for this perception, in animals with nostrils, occurs through breathing, and this part is in the middle and in front. That is why nature has brought together the nostrils in the middle of the three perceptual organs, placing them, as it were, on a single line for the movement of breathing.

2.11
The Ears of the Four-Footed Animals

In the other animals[97] the perceptual organs have also been well placed in relation to the special nature of each. For the four-footed animals have their ears detached and above the eyes, or so it would seem. But it is not so. Instead, it appears to be so because these animals are not upright but bent forward. And since they mostly move in this position, it is useful for the ears to be both higher up and movable; for when rotated they better receive sounds from every direction.

2.12
Hearing in Various Animals

The birds have auditory ducts only because of the hardness of their skin and not having hair but rather being feathered. They do not, then, have the sort of matter from which ears are molded.[98] It is also the same way with the four-footed egg-laying hard-scaled animals; for the same account also applies to these. Among the live-bearing animals, the seal also has not ears but auditory ducts, because it is a deformed four-footed animal.[99]

2.13
Eyelids

The human beings, the birds, and both the live-bearing and egg-laying four-footed animals have a protection for the eyes. The live-bearing ones have two eyelids, with which they also blink. The heavy birds[100] and some others close their eyes with the

97. I.e., other than the human being.
98. 654[b]29–32.
99. *HA* 498[a]31–[b]4, *GA* 781[b]22–28.
100. *GA* 749[b]10–25.

lower eyelid, as do the egg-laying four-footed animals. The birds blink with a membrane that comes from the corners of the eyes.

The cause of their having a protection is that the eyes are wet; in order that they see sharply they are this way due to their nature. For if the eyes were hard-skinned, they would be less liable to harm due to things from outside striking against them, but they would not be sharp-sighted. It is for the sake of the good, then, that the skin around the eye-jelly is thin,[101] while the eyelids are for the sake of its preservation. It is also because of this that all these animals blink, especially the human being. They all do so in order, by means of the eyelids, to prevent things from striking against [the eyes] (and this is not from deliberate choice, but rather nature did it), and the human being does so very often because the skin [around the eye-jelly] is very thin. **$657^{b}1$**

The eyelid is included in the skin; that is why in fact neither the eyelid nor the foreskin grow back together—because they are skin without flesh.

All the birds that close their eyes with the lower eyelid, and also the egg-laying four-footed animals, close them in this way because of the hardness of the skin around the head. For among the feathered animals, the heavy ones, because they are non-flyers, have the growth of their feathers diverted into the thickness of their skin. That is also why they close their eyes with the lower eyelid, while the pigeons and birds of this sort do so with both.

The four-footed egg-laying animals have hard scales, which are all harder than hair, so that their skin is also harder than the skin [of those with hair]. The skin around the head, then, is hard in these animals, which is why they do not have an upper eyelid, but the skin below is fleshy, so that the [lower] eyelid can have thinness and elasticity.

The heavy birds blink not with the lower eyelid but with the membrane, because the movement of their eyelid is slow, while blinking must occur quickly; and the membrane is like this. They blink from the corner next to the nostrils because it is better that the nature of the membranes be from one starting-point, and these have a starting-point at the connection to the nostril; and the front is more of a starting-point than the side.

The four-footed egg-laying animals do not blink in the same way [as the birds], because it is not necessary for them to have wet [eye-jelly] and exact vision, since they stay on the ground. But for the birds it is necessary; for they use their vision from afar. That is why, in fact, the crook-taloned birds are sharp-sighted (for they observe their nourishment from above, and that is why, among all the birds, these fly up to the heights), while those that stay on the ground and are non-flyers—for example, chickens and animals of this sort—are not sharp-sighted; for nothing related to their mode of life urgently requires it.

The fishes, the insects, and the hard-skinned animals have differing eyes, but none of them has eyelids. For the hard-skinned ones do not have them at all (for the use

101. *GA* $780^{a}25–36$.

of the eyelid involves the skin working quickly); but in place of this protection, all the hard-skinned animals are hard-eyed, as if seeing through an eyelid that has been attached [to the eye]. But since, because of the eye's hardness, it is necessary for them to see more dully, nature makes movable the eyes of the insects, and yet more so those in the hard-skinned animals (as it does the ears in some of the four-footed animals), so as to see more sharply, by turning toward the light and receiving its gleam.

The fishes are wet-eyed. For, since they do a lot of moving, they must use their vision from far off. In the case of the terrestrial animals, the air is easy to see through; but in the case of the fishes, since water is contrary to sharpness of seeing, but does not contain as many obstacles to vision as air does, because of this, they do not have eyelids (for nature does nothing pointlessly) and are wet-eyed to counteract the coarse-grainedness of the water.

2.14
Eyelashes and Hair

All animals with hair have eyelashes on their eyelids, while none of the birds and the hard-scaled animals do; for they do not have hair. (As regards the Libyan ostrich we will in fact state the cause later;[102] for this animal does have eyelashes.) And among those with hair, only the human beings have eyelashes on both eyelids. For the four-footed animals do not have hair on their underneath parts, but rather on their back parts, while the human beings, on the contrary, have it more on their underneath parts than on their back parts; for it is for the sake of a covering that hair is present in those animals that have it. In the four-footed animals, the back parts have a greater need for a covering, and though their front parts are more estimable, yet they are smooth,[103] because the animals are bent [forward]. But in the human beings, since, because of their upright stance, the front parts and back parts are evenly matched, nature has traced out[104] an aid to the more estimable parts; for it is always a cause of the better from among the possibilities.

That is also why none of the four-footed animals has a lower eyelash, although in some a few hairs grow under the lower eyelid; nor do they have hair in the armpits or the pubic region, as the human beings do. But, in place of these things, some are covered with hair on the entire back part of their body, as the dog kind is, while some have a crested mane, like the horses and the animals of this sort, and others have a mane, like the male lion.

Further, in those with long tails, nature has adorned them too with hair, long in the case of those with a short stump, like the horses, short in the case of those with a long stump, and in accord with the nature of the rest of the body; for everywhere

102. 4.14.
103. Reading ἀλλὰ λεάζει.
104. 654ᵃ24–26.

nature gives what it takes from somewhere else to another part. In those cases where it has made the body very hairy, the parts around the tail are in want of hair, as, for example, in the case of the bears. **$658^{b}1$**

With respect to the head, the human being is the hairiest of the animals, on the one hand, of necessity, due to the wetness of the brain and due to the sutures (for where there is most wetness and heat, it is necessary for the outgrowth to be greatest), on the other hand, for the sake of protection, so that it may provide a covering, protecting against both excessive cold and excessive heat. And since the human brain is the largest and the wettest, it is also most in need of this protection; for what is wettest boils and freezes most easily, while what is in the contrary condition is less easily affected.

But concerning these matters, the digression resulted from their connection with the causes of the eyelashes, due to their kinship with these, so that as regards the rest, mention must be made on the proper occasions.[105]

2.15
Eyebrows

The eyebrows and the eyelashes are both for the sake of protection, the eyebrows for liquids running downward, so that, like eaves, they may protect the eyes from liquids coming from the head, the eyelashes for the sake of [protection against] things striking against the eyes, like the palisades that some people build in front of fortresses. The eyebrows are at the composition-point of bones, and that is why they become bushy in many cases as people age, so that they need to be trimmed. The eyelids, though, are at the limits of small blood vessels; for where the skin comes to an end, the small blood vessels have the limit of their length. So, because the wet secretion coming out is corporeal, unless some work of nature hinders it for another use, it is necessary, also due to a cause of this sort for hair to occur of necessity in these places.

2.16
The Nose

In all the other four-footed live-bearing animals, the organ of smell does not differ in too far a way from one to another, but among all those with elongated jaw-bones, the so-called snout is the part in which the nostrils are present, in accord with the way that is possible, while in the others the nostrils are more separated from the jaws.

105. *HA* $498^{b}10$–$499^{a}12$, *GA* 5.3–5.

The elephant, however, has the most special part of this sort in comparison to the other animals; for both in size and capacity it is extraordinary. For the nostril[106] is that by which it draws—using it just like a hand—both dry and wet nourishment toward its mouth, and, by wrapping it around them, pulls up trees, again using it just like a hand. For the animal is in nature at the same time a frequenter of marshes and terrestrial, so that when it happens to get its nourishment in the water, while it is necessary for it to breathe (since it is a blooded terrestrial animal), and since it is unable to make the change from liquid to dry as quickly as some of the live-bearing blooded animals do (for its size is excessive), it is necessary for it to use the water as it does the land. In the same way, then, as some divers provide themselves with instruments for breathing, in order to remain in the sea for a long time by drawing in air from outside the liquid through the instrument, so nature makes the length of the nostril something of this sort for the elephants. That is why they breathe by lifting their nostril up out of the water whenever they make their journey through liquid; for as we said, the elephant's proboscis is its nostril.[107]

But since it is impossible for there to be a nostril of this sort if it is neither soft nor able to bend (for its length would impede taking in nourishment from outside, just as they say[108] the horns do in the backward-feeding oxen; for they say that these graze by going backward, rump foremost), such a nostril is present in elephants (nature, as is its custom, uses the same parts for many additional purposes) in place of using the front feet. For the many-toed four footed animals have front feet in place of hands, and not only for the sake of supporting their weight. And the elephants are among the many-toed ones, that is, they are neither cloven-hoofed nor solid-hoofed. But since the size and weight of their body are great, because of this their feet are only for the sake of support, and because of their slowness and their natural unfitness for bending, they are useless for anything else.

The elephant has a nostril, then, because of breathing, just as each of the other animals with a lung also does, but because it spends time in what is wet, and its moving out from there is slow, its nostril can be rolled up and is long; but because it has been deprived of the use of its [front] feet, nature, as we said,[109] also uses this part for the aid that would have been produced by the feet.

The birds, the snakes, and the other blooded egg-laying four-footed animals, though they have the ducts of the nostrils in front of the mouth, and so-to-speak nostrils, they do not have any that are manifestly distinct, except in virtue of their work. The bird, at any rate, has no nose at all to speak of. This has come about because in place of jaws it has the so-called beak. The cause of these things is that the nature of the birds was composed in this way. For they are both two-footed and winged, so that it is necessary for their neck and head to have little weight, just as it also is for their chest

106. I.e., the trunk.
107. *HA* 497ᵇ26–30.
108. Herodotus 4.183.
109. 659ᵃ21–29.

to be narrow. In order, then, for it to be useful both for strength and for nourishment, the beak they have is bony, while it is narrow because of the smallness of their head. In the beak they have the ducts for smell, but to have nostrils is impossible.

As regards the other animals, the non-breathing ones, the cause of their not having nostrils was stated previously,[110] but some perceive odors through their gills, others through their pipe,[111] while the insects do so through their diaphragm. And all of them smell, just as they move, by means of their innate breath; for this is present in all by nature and is not brought in from outside.

Below the nostrils is the nature of the lips in those blooded animals that have teeth. In the birds, in fact, as we said,[112] for nourishment and strength, their beak is bony; for it has been brought together into one thing in place of teeth and lips, just as if, having removed the lips from a human being and joined together the upper teeth and the lower teeth separately, one were to elongate their length, making them narrow on both sides; for this would already be a bird-like beak.

In the other animals, the nature of the lips is for the preservation and protection of the teeth, which is why, as their teeth share in what is exact and correct or the contrary, so too they have distinct sorts of lips. The human beings have lips that are soft, fleshy, and able to separate, both for the sake of protecting the teeth, as with the other animals, but yet more so for the good; for these are also used for speech. For just as nature made the human tongue unlike those of the other animals, using it for doing two works (as we say it does in many cases), for the sake of both flavors and speech, it has made the lips both for the sake of speech and for the protection of the teeth. For speech that is by means of the voice is composed of articulate sounds, and if the tongue were not of the sort it is or the lips not wet, most of the articulate sounds could not be uttered; for some involve applications of the tongue, others applications of the lips.[113] But of what sorts these are, how many they are, and what differences they exhibit must be learned from practitioners of the craft of versification.

It follows that it is necessary from the outset for each of these parts to be serviceable for the use mentioned and to have a nature of the sort it does; that is why they are fleshy. But the flesh that is present in the human beings is softest. This is because they are the most perceptive of the animals with respect to perception by means of touch.

2.17
The Tongue

The tongue in animals is under the roof of the mouth, and is pretty much the same in all the terrestrial animals, while in the other animals it is not the same, both

110. $656^{a}33$–37, *HA* $589^{b}13$–22.
111. Reference unclear.
112. $659^{b}10$.
113. *Po.* $1456^{b}25$–31.

compared to each other and compared to the terrestrial animals. The human being has the most detached, softest, and broadest tongue, in order that it be useful for doing both its works: it is useful for the perception of the flavors (for the human being is the sharpest perceiver among the various animals, and his tongue is soft; for it is, tactilely, the most perceptive, and taste is a sort of touch), and his soft and broad tongue is also useful for the articulation of the articulate sounds, that is, for speech; for it is most able to draw in and stick out in all sorts of ways, since it is soft, broad, and detached. This is clear in those in whom it is not very detached; for they speak inarticulately and lisp, and this comes from a want of letters.

In what is broad, the narrow is also included; for the small is present in the great, but not the great in the small. That is why, among the birds, those most able to utter articulate sounds have broader tongues than the others.

The blooded live-bearing four-footed animals have little articulation in their voice; for they have a tongue that is hard, not detached, and thick. Some of the birds, though, have many voices, and the crooked-taloned ones have broader tongues. The smaller ones have many voices. And though all use their tongue to communicate with each other, some do so more than others, so that in some cases they even seem to be learning from each other. These things have been spoken about in the *History of Animals*.[114]

Among the terrestrial egg-laying blooded animals, most have a tongue that is useless for doing the work of the voice, attached and hard as it is; but for the tasting of flavors, the snakes and the lizards have a long divided tongue; the snakes have so long a tongue that it can be extended from small to great, and a divided one, with a thin hair-like tip, because of their gluttonous nature; for it gets a double pleasure from flavors, as if having a double perceptual modality of taste.

Both the bloodless and all the blooded animals have the part capable of perceiving flavors; for even those that seem to most people not to have one, like some of the fishes, in a way have a rudimentary one, and one pretty much the same as in the river crocodiles. But most of these do not appear to have it due to a reasonable cause; for the place of the mouth is spinous in all these animals, and because there is little time for the perception of flavors in the aquatic animals, and as the use of the tongue is slight so too is its articulation. The passage of nourishment to the stomach is quick because they cannot spend time sucking out the juice;[115] for water would get in. So unless one pulls their mouth open, the tongue does not appear to be a separate part. And this place is spinous; for it is composed by the contact of the gills, which have a spinous nature.

In the crocodiles, having an immovable lower jaw also contributes something to the disablement of this part. For their tongue is attached to the lower jaw, and they have the upper and lower jaws, as it were, inverted; for in the other animals it is the

114. 4.9.

115. That embodies flavor.

upper jaw that is immobile. They do not have their tongue attached to the upper jaw, because it would be contrary to the entrance of nourishment, but to the lower one, because it is like the upper one transposed. And further, though it is a terrestrial animal, it lives the life of the fishes, so that because of this too it is necessary for it to have this part unarticulated.

Many of the fishes also have a roof of the mouth that is fleshy, and some of the river fishes have one that is very fleshy and soft, for example, the ones called the "carps," so that, to those who do not investigate in an exact way, they seem to have a tongue there. But the fishes, due to the cause mentioned,[116] do have a tongue, though the articulation of their tongue is not evident. And it is for the sake of the nourishment found in flavors that this tongue-like part contributing to perception exists; but it is not equally perceptive everywhere, but mostly in the tip, which is why in the fishes only this part is separated.

All the animals have an appetite for nourishment, since they have perception of the pleasure that arises from nourishment; for appetite is for pleasure. But the part by which the perception of nourishment is produced is not the same in all: in some it is detached, while in others it is attached, namely, in all the ones in which no work for a voice is present; and in the latter it is hard, while in the former it is soft and fleshy. That is also why in the soft-shelled animals—for example, the crabs and animals of this sort—something of this sort is present inside the mouth, and also in the soft-bodied ones—for example, the cuttlefishes and the octopuses.

Among the insects, some have a part of this sort inside—for example, the ant kind—and, in like manner, many of the hard-shelled animals; others have it outside, like a sting, soft in nature and hollow, so as to taste and draw in nourishment with it at the same time.[117] This is clear in the case of the flies and the bees, and all the animals of this sort, and further, in the case of some of the hard-shelled animals; in fact, in the purpuras this part has so great a capacity that it can pierce the shells of the mussels, like the spiral-shelled ones people use as bait to catch them. Further, the gadflies and the horseflies pierce the skin, in the one case, of the human beings and, in the other, that of the other animals too. In these animals, then, the tongue is of such a nature as to be like a counterpart to the nostril of the elephants; for in the elephants the nostril is for the sake of protection, and in these the tongue takes the place of a sting.

But in the case of the other animals the tongue is altogether as we said.

116. 660^{b}11–14.
117. 678^{b}13–18.

BOOK 3

3.1
The Teeth

Coming next after what has been said is the nature of the teeth in animals, and the mouth that is encompassed by them and composed of them. In animals other [than the human being], the nature of the teeth has a common work, that on the nourishment, and a separate work, that with respect to kinds: in some it is present for the sake of strength, this being divided into that for attack and that for defense; for some animals have teeth for the sake of both, both for defense and for attack—for example, those wild animals that are carnivorous in nature; while others have them for the sake of protection, as many of the wild and the tame animals do.

The human being has teeth naturally well composed for the common use, the front ones sharp in order to cut, the molars broad in order to grind. The canines, which are in nature intermediate between the two,[118] divide these from each other; for the intermediate participates in both extremes, and the canines are in a way sharp and in a way broad. It is the same way too in the case of all the other animals that do not have all their teeth sharp. But it is especially for speech that the human being has these sorts of teeth and this many of them; for the front teeth contribute greatly to the generation of articulate sounds.

Some animals have teeth, as we said,[119] for the sake of nourishment alone. But among all those that have them for protection and also for strength, some have tusks, for example, the pig, while others have sharp interlocking teeth, hence they are called "sawtoothed." For since it is in their teeth that their strength lies, and this is produced due to their sharpness, rows of teeth that are useful for strength fit together one into the other, in order not to get blunted by rubbing against each other. And none of the animals is both sawtoothed and tusked, because nature produces nothing pointless or superfluous; but, for some, protection is by means of striking, for others, by means of biting. That is why female pigs bite; for they do not have tusks.

But one must grasp a universal point, one that will be useful both in the case of these matters and in the case of many of the ones that will be spoken about later. Among the instrumental parts that are for strength and protection, nature gives each of them only or more so to those capable of using them, and mostly to those most capable—for example, a sting, a spur, horns, tusks, and any other part of this sort there may be. And since the male is stronger and more spirited, in some cases he alone has parts of this sort, in others more so. For all those parts that it is necessary for the females too to have—for example, those for nourishment—they do have, though

118. *HA* 501b16–19.
119. 661b1.

they have them less, while those that are for none of the necessities, they do not have. And that is why the males among the deer have horns, while the females do not have them. The horns of the female cows and of the bulls differ too, and likewise with the sheep. Also, while the males have spurs, the majority of the females do not. It is the same way too in the case of the other parts of this sort.

All the fishes are sawtoothed except the one called the "parrot wrasse"; many also have teeth both on their tongue and on the roofs of their mouths. The cause of this is that it is necessary, since they are in liquid, to take in liquid at the same time as nourishment, and to dispatch the liquid quickly. For it is not possible for them to spend time grinding up the nourishment, since the liquid would flow into their stomach. That is why all their teeth are sharp for cutting. Again, they have many of them in many places in order that, in place of grinding up the nourishment, they can cut it into many pieces due to their large number. And they are curved because it is in the teeth that pretty much all their strength is due to them.

The animals also have the nature of the mouth both for the sake of these works, and further, for the sake of breathing, that is, all the ones that breathe and cool themselves from outside. For nature intrinsically, as we said,[120] puts the parts common to all animals to many special uses—for example, in the case of the mouth nourishment is common to all, while strength is special to some and speech to others, and further, breathing is not common to all. But nature has brought all these uses together into one part, producing a difference in this part for the differences in its work. That is why some have narrower mouths, others wider mouths. For all those that are for the sake of nourishment, respiration, and speech are narrower, while among those that are for the sake of protection, all the sawtoothed ones open wide. For since the animal's strength lies in biting, it is useful for the opening of its mouth to be large; for it bites with more teeth over a greater area to the extent that it opens its mouth wider. Among the fishes, the biting and carnivorous ones have a mouth of this sort, while those that are not carnivorous have a tapering one; for a mouth of this sort is useful for them, while the other sort would be useless.

In the birds the so-called beak is their mouth; for they have this in place of lips and teeth. It differs with respect to uses and protections. For the ones called "crook-taloned," because they are carnivorous and eat no seed, all have crooked beaks; for a beak of this sort is naturally useful for mastering prey and better at applying force. But their strength lies both in this part and in their talons; that is why they also have talons that are more crooked.

In each of the other birds the beak is useful for their mode of life—for example, in the woodpeckers it is strong and hard, and in the crows and the crow-like birds, while in the small birds it is thin for collecting seeds and grasping small animals. All those that are herbivores and all those that live around marshes, such as those that are swimmers and web-footed, though some have a beak that is useful in another

120. 659^a21, $^b35$.

way, others are broad-beaked; for by being like this it is able to dig easily, just like, among the four-footed animals, the snout of the pig; for the pig too is a root-eater. Further, the root-eating birds, and some of those with similar modes of life, have the extremities of their beaks serrated; for, since they are herbivores, beaks of this sort make things easier.

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The other parts of the head, then, have pretty much been spoken about, but, in the human beings, the one that is between the crown of the head and the neck is called the "face (*prosôpon*)," being named after its action, as it seems; for because the human being alone among the animals is upright, it alone sees from afar (*prosôthen opôpe*) and transmits its voice forward (*to prosô*).

3.2
The Horns

The horns must now be spoken about; for these too, in those that have them, are naturally on the head. No non-live-bearing animal has horns. By way of similarity, however, and by extension certain other sorts are also said to have horns; but in none of them is the work of the horn present. For it is for protection and strength that the live-bearing animals have horns, which is not the case for any of the other animals that are said to have horns. For none of them uses their horns either for protection or for mastery, which are precisely the works of strength.

None of the multi-split-footed animals has a horn. The cause of this is that the horn is a cause of protection, while other means of defense are present in the multi-split-footed animals; for to some nature has given claws, to some teeth for fighting, and to others some other part adequate for defense.

Among the cloven-hoofed animals, many have horns for strength, as do some of
663a1 the solid-hoofed ones, while some have them also for protection. But to those that do not have them, nature has given another [sort of] strength for preservation—for example, bodily swiftness, like that given to horses for protection, or size, like that given to camels. For excessive size is also sufficient to prevent destruction by other animals; this is precisely what happens in the case of camels, and yet more so in that of the elephants. The animals with tusks—as, for example, the pig kind—are cloven-hoofed.

To those for which prominent horns are naturally useless, nature has added another means of protection—for example, swiftness to the deer (for their size and their many branches harm more than benefit them), and to the antelope and the gazelle (for against some they stand their ground and defend themselves with their horns, while from those that are savage and pugnacious they flee); and to the bison (for in these the horns are naturally bent toward each other) nature has added the

emission of residue; for with this they defend themselves when frightened.[121] And by means of the same sort of emission other animals also preserve themselves. But nature has not given to the same animals means of protection that are at the same time sufficient and many.

Most of the horned animals are cloven-hoofed, but there is also one said to be solid-hoofed, which they call the "Indian ass." Most of the animals, then, just as they have a body that is divided into two parts by which they produce movement, right and left, also naturally have two horns, due to the same cause. There are also one-horned animals—for example, the oryx and the one called the "Indian ass." But while the oryx is cloven-hoofed, the ass is solid-hoofed.

The one-horned animals have the horn in the middle of the head; for in this way each of its parts can most of all have one horn; for the middle is equally common to both of the extremes. It would seem reasonable for the solid-hoofed animals to be one-horned rather than the cloven-hoofed ones; for hoof and nail have the same nature as horn, so that the division of the hooves and horns occur at the same time and in the same animals. Further, the division—that is, the cloven-hoof—is present in virtue of a deficiency of the nature, so it is reasonable that, in the case of the solid-hoofed animals, nature, since it had provided an excess in the hooves, withdrew it from up above and made them one-horned.

Nature also proceeded correctly in placing the nature of the horns on the head, and not like Aesop's Momus, who greatly blames the bull because it does not have its horns on its shoulders, the place from which it would have produced the strongest blows, but on the weaker part of the head. For Momus was not seeing sharply when **$663^{b}1$** he made this criticism. For just as if horns grew naturally somewhere else on the body, they would supply weight while being otherwise of no use at all and even an impediment to many of its works, they would also be that way if they grew naturally on the shoulders. For not only must one investigate from which place the blows would be stronger, but also from which one they would strike things further away. So, since bulls do not have hands either, and for horns to be on the feet is impossible, and on the knees they would prevent them from bending, it is necessary that they have them just as they now do, on the head. At the same time too, in this way they are naturally the least an impediment for the other movements of the bodies.

The horns are solid throughout only in the deer, and they alone shed them, on the one hand, for benefit of being relieved of a burden, and, on the other, of necessity, because of their weight. The horns of the other animals are hollow up to a certain point, but their extremities are solid because they are useful for striking blows. But in order for not even the hollow part to be weak, the horn grows naturally from the skin, and into it a solid part from the bones is inserted; for in this way the possession of horns is both most useful for strength and least an impediment to the rest of their mode of life.

121. *HA* $630^{b}8$–13.

What the nature of the horns is for the sake of, then, has been stated, and due to what cause some animals have parts of this sort, while others do not; but since there is a necessary nature, we must now say how the nature that is in accord with the account uses the things present of necessity for the sake of something. First, then, what is corporeal and earthen is present in larger quantities in the larger animals, while we know of no horned animal that is altogether small; for the smallest one known is the gazelle. One must, though, get a theoretical grasp on nature by looking to the many; for it is what holds in all cases or for the most part that is in accord with nature. What is bony in the bodies of animals is earthen; that is why, in fact, it is present in the largest quantities in the largest animals, to speak so by having looked at what holds for the most part. At any rate, the residue-like excess of this sort of body, since it is present in the larger ones among the animals, is used by nature for protection and advantage, and its flow is of necessity to the upper place,[122] in some cases assigned to teeth and tusks, in others to horns. That is why none of the horned animals has two rows of teeth; for they do not have upper front teeth; for nature takes away from there and adds to the horns—that is, the nourishment [otherwise] given to these teeth is used up in the growth of the horns.

Female deer do not have horns, but as regards the teeth they are like the males; the cause of this is that they are both of the same nature, that is, horned. But the horns have been taken away from the females because, though they are not useful even to the males, the males, because of their strength, are harmed less by them.

Among the other animals in which a part of the body of this sort is not formed into horns, in some cases nature has increased the size of all of their teeth in common, while in some it has produced tusks, like horns coming from their jaws.[123]

3.3
The Neck and Its Parts

As regards the parts in the head, then, let them be defined in this way, and naturally under the head is the neck, in those animals that have a neck. For not all animals have this part, but only those that have the parts that the neck is naturally for the sake of; these are the larynx and the so-called esophagus.[124]

The larynx is naturally for the sake of the breath; for it is through this that the animals draw in the breath and expel it when inhaling and exhaling. That is why those that do not have a lung do not have a neck either—for example, the fish kind.

122. Because the upper part of the large quadrupeds that have teeth or horn for protection is bent forward (658ᵃ22), the flow of the earthen material to it is actually downward, as is necessary.

123. External parts are returned to in 4.6.

124. *HA* 495ᵃ18–20.

The esophagus is that through which the nourishment proceeds to the stomach; so all those that do not have a neck obviously do not have an esophagus either. But it is not necessary to have the esophagus for the sake of nourishment; for it provides nothing for it. Further, it is possible for the stomach to be placed right next to where the mouth is situated, while for the lung this is not possible. For, since it is bipartite, there must be something common, like a pipe, in virtue of which the breath is divided by way of the windpipes into the bronchial passages; and in this way the lung can best accomplish inhalation and exhalation. And since this instrument having to do with breathing of necessity has length, it is necessary for there to be the esophagus between the mouth and the stomach. The esophagus, for its part, is fleshy, with a sinewy elasticity: sinewy, in order that it have the capacity to stretch when nourishment enters; fleshy, in order to be soft, to be able to yield, and not harmed when it is abraded by the nourishment going down.

The part called the "larynx" and the windpipe are composed of cartilaginous body; for they are not only for the sake of breathing, but also for the sake of voiced sound, and what is going to make a sound must be smooth and hard.[125] The windpipe is situated in front of the esophagus, although this impedes it in the reception of nourishment; for if something either dry or wet slips imperceptibly into the windpipe, it produces choking, distress, and violent coughing. This should surely be a cause of wonderment to any of those who say that it is by means of this part that the animal takes drink; for the things mentioned visibly occur in every case in which some of the nourishment slips in. But, on many grounds, it is manifestly ridiculous to say that animals take in drink in this way. For there is no duct into the stomach coming from the lung like the esophagus we see coming from the mouth. Further, in cases of vomiting and seasickness, it is not unclear where the liquid is visibly flowing from. It is also clear that the liquid is not from the outset collected together in the bladder, but rather beforehand in the stomach; for the sediment of red wine appears to color the residues from the stomach; and it turns out that this is often evident also in cases of wounds to the stomach. But it is perhaps, in fact, foolish to overly examine foolish accounts.

The windpipe by being situated, as we said,[126] in front is given trouble by the nourishment; but for this nature has devised the epiglottis. Not all the live-bearing animals have this part, but rather all the ones that have a lung and their skin hairy, and that are naturally neither hard-scaled nor feathered. In those that are hard-scaled or feathered, in place of the epiglottis the larynx contracts and opens, in precisely the way that in the other animals the epiglottis shuts and opens, opening for the entrance and exit of the breath, closing when the nourishment is entering, in order that nothing slip into the windpipe. But if some false note is struck during this sort of movement and someone inhales while taking nourishment, this produces coughing

125. *DA* 2.8.
126. $664^{b}2–3$.

and choking, as was said.[127] In this way the movement both of the epiglottis and the tongue has been so well contrived that when the nourishment is being ground up in the mouth, and is traversing the epiglottis, the tongue seldom falls under the teeth, and it is rare for something to slip into the windpipe.

The animals mentioned[128] do not have the epiglottis because their flesh is dry and their skin hard, so that a part of this sort would not move easily in them, since it is composed of flesh of this sort and skin of this sort, but rather the contraction of the extremities of the windpipe itself occurs as quickly as an epiglottis composed of the proper flesh, which the animals with hair have.

Due to what cause some animals have the epiglottis and others do not, let these be as stated, and also why nature has remedied the badness in the position of the windpipe by devising the so-called epiglottis.

The larynx is situated in front of the esophagus of necessity. For the heart is situated in the front and in the middle—in which part, we say,[129] the starting-point of life and of all movement and perception lies (for perception and movement are toward the so-called front; for it is by this very account that the front and the rear are defined[130])—and the lung is situated where the heart is, that is, around it, and breathing is produced because of this and because of the starting-point being present in the heart.

Breathing, for its part, is produced in the animals through the windpipe; so, since it is necessary for the heart to be situated first among the things in front, it is also necessary for the larynx and the windpipe to be situated in front of the esophagus; for while the former parts extend to the lung and the heart, the esophagus extends into the stomach. And, in general, where nothing else more important impedes it, what is better and more estimable is always, in the case of the above and the below, found more among the things above, and in the case of the front and the rear, more among things in front, and in the case of the right and the left, more among things on the right.[131]

3.4
The Viscera

The neck, esophagus, and windpipe having been spoken about, the next thing to speak about is the viscera. These are special to the blooded animals, and while all are present in some, in others not all are present. None of the bloodless animals has viscera. Democritus seems not to have grasped these things well, if indeed he thought

127. 664b4–6.
128. Those that are hard-scaled or feathered.
129. 647a24–30.
130. *IA* 705b8–13, *Cael.* 284b30–285a10.
131. *IA* 706b11–16.

that, because of the smallness of the bloodless animals, these parts are invisible. For as soon as the blooded animals are composed, and while they are altogether small, both heart and liver become visible. For they are sometimes evident in three-day-old eggs, while they are the size of a point, and very small ones are also evident in aborted fetuses. **$665^{b}1$**

Further, just as with the external parts not all animals have been provided with a use for the same ones, but rather to each a special one has been provided in relation to its mode of life and movements, so it is also natural for the internal parts to be distinct in distinct ones. The viscera are special to the blooded animals, which is also why each of them is composed of bloody matter. This is clear in their newborns; for their viscera are more bloodlike and proportionally largest due to the form of the matter and its quantity being most evident at the moment of the first composition.

A heart is present in all blooded animals; the cause of this was also spoken about previously.[132] For it is clear that it is necessary for the blooded animals to have blood; and since blood is a liquid, it is necessary for a container to be present, for which purpose, in particular, nature appears to have devised the blood vessels. But it is necessary for there to be a single starting-point of these; for wherever possible, one starting-point is better than many. And the heart is the starting-point of the blood vessels; for they manifestly come from the heart and do not go through it, and its nature is blood-vessel-like, as it is of the same kind as them. Its situation is also in a place fitting for a starting-point; for it is around the middle [of the body], and more above than below, and more in front than in back; for nature places the more estimable thing in the more estimable places, where nothing more important prevents it. What has been said is most evident in the case of the human beings, but even in the other animals, the heart tends to be similarly situated in the middle of the necessary body. Of this, a limit is where the residues are secreted; but the limbs vary in various animals, and are not among the parts necessary for life, which is why when they are removed the animals continue living; and it is clear that their addition would not destroy them either.

Those who say that the starting-point of the blood vessels is in the head did not suppose so correctly. For, first, they produce many scattered starting-points; next, these are in a cold place. This is clear, for the head's place is sensitive to cold, while the place around the heart is the contrary. And as was said,[133] while the blood vessels go through the other viscera, no blood vessel extends through the heart; from this too it is clear that the heart is a part—in fact, the starting-point—of the blood vessels. And this is reasonable; for the middle of the heart is a body that is naturally dense and hollow, and further, full of blood, since the blood vessels start from there—hollow to be the receptacle of the blood, and dense to preserve the starting-point of the heat. **$666^{a}1$** For in this part alone of the viscera and the body is there blood without blood vessels,

132. $647^{a}24$–33.
133. $665^{b}15$–17.

while each of the other parts has its blood in blood vessels. This too is reasonable; for the blood is brought from the heart and into the blood vessels, but not to the heart from elsewhere; for this is the starting-point and[134] source of the blood, and its first receptacle. From the dissections these things are clearer, and from the generations;[135] for the heart, which is the first among all the parts that comes to be, is blooded from the outset.

Further, the movements of pleasures and pains and, in general, of all perceptions manifestly have their starting-points there and proceed to it. And this is also in accord with reason; for there must be a single starting-point wherever possible. And the middle is the naturally best disposed of places [for this]; for there is a single middle and accessible from all directions alike, or in much the same way. Further, since none of the bloodless parts is perceptual, nor is the blood, it is clear that the first thing that holds it as in a container is necessarily its starting-point. Not only does it appear to be this way in accord with reason, but also in accord with perception; for in fetuses, the heart is, among the parts, apparently moving from the outset, as if it were an animal, implying that it is a starting-point of movement in the blooded animals. Evidence for what has been said too is the heart's being present in all the blooded animals; for it is necessary for them to have the starting-point of the blood.

The liver is also present in all the blooded animals; but no one would claim it to be a starting-point either of the whole body or of the blood; for it is in no way situated near a position with the form of a starting-point, and it has, like a counterweight, in the most exactly realized animals, the spleen. Further, the liver does not have a receptacle for the blood within itself as the heart does, but like the rest, its blood is in a blood vessel. Further, a blood vessel extends through it, but through the heart none does; for the starting-points of all the blood vessels are from the heart. Since, then, it is necessary for one or the other of these to be a starting-point, and it is not the liver, it is necessary for the heart to be the starting-point also[136] of the blood. For the animal is defined by perception, the primary perceptual part is the primary blooded one, and the heart is a part of this sort; for it is, in fact, the starting-point of the blood and the primary blooded part.

666b1 The extremity of the heart is pointy and solider than the rest, and is situated toward the chest and, in general, in the front of the body, so as for the body not to become cold. For in all animals the chest is more fleshless and the back more fleshy, which is why their heat has a lot of covering in the back.

But while the heart in the other animals is in the middle of the chest's place, in the human beings it inclines a little toward the left, so as to balance the cooling of things on the left; for much more so than the other animals, the human being has left parts that are cold. That in the fishes too the heart is situated in the same way, and why it

134. Reading καὶ.

135. No clear reference to the *Dissections* and *Generation of Animals* seems intended.

136. As well as of the blood vessels.

appears not to be, was stated previously.[137] They have the point of the heart directed toward the head, but this is the front; for their movement is in this direction.

The heart has a great number of sinews, and this is reasonable; for the movements are from it and are effected by contraction and relaxation; it must, then, have equipment of this sort and strength.[138] And the heart, as we said previously,[139] in those that have it, is in nature like a sort of animal. It is boneless in all those that we have actually examined, except for the horses and a certain kind of oxen; in these, due to their great size, there is a bone underneath serving as support, as is also the case for their entire bodies.

The hearts of the larger animals have three cavities, those of the smaller ones two, and all have [at least] one, the cause due to which this is so was stated.[140] For there must also be some place within the heart that is a receptacle of the first blood; and that the blood is first produced in the heart we have said many times.[141] Because the starting blood vessels are two, the one called the "great" and the aorta (for each of these is a starting-point of the blood vessels; and they exhibit differences, which we will speak about later[142]), it is better for their starting-points also to be separated; and this would be so if the blood were different and separated. That is why, in those cases where it is possible, there are two receptacles. And it is possible in the large animals; for their hearts are also large. And it is yet better for there to be three cavities, in order for there to be one common starting-point;[143] and the middle is a starting-point and the odd;[144] so these hearts must always be larger, which is why only the largest hearts have three cavities.

Of these, the ones on the right have the most and the hottest blood (which is also why the parts on the right are hotter), those on the left have the least and the colder blood, while the intermediate ones have blood that is intermediate in quantity and heat, though it is purest; for the starting-point must be most at rest, and it will be like this when the blood is pure but intermediate in quantity and heat.

Hearts also have a sort of division much the same as the sutures [of the cranium].[145] They are not united, as something composed of many things, but, as we said,[146] are more due to articulation. The hearts of animals capable of perceiving are more articulated, while those of the more sluggish are more unarticulated, like those of the pigs.

137. *HA* $506^{b}33$–$507^{a}10$.
138. *MA* $702^{b}20$–25.
139. $666^{a}21$.
140. $666^{a}1$–2.
141. E.g., $647^{b}4$–7.
142. 3.5.
143. $665^{b}14$–15.
144. The middle point of a line is a starting-point of both equal (or even) segments and is odd because not divisible by 2.
145. $653^{a}37$–$^{b}3$.
146. In analogizing them to sutures.

The differences of the heart with respect to largeness and smallness, and hardness and softness, extend in some way even to the characters of animals. For the animals less capable of perceiving have a heart that is hard and dense, while those [more] capable of perceiving have a softer heart; and those with larger hearts are cowardly, while those with smaller or middle-sized hearts are more confident. For the affection occurring due to fear already exists in these animals, because the heat in their heart is not proportional (since it is small in quantity, it is weakened in large things), and because the blood is colder. Animals with large hearts are the hare, the deer, the mouse, the hyena, the ass, the leopard, the weasel, and pretty much all the others that are manifestly cowardly or due to fear are doers of mischief.

Things are much the same in the blood vessels and in the cavities of the heart; for large blood vessels and cavities are cold. For just as in a smaller and in a larger room an equal-sized fire heats less in the larger one, so it is too with the heat in these parts; for the blood vessel and the cavity are containers. Further, alien movements cool each of the hot things, while in more roomy places the breath[147] is greater, and has more strength; that is why none of those animals with large cavities or large blood vessels has fat in its flesh,[148] but rather all or most of the animals of this sort appear to have inconspicuous blood vessels and small cavities.

Alone among the viscera, and, in general, among the parts in the body, the heart does not withstand any severe affection, and this is reasonable; for when the starting-point has been destroyed, there is nowhere from which aid might come about for the other parts that depend on it. A sign of the heart not admitting of any affection is that in none of the sacrificial animals is any affection of this sort seen in it as in the other viscera. For the kidneys and the liver are often manifestly full of stones, growths, and abscesses, and the same for the lung, and above all the spleen. Many other affections are evident in these viscera, but they are least evident in the lung around the windpipe, and in the liver around the connection to the great blood vessel, and this is reasonable; for it is by this above all that they communicate with the heart. But all those animals that are manifestly dying due to disease, that is, due to affections of this sort, in these, when they have been dissected, morbid affections are evident around the heart.

As regards the heart, then, what sort of thing it is, what it is for the sake of, and the cause due to which it is present in those animals that have it, let this much be said.

147. Inhaled from the cooling environment.

148. It lacks the heat needed to concoct blood into fat (651[b]7–8).

3.5
The Blood Vessels

The next thing would be to speak about the blood vessels, both the great blood vessel and the aorta; for these are the first that receive the blood from the heart, while the remaining ones are offshoots of these. That they are for the sake of the blood, was stated previously;[149] for everything that is liquid has need of a container, the blood-vessel kind is a container, and the blood is in these; but why they are two and why being from one starting-point they extend throughout the entire body, we must now state.

The cause of their ending together in one starting-point and coming from one is that all animals have one soul capable of perceiving actively, so that the part primarily possessing it is also one, one potentially and actively in the case of the blooded animals, but in some of the bloodless ones, actively only.[150] That is also why it is necessary for the starting-point of the heat to be in the same place; and this is the cause both of the liquidity and the heat in the blood. Because, then, the starting-point capable of perceiving[151] and the starting-point of the heat are in one part, [the heat] of the blood also is from one starting-point, and because of the unity of the blood, the unity of the blood vessels too is from one starting-point. There are two blood vessels, though, because the bodies of the blooded animals that move by walking are bipartite; for in all these the front and the back, the right and the left, and the up and the down are distinguished. And by as much as the front is more estimable and more of a leader than the back, by that much is the great blood vessel more so than the aorta; for the former is situated in the front, while the latter is situated in the back, and it is evident that all the blooded animals have the former, though some have it indistinctly and others non-visibly. **668^{a}1**

The cause of the blood vessels being distributed throughout the entire body is that the blood is matter for the entire body (or in the bloodless animals its analog), and this is situated in the blood vessel (or its analog). As for how the animals are nourished, and from what, and in what way they take in the nourishment from the stomach, it is more fitting to investigate and speak about these in the *Generation of Animals*.[152] But since the parts are composed of blood, as we said,[153] it is reasonable that the flow of the blood vessels is naturally through the entire body; for the blood too must go through everything and beside everything, if indeed each of the parts is to be composed of it.

It seems that, just as in gardens irrigation systems are constructed going from one starting-point and source to many and ever many more channels, so as to give a share

149. $665^{b}9$–14.
150. *DA* $411^{b}19$–30, *Met.* $1040^{b}10$–16.
151. $653^{b}5$–8.
152. $740^{a}21$–$^{b}12$, $743^{a}8$–17.
153. $668^{a}3$.

of [water] to all, and in house-building stones are set beside the entire outline of the foundations, in the one case because the garden plants grow from the water, in the other because the foundations are built from the stones, in the same way nature too channels the blood through the entire body, since this is in nature matter for all of it. This becomes clear in those who are especially emaciated; for nothing else is evident besides the blood vessels, just as in grape leaves, fig leaves, and everything else of this sort; for when these leaves too have withered, only their veins[154] remain.

The cause of these things is that the blood (or its analog) is potentially body and flesh (or their analogs); just as, then, during irrigations the largest of the trenches remain, while the smallest are first quickly hidden by the mud, but when it is removed, they become evident again, in the same way too the largest blood vessels remain, while the smallest ones become actively flesh, though potentially they are no less blood vessels. That is also why when the flesh is preserved to any extent whatever, blood flows when it is cut; and further, though without a blood vessel there is no blood, yet no small blood vessel is visible, just as in irrigation systems the trenches are invisible until the mud has been removed.

The blood vessels always proceed from larger to smaller, until the ducts have become smaller than the coarse-grainedness of the blood; though passage through
668b1 them is impossible for the blood, it is possible for the residue of the liquid secretion, which we call "sweat," and this occurs when the body is overheated and the small blood vessels are dilated. And some cases have been observed where sweating resulted in a bloodlike residue because of unhealthiness, when the body becomes flaccid and open-structured, and the blood becomes watery due to lack of concoction, when the heat in the small blood vessels is unable to concoct the blood because of its littleness. For it has been said[155] that every combination of earth and water solidifies when concocted, and nourishment and blood are a mixture of the two of them. But the heat is unable to concoct it not only because of its littleness, but also because of the quantity and excess of the incoming nourishment; for the heat becomes less in relation to this. The excess is of two sorts; for it is both in quantity and in quality; for not all of it can be equally well concocted.

The blood flows most through the roomiest of the ducts; that is why from the nostrils, gums, fundament, and sometimes also from the mouth, painless hemorrhages are produced, not like those from the throat, which are violent.

The great blood vessel and the aorta, being separated above, but crossing each other below, hold the body together. For in proceeding, they divide in accord with the bipartition of the limbs, and the former proceeds from the front to the back, the latter from the back to the front, and they join the body together into one; for just as in things that are plaited together more continuity is found, so too by the blood vessels crossing each other the front of the body is united with the back. The same

154. Literally, "vessels."
155. 649a31–33, *Mete*. 383a13–25.

also happens in the upper places [to blood vessels] coming from the heart. But how exactly the blood vessels stand in relation to each other, one must observe with the help of the *Dissections* and the *History of Animals*.[156]

The blood vessels and the heart may be regarded as spoken about; but the other viscera must be investigated in accord with the same methodical inquiry.

3.6
The Lung

A certain animal kind has a lung because it is terrestrial. For it is necessary for its heat to be cooled, and the blooded animals need to be cooled from outside; for they are hotter. Those that are not blooded are able to cool themselves by their innate breath. It is necessary for cooling from the outside to be by means either of water or of air. That is why none of the fishes has a lung, but in place of this gills, as was said in the studies concerning respiration;[157] for the fishes cool themselves by means of water, while those that breathe do so by means of air, which is precisely why all those that breathe have a lung.

All the terrestrial animals breathe and some of aquatic ones do too—for example, the whale, the dolphin, and all the cetaceans that blow upward. For many animals have a nature that plays a double game, and some that are terrestrial and[158] take in air because of their body's blend spend most of their time in liquid, and some of those that live in liquid participate so much in the terrestrial nature that it is in their breath that the end of living lies.[159]

The lung is the instrument of breathing, deriving the starting-point of its movement from the heart, making plenty of room for the entry of the breath by its sponginess and size; for when it expands the breath flows in, and when it contracts the breath goes out again. It has been said[160]—incorrectly—that the lung is related to the leaping of the heart; for this palpitation happens only (one might say) in the human being, because hope and expectation of the future occur only in him; also in most animals the heart is in a place far distant from the lung and situated in a position higher up than it, so that the lung contributes nothing to the leaping of the heart.

The lung exhibits many differences in the animals. For some have a bloody and large one, others a small and spongy one. The live-bearing ones, because of the heat of their nature, have a large and blooded lung, while the egg-laying ones have a dry and small one, though it is able to open wide during inflation, as in the four-footed egg-laying terrestrial animals—for example, the lizards, the turtles, and every kind of

156. 3.2–4.
157. *Juv.* 16 (10), 18 (12), 22 (16).
158. Reading τῶν.
159. *Juv.* $480^{b}19$–20.
160. Plato, *Timaeus* 70c.

this sort, and further, in addition to these, those of a winged nature called "birds." For the lung of all these is spongy and like foam; for foam too from being large in volume becomes small when it is compressed, and the lung of these animals is small and membranous. That is why they are all thirst-free and drink little, and are able to live in liquid for a long time; for since they have little heat they can be sufficiently cooled for a long time by the lung's own movement, since it is airy and empty. And this tallies with these animals being smaller in size than the other animals, generally speaking; for heat is growth-productive; and abundance of blood is a sign of heat. Further, heat makes the bodies more upright, which is why the human being is the most upright of all, and the live-bearing animals the most upright of four-footed ones; for none of live-bearing ones, whether footless or going by foot, lives in holes [like the egg-laying ones].

In general, then, the lung is for the sake of breathing, but is bloodless and of such-and-such kind for the sake of certain animals;[161] but what is common to these is nameless, that is, it has no name like "bird" that applies to a certain kind of animal. That is why, just as the being for a bird is composed of something, so too having a lung is present in the substance of these animals.

3.7
The Liver and Spleen

Some of the viscera seem to be of a single nature, such as the heart and the lung, some to be of a double one, such as the kidneys, while some raise a puzzle as to which way they are. For it would appear that the liver and spleen play a double game with respect to these; for in a way each is of a single nature, and in another way, instead of each being one thing, they are two things with much the same nature. But, in fact, all the viscera are of a double nature. The cause of this is that the division of the body, though it is a double nature, contributes to a single starting-point; for there is the up and down, the front and back, the right and left. That is why even the brain tends to be bipartite in all animals, as well as each of the perceptual organs. In accord with the same account, the heart is bipartite too, in its cavities. The lung in the egg-laying animals is divided to such an extent that they seem to have two lungs. The kidneys, for their part, are clearly two in all cases.

As regards the liver and the spleen, though, someone might rightly raise a puzzle. The cause of this is that in those animals that of necessity have a spleen, the spleen would seem to be like a false liver, while in those that do not have one of necessity, but have an altogether small one as a token, the liver is clearly bipartite, one part tending to lie toward the right side, the smaller part toward the left. Nonetheless, even in the egg-laying animals, though it is less evident than in the latter animals,

161. I.e., for their breathing or survival.

in some cases the liver is noticeably divided even there, just as in some live-bearing animals—for example, the hares in some places seem to have two livers, as do some other fishes, especially the selachian-like ones. And it is because the position of the liver is more on the right that the nature of the spleen has come about, so that, while it is in a way necessary, it is not extremely necessary in all animals. **670^{a}1**

The cause, then, of the nature of the viscera being double, as we said,[162] is that the right and the left are two; for each seeks its like. And just as these [viscera] tend to be much the same and to have the nature of twins, and[163] just as those [sides], though they are twins, are joined together into one, it is also the same way for each of the viscera.

Viscera that are below the diaphragm are all in common for the sake of the blood vessels, in order that, though unsupported, they remain attached to the body, with these as bond of union. For they are just like anchor-lines, which have been thrown in the body through the extended parts, going from the great blood vessel to the liver and the spleen; for the nature of these viscera is to be like nails that fasten the great blood vessel to the body, while the liver and the spleen fasten it to the sides of the body (for the blood vessels extend from the great blood vessel to these parts alone), and the kidneys to the back. To each of the kidneys a blood vessel extends not only from the great blood vessel, but also from the aorta. These are the things, then, that result due to the viscera in the composition of the animals. The liver and the spleen also aid in the concoction of the nourishment (for since they are blooded they have a hot nature), while the kidneys aid in [collecting] the residue secreted into the bladder.

The heart and the liver are necessary to all animals, the heart because there must be a starting-point of the heat (for there must be something like a hearth, in which the vital spark of the animal's nature is situated, and this must be well protected, since it is, as it were, the acropolis of the body), the liver for the sake of concoction. All the blooded animals must have these two, that is why these two alone are viscera that all the blooded animals possess; but those that breathe have a third, the lung.

The spleen is coincidentally present of necessity, in those that have one, as are the residues, both the one in the stomach and the one around the bladder. That is why the spleen is deficient in size in some cases, as in all the feathered animals that have a hot stomach—for example, the pigeon, the hawk, and the kite; it is the same way in the egg-laying four-footed animals (for they have an altogether small one) and in many of the soft-scaled ones. These are precisely the ones that also lack a bladder, because the residue is directed through their open-structured flesh into feathers and soft scales. For the spleen draws off the residual wet secretions from the stomach, and is able to help concoct them, since it is bloodlike. But if the residue is too abundant or the spleen has a small quantity of heat, the [animals] become sickly from being full of nourishment; and because of the reflux of the liquid there, in many animals whose **670^{b}1**

162. 669^{b}18–21.
163. Reading καὶ.

spleen is sick the stomachs become hard, as with those animals that are inclined to urinate a lot, because their liquid has been drawn off.

In those animals that produce a small quantity of residue, like the birds and the fishes, some do not have a large spleen, while others have a token one. In the four-footed egg-laying animals the spleen is small, firm, and kidney-like, because their lung is spongy and they drink little, and because the surplus residue is directed to their body and their hard scales, just as it is to the feathers in the birds. In those that have a bladder and a blooded lung the spleen is wet, both due to the cause mentioned[164] and because the nature of things on the left side is generally wetter and colder. For each of the contraries has been placed by division in the column of things of the same kind—for example, right contrary to left and hot contrary to cold; and the columns are related to each other in the way mentioned.[165]

The kidneys are present in those that have them not of necessity, but for the sake of the well and the good;[166] for, in accord with their special nature, they are for the sake of the residue that collects in the bladder in those animals in which a greater quantity of this sort of sediment is produced, in order that the bladder do its own work better.

But since it is for the sake of the same need that animals are found to have the kidneys and the bladder, the bladder must now be spoken about by stepping over the next part in order; for nothing has yet been determined about the diaphragm, though this is one of the parts near the viscera.

3.8
The Bladder

Not all animals have a bladder, rather nature seems to wish to provide it only to those **671^a1** with a blooded lung, and reasonably only to them. For because of the excess of the nature[167] that they have in this part, these are the most thirsty of animals, and need not only more dry nourishment, but also more wet, so that of necessity more residue is produced, and not only as much as is concocted by the stomach and secreted with its own residue. It is necessary, therefore, for there to be something receptive of this residue as well. That is why those animals with a lung of this sort all have a bladder. Those that do not have a lung of this sort, but either drink very little because they have a spongy lung, or generally take in liquid for the sake not of drink but of nourishment (for example, the insects and the fishes), and further, those that are feathered, soft-scaled, or hard-scaled, because of the small quantity of liquid taken in and the

164. 670^b4.
165. I.e., the right and the hot are in the same column as are the left and the cold.
166. 640^a35–^{b}1, 645^a25–26.
167. I.e., the heat of the blood.

surplus residue being directed to these parts—none of these has a bladder, except for, among the hard-scaled animals, the turtles.

And there alone nature has been docked [in its operations]. The cause of this is that the sea turtles have a lung that is fleshy and blooded, like that of the cow, while the land turtles have one that is disproportionally large. Further, because the encompassing body is hard-shell-like and dense, the liquid does not dissipate through their open-structured flesh, like in the birds, the snakes, and other hard-scaled animals, so that so much sediment is produced that their nature must have some part that is receptive and container-like. This, then, is the cause due to which these are the only animals of this sort that have a bladder, the sea turtle a large one, the land turtles an altogether small one.

3.9
The Kidneys

It is the same way with the kidneys too. For none of the feathered, soft-scaled, or hard-scaled animals has kidneys either, except for the sea turtles and the land turtles; although—as if the flesh assigned to the kidneys had no place, but was dispersed to many places—there are flat kidney-like parts in some of the birds.

The freshwater turtle has neither a bladder nor kidneys; for because of the softness of its shell the liquid is easily evaporated. This, then, is the cause due to which the freshwater turtle has neither of these parts; but the other animals with a blooded lung, as was said,[168] are all found to have kidneys. For nature uses these at the same time for the sake of the blood vessels and for the secretion of the liquid residue; for a duct goes to them from the great blood vessel. **$671^{b}1$**

The kidneys all have a cavity, either large or small, except for those of the seal; these, being like those of the cows, are the most solid of all. The kidneys of the human beings are also like those of the cows; for they are, as it were, composed of many small kidneys and do not have a smooth surface like those of the sheep and the other four-footed animals. That is also why an infirmity of the kidneys in human beings is difficult to get rid of, once they get sick; for since it is as if they had many diseased kidneys, the treatment is more difficult than if one were diseased.

The duct that extends from the blood vessel does not terminate in the cavity of the kidneys, but is used up in the body of the kidneys; that is why blood is not found in their cavities, nor does it solidify there when the animals die. But from the cavities of the kidneys two sturdy bloodless ducts[169] go to the bladder, one from each of them, and other strong and continuous ones go to the kidneys from the aorta. These things are arranged in this way in order that from the blood vessel the residue of the liquid

168. $670^{b}32$–$671^{a}8$.
169. The ureters.

can travel to the kidneys, while from the kidneys the sediment produced from the filtering of the liquids can flow through the body of the kidneys into their center, where most of them have their cavity. That is also why they are the most foul smelling of the viscera. And from the center through these ducts something that is already more like a residue is secreted into the bladder. The bladder is suspended from the kidneys; for strong ducts, as was said,[170] extend to it. These, then, are the causes due to which the kidneys exist, and have the capacities mentioned.

In all the animals with kidneys, the right one is higher up than the left; for because their movement starts from the parts on the right, and because of this the nature of the parts on the right is stronger, all these parts must, because of the movement, tend in advance more upward, since they even raise the right eyebrow more and have it more arched than the left. And because the right kidney is drawn up higher, the liver is in contact with it in all these animals; for the liver is on the right.

672[a]1 The kidneys have the most fat of all the viscera, in part, of necessity, because the residue is filtered through the kidneys; in fact, the remaining blood, since it is pure, is easily concocted, and the end of well-concocted blood is fat and suet. For just as in dry things that have been burned, like ashes, some fire is left behind in them, so it is too in wet things that have been concocted; for some of the heat that did the work is left behind in them. That is why what is oily is light and rises to the surface in liquids. However, the fat is not produced in the kidneys themselves, because this viscera is dense, but surrounds them on the outside—fat in those animals that are fatty, suet in those that are suety; the difference between these was stated previously elsewhere.[171]

Of necessity, then, the kidneys come to be fatty due to this cause: from what happens of necessity in animals with kidneys. But they also come to be fatty for the sake of the preservation of the kidneys and their natural heat. For since they are outermost, they need more heat; for while the back is fleshy, so that it is a protection for the viscera around the heart, the loin is fleshless (for the bending-points of all animals are fleshless); in place of flesh, then, the fat becomes a shield for the kidneys. Further, they disaggregate and concoct the liquid better when they are fat; for what is oily is hot, and heat concocts.

It is due to these causes, then, that the kidneys are fatty, though in all animals the right one is less fatty. The cause of this is that the nature of the parts on the right is dry and more capable of movement; and movement is contrary [to being fatty]; for it melts the fat more.

For the other animals it is advantageous to have fat kidneys, and often they have their whole kidneys full of fat; although when a sheep is affected in this way, it dies. But even if the kidneys are very fat, nonetheless, there is some deficiency, if not in both, at least in the right. The cause of this happening only or most of all in the case of the sheep is that in fatty animals the fat is liquid, so that their outbursts of wind

170. 671[b]16, *HA* 497[a]11–13.
171. 2.5, *HA* 3.17–18.

do not cause trouble to the same extent by becoming enclosed. For this is a cause of gangrene; that is also why, among the human beings, those who suffer from pains in their kidneys, and even though it is advantageous for the kidneys to be fat, nonetheless if they become very fat, mortal pains result.

Among the other animals, the suet in the suety ones is less dense than in the sheep. And in its quantity the sheep greatly exceed other animals; for the sheep are **672^b1** the fastest of all the animals to become fat around the kidneys. When the liquid and the outbursts of wind become enclosed, then, the sheep are quickly done away with due to gangrene; for through the aorta and the blood vessel the condition makes its way directly to the heart; for there are continuous ducts from these blood vessels to the kidneys.

3.10
The Diaphragm

The heart and lung have been spoken about, then, also the liver, spleen, and kidneys.

These are separated from each other by the diaphragm. This diaphragm some people call the "midriffs"; it is what divides the heart and lung from the others. And in the blooded animals this diaphragm is called the "midriffs," as was just said. All the blooded animals have it, just as they do a heart and a liver. The cause of this is that it is for the sake of the division of the place around the stomach from the one around the heart, so that the starting-point of the perceptual soul will be unaffected and not be quickly overwhelmed by the exhalation coming from the nourishment and the large quantity of the heat brought in from outside. It is for this that nature established a division, making the midriffs like a partition wall or fence to divide the more estimable and the less estimable, in those animals in which it is possible to divide the upper and lower; for the upper is the for-the-sake-of-which and better, while the lower, the receptacle for the nourishment, is for the sake of it and necessary.

The diaphragm is fleshier and stronger toward the ribs, more membranous in the middle; for in this way it is more useful for strength and elasticity. As to why there are sorts of appendages against the heat from below, a sign is provided by what happens; for when, because of their proximity, the midriffs draw in the hot residue-like liquid, it right away noticeably disturbs thought and perception; that is why, indeed, they are called "midriffs (*phrenes*)," on the supposition that they participate in some way in thinking (*phronein*). In fact, they do not participate in it at all, but by being near to those things that do, they produce a noticeable change in thought. That is also why they are thin in the middle, not only of necessity (because, since they are fleshy, the parts of them that are toward the ribs are necessarily fleshier), but also in order that they participate as little as possible in the liquid secretion; for, since they are fleshy, they would retain and draw in much more secretion. **673^a1**

Another sign that the midriffs noticeably produce perception when quickly heated is also what happens in regard to laughter. For those who are tickled laugh quickly because of the movement that quickly arrives at this place, and, though heating but slightly, it nonetheless produces a noticeable effect and moves thought contrary to deliberate choice. The cause of the human being alone being ticklish is at once the thinness of his skin and the fact that the human being is the only one among the animals that laughs. And tickling is laughter caused by a movement of this sort in the part of the body around the armpit.

Laughter also results, they say, in connection with blows struck in battle to the place around the midriffs, due to the heat arising from the blow. Indeed, this comes from reports more trustworthy than the one about the human head that continues speaking after it has been cut off. For some people say, even invoking Homer, that it is because of this that he wrote, "and as *it* spoke his head was mingled with the dust" (not "as *he* spoke"[172]). In Caria this sort of thing was so thoroughly believed that one of the inhabitants was put on trial concerning it. For when the priest of Zeus the Warrior was killed, and it was unknown by whom, some people claimed to have heard the cut-off head saying many times, "Cercidas killed, man to man." That is why in fact, having searched for and found someone in the place whose name was "Cercidas," they put him on trial. But it is impossible to speak when the windpipe has been severed, and without movement coming from the lungs. And among the barbarians, where they cut off heads with alacrity, nothing of this sort has ever occurred. Further, due to what cause does this not occur in the other animals?

The report about laughing when the midriffs are struck makes perfect sense; for none of the other animals laughs. And that the body advances some distance after it has been separated from the head is not at all unreasonable, since the bloodless animals actually go on living for a long time. The causes of these things have been made clear elsewhere.[173]

What each of the viscera is for the sake of, then, has been stated. But they occur of necessity at the internal limits of the blood vessels; for it is necessary for a liquid secretion that is bloodlike to go out there, from which, once it has been condensed and solidified, the body of viscera is composed. That is why the viscera are bloody, and why the nature of their body is the same, and unlike that of the other parts.

3.11
The Membrane of the Viscera

All the viscera are in a membrane; for, for them to be unaffected, there must be a protection, and this must be light, and the membrane is in nature something of this

172. *Iliad* 10.457, *Odyssey* 22.329.
173. E.g., *DA* 411b19–27, 413b19–24, *HA* 531b30–532a5

sort; for it is dense so as to protect against the influx of liquid, fleshless so as not to draw in or retain liquid secretion, and thin in order to be light and not produce weight. The largest and strongest of the membranes are those around the heart and the brain, and this is reasonable; for these parts are in need of the most protection. For the protection is a protection around the controlling parts, and these parts most of all control life.

3.12
Differences in the Viscera (1)

Some animals have every one of the viscera, some do not have all; what sorts do not, and due to what cause, was stated previously.[174] But even among those that have them these parts differ; for the hearts are not the same in all animals that have a heart, and none (one might almost say) of the others is either.

For the liver in some animals is divided into many parts, while in others it is more of a single nature, first and foremost in the blooded live-bearing animals themselves; further, both in comparison to the former animals and in comparison to each other, the livers of the fishes and of the four-footed egg-laying animals differ more. The liver of the birds is most like the liver of the live-bearing animals; for its color is pure and bloodlike, just like theirs. The cause of this is that their bodies breathe freely, and do not have much inferior residue.[175] That is also why some of the live-bearing animals have no bile; for the liver contributes in large part to the good blend and health of the body; for the end of these viscera lies above all in the blood; and the liver is the most blooded of the viscera after the heart. The livers of most of the four-footed egg-laying animals and of the fishes are yellowish, and those of some are in fact altogether inferior, just as their bodies too have an inferior blend—for example, those of the toad, the turtle, and other animals of this sort.

The horned cloven-hoofed animals, like the goat, the sheep, and each of the others, has a round spleen, unless, because of the animal's magnitude, it grows more in length, as happens with the spleen of the cow. The multi-split-footed animals all have a long spleen—for example, the pig, the human being, and the dog; the solid-hoofed **674ᵃ1** ones have a spleen that is intermediate between, and a mixture of, these two; for it is in one part broad and in another part narrow—for example, the horse, the mule, and the ass.

174. 670ᵃ23–ᵇ31.

175. The presence of which in the blood would render it impure and darker.

3.13
Differences in the Viscera (2)

The viscera differ from the flesh not only in the bulk of their body, but also in that they are situated on the inside, not on the outside. The cause of this is that they have a nature that participates in [the nature of] the blood vessels, that is, some exist for the sake of the blood vessels, while others do not exist without the blood vessels.

3.14
The Stomach

Beneath the diaphragm is situated the stomach in animals; in those with an esophagus it is where this part ends; in those without one it is immediately next to the mouth; and following the stomach is the so-called intestine. The cause due to which each of the animals has these parts is evident to everyone. For it is necessary for the incoming nourishment to be received, for the nourishment that has been deprived of liquid to be expelled, and for the unconcocted nourishment and the residue not to be in the same place; and there must be also some place in which the nourishment is changed. For one part will hold the incoming nourishment, the other part the useless residue; and just as the time of each of these is distinct, it is necessary for them to be distinguished by their places too. But while the definition of these parts is more appropriate to the *Generation of Animals* and *On Nourishment*,[176] the differences of the stomach and of the contributing parts must be investigated now. For the animals have stomachs that resemble each other neither in their sizes nor in their forms.

All the blooded live-bearing animals with two rows of teeth have one stomach—for example, the human being, the dog, the lion, and all the other many-toed animals; all those that are solid-hoofed—for example, the horse, the mule, and the ass; and all those that, though solid-hoofed, have two rows of teeth—for example, the pig—except when, due to the magnitude of its body and the capacity of it nourishment, which is not easy to concoct, but instead is thorny and wood-like, the animal has more than one stomach—for example, the camel does, just like the horned animals. For the horned animals do not have two rows of teeth. And it is because of this that the camel, though without horns, does not have two rows of teeth either: because of the greater necessity of its having a stomach of this sort than having front teeth. So, since the camel has a stomach like the one of the animals without two rows of teeth,
674b1 it is also like them as regards its teeth, since these have no work. But at the same time, since its nourishment is thorny, and it is necessary for the tongue to be fleshy, nature uses the earth from the teeth for hardening the roof of the mouth.

176. 650b8–11.

The camel also chews the cud, just as the horned animals do, because it has stomachs like theirs. Each of these animals has several stomachs—for example, the sheep, the cow, the goat, the deer, and the other animals of this sort—in order that, since the service of the mouth is deficient as regards working on the nourishment because of the want of teeth, the stomachs receive the nourishment one after the other: the first unworked up, the next more worked up, the next altogether worked up, the last ground up. That is why animals of this sort have several places and parts. These are called "stomach," "net," "vase," and "reed." The way these parts are related to each other in their position and forms must be observed with the help of the *History of Animals* and the *Dissections*.

Due to the same cause, the bird kind also exhibits difference as regards the part that is receptive of the nourishment. For since they also do not fully do the work of the mouth (for they are toothless and have nothing with which to cut up or grind up the nourishment), because of this some birds have a so-called crop in front of the stomach in place of the working of the mouth; some have their esophagus broad, either as a bulky part of it in front of the stomach, in which to store the unworked-up nourishment, or else as a projecting part of the stomach itself; and some have the stomach itself strong and fleshy so as to be able to store the nourishment for a long time and to concoct it although it is not ground up; for by the capacity and heat of the stomach nature makes up for the deficiency of the mouth. But there are some birds that have none of these things, but rather a long crop, all the ones that are long-legged and live in marshes, because of the wetness of their nourishment. The cause of this is that the nourishment for all these birds is easily ground up, so that it follows because of these things, because of the lack of concoction and the [sort of] nourishment, that the stomachs of these birds are wet.

The fish kind has teeth, and pretty much all of them, one might say, are saw-toothed; for one small kind is not like this, namely, the so-called parrot wrasse, which seems indeed to be the only one to chew the cud, and this is reasonable because of this; for the horned animals without two rows of teeth also chew the cud. All the fishes have sharp teeth, so that they are able to cut up nourishment, though they cut badly; for they cannot spend the necessary time. That is why they neither have broad teeth nor are able to grind up nourishment: it would be pointless to have them. **675^{a}1**

Further, as for a gullet, some fishes do not have one at all, while others have a short one. But to aid with concoction some fishes have stomachs that are bird-like and fleshy—for example, the mullet; but many have appendages densely packed together next to the stomach, in order that by storing it in these, as if in reservoirs, they can decompose and concoct the nourishment. The fishes, though, have these appendages in a contrary way to the birds; for the fishes have them up near the stomach, while in the birds that have appendages they are down near the end of the intestine. Some live-bearing animals also have some intestinal appendages down below due to the same cause.

The entire fish kind—because the parts having to do with working on the nourishment are so deficient that they excrete it unconcocted—is gluttonous for nourishment, and so are all the other animals that have a straight intestine. For since the excretion occurs quickly, and because of this their enjoyment is short, it is necessary for the appetite to occur again quickly too.

That the animals with two rows of teeth have a small stomach was stated previously,[177] and pretty much all of them fall into two different sorts; for some have a stomach like that of the dog, others like that of the pig. That of the pig is larger and has some folds of moderate size, in view of the longer time it takes for concoction to occur, while that of the dog is small in size, not greatly exceeding that of the intestine, and smooth inside.

After the stomach lies the nature of the intestines in all the animals. Like the stomach, this part too exhibits many differences. For in some animals it is simple and alike when uncoiled, while in the others it is not alike; for in some the part near the stomach is wider, the one near the end narrower (that is why the dogs release this sort of residue with difficulty), but in most it is narrower above, wider near the end. The intestines of the horned animals are larger and have many convolutions, and the bulk of the stomach and of the intestines in these animals is greater, because of their large size; for (one might almost say) all the horned animals are large due to their nourishment's being worked up. In all those animals with intestines that are not straight this part becomes wider as it proceeds, and they have a so-called colon, and the blind and bulky part of the intestine; then, from this point, it gets narrower again and coiling. The part after this extends straight to the outlet for the residue; in some this part, which is called the "anus," is fatty, in others devoid of fat.

All these parts have been devised by nature for the appropriate workings on the nourishment and on the residue produced. For as the residue proceeds downward it comes into a roomier place, where it remains in order to undergo change in those animals that are more receptive of and requiring more nourishment, whether because of their size or the heat of the place. Then, in turn, just as a narrower intestine receives it from the upper cavity,[178] so from the colon and the roomier place in the lower cavity, it again goes into a narrower place, and then into the spiral coil, when the residue has been altogether deprived of liquid, in order that nature can store it and the emission of the residue not occur all at once.

All those animals that must be more temperate in regard to the production of nourishment do not have roomy places in the lower cavity that are large, but instead have many spirals and intestines that are not straight. For roominess produces an appetite for a large quantity of nourishment, while straightness produces quickness of appetite's [return]; that is why among all those animals that have simple receptacles or roomy ones, the latter are gluttonous in terms of quantity, the former in

177. 674[a]23–25.
178. The stomach.

terms of quickness. But since in the upper receptacle, during the first entrance of the nourishment, it is necessarily fresh, and as it proceeds downward, excrement-like and deprived of liquid, it is also necessary for there to be some intermediate place in which it undergoes change and is neither still fresh nor already excrement.

It is because of this that all animals of this sort have the so-called fasting-place, in the thin intestine after the stomach; for this is intermediate between the upper one, in which the unconcocted nourishment is, and the lower one, in which the already useless residue is. This place is found in all animals, but is clear to perception in those that are larger and when they have fasted, not when they have eaten. For it is when **676ª1** they are fasting that a middle place between the two places is found, but when they have eaten the opportune time for undergoing the change is short. In the females the fasting-place is found anywhere in the upper part of the intestine, while the males have it before the blind place[179] of the lower cavity.

3.15
Rennet

All the multi-stomached animals have the so-called rennet, and among the single-stomached ones, the hare. The multi-stomached ones have the rennet neither in the large stomach, nor in the net, nor in the last one, the reed, but rather in the one intermediate between the last one and the two first ones, the one called the "vase." All these have rennet because of the coarse-grainedness of their milk; but the single-stomached ones do not have it, for the milk of the single-stomached ones is fine-grained. That is why the milk of horned animals solidifies, while that of the hornless ones does not solidify. Rennet is produced in the hare, though, because it feeds on herbs with a fig-like juice; for juice of this sort composes the milk in the stomach of the sucklings. Why, among the multi-stomached animals, rennet is produced in the vase was stated in the *Problems*.[180]

BOOK 4

4.1
The Viscera of the Four-Footed Egg-Laying Animals and the Snakes

As regards the viscera, the stomach, and each of the other parts mentioned, they are the same way in the four-footed egg-laying animals and the footless ones such as the snakes. In fact, the nature of the snakes is of the same kind as that of these;

179. Secluding καὶ.
180. Not in our text of that title.

for it is like that of a long, if also footless, lizard. And all these parts are much the same in these animals and in the fishes too, except that they have a lung, because they are terrestrial, while the fishes do not have one, but have gills in place of a lung. Neither the fishes nor any of these animals have a bladder, except for the turtle; for the liquid is diverted into their scales (since they drink little because of the bloodlessness of their lungs), just as in the birds it is diverted into the feathers. And in all these animals the residue is whitish, as it also is in the birds. That is why, in those animals that have a bladder, when the residue flows out, and earthen salt settles in its receptacles; for the sweet and drinkable part is used up, because of its lightness, for the flesh.

The vipers exhibit the same difference in relation to the other snakes as the selachians do in relation to the other fishes; for both the selachians and the vipers are externally live-bearing, after being internally egg-laying first.

All animals of this sort are single-stomached, just like the others that have two rows of teeth; they also have altogether small viscera, like others that do not have a bladder. But in the snakes, because of the shape of their body, which is long and narrow, the configuration of the viscera is also long because of this, and unlike that of the other animals, because, just as in a mold, their configurations are shaped by the place.

All the blooded animals have an omentum, a mesentery, and the parts having to do with the nature of the viscera, and further, a diaphragm, a heart, and—except for the fishes—a lung and a windpipe. And the position of the windpipe and the esophagus is the same in all that have them due to the causes stated previously.[181]

4.2
The Gallbladder

Most of the blooded animals also have a gallbladder, some attached to the liver, others attached to the intestines, since its nature, no less than of these, is that of the lower stomach. This is most clear in the case of the fishes; for they all have a gallbladder, most of them near the intestines, though some have it woven along the whole intestine—for example, the bonito; most of the snakes have it in the same way. That is why those who say[182] that the nature of the gallbladder is for the sake of a certain sort of perception are not correct. (For they say that it exists because of the following, in order that when [the bile] is stinging the part of the soul around the liver, it makes [people] frown, but when it is released, it makes [people] cheerful.) For some animals have no gallbladder at all—for example, the horse, the mule, the ass, the deer, and the

181. 665a16–22.
182. Plato, *Timaeus* 71d.

roe deer. The camel does not have a separate one either, but rather has gallbladder-like blood vessels. The seal has no gallbladder at all either, nor, among the marine animals, does the dolphin.

Within the same kind, some appear to have a gallbladder, others not to have one—for example, in the mice kind. The human being is also among these kinds; for some appear to have a gallbladder attached to the liver, while others do not. That is why in fact a dispute occurs about the entire kind; for those who happen upon one of the two suppose that all of them—absolutely all of them—are that way. This sort of thing also happens with regard to the sheep and the goats; for while most of them have a gallbladder, in some places—for example, in Naxos—it is so large that the excess seems to be monstrous, but in other places they do not have one—for example, in Chalcis in Euboea, in a certain place in their country. Further, as was said,[183] the gallbladder of fish is much detached from the liver.

The followers of Anaxagoras seem to have supposed incorrectly that bile is a cause of the acute diseases (for when it is excessive, it flows, they think, to the lung, the blood vessels, and the ribs). For pretty much all of those in whom these diseased conditions occur have no gallbladder, and this would become evident in dissections; further, the quantity of bile present in these illnesses is incommensurable with that sprinkled about.[184] Instead, just as the bile, when it occurs in the rest of the body seems to be a residue or a colliquescence, so also the bile near the liver seems to be a residue and not to be for the sake of something, just like the sediment in the stomach and that in the intestines. Sometimes, to be sure, nature even uses residues for some beneficial thing; but it is not necessary, because of this, to seek what something is for the sake of in every case; on the contrary, when certain things are of the sort they are, many other things happen of necessity.

Those animals in which the composition of the liver is healthy, and the nature of the blood secreted into it sweet, either do not have any gallbladder at all near the liver, or the bile is in small blood vessels, or else some have it, while others do not. That is also why the livers of those animals without a gallbladder are, generally speaking, bright-colored and sweeter; of those with a gallbladder, the part of the liver below the gallbladder is sweetest. But from those livers composed of less pure blood, the residue that is produced is the bile. For the residue tends to be contrary to the nourishment, and bitter is contrary to sweet, and the sweet blood is the healthy blood. It is evident, then, that bile is not for the sake of anything, but is instead a by-product.

That is why in fact, among the ancients, the ones who say that a cause of living for a long time is not having bile are most sophisticated, after having looked at the solid-hoofed animals and the deer; for these animals are without bile and also live a long time. Further, there are animals, not observed by them, that do not have bile,

183. $676^{b}16$–20.

184. As evidenced (perhaps) by the quantity of yellow bile stains found around the gallbladder.

like the dolphin and the camel, and these also turn out to be long-lived. For since the nature of the liver is vital and necessary for all the blooded animals, it is reasonable that its being of a certain quality is a cause of living for a shorter or a longer time. **677ᵇ1** And that the residue of this viscera is of this sort, and not that of any of the others, is in accord with reason. For no humor of this sort can be near the heart (for the heart does not accept any forceful affection), and none of the other viscera is necessary to these animals, but the liver alone; that is also why this humor occurs around it alone. And it would be absurd not to think that phlegm or sediment from the stomach is a residue wherever one sees it; likewise, it is clear that the same applies to the bile and that it does not differ in its places.

4.3
The Omentum

As regards the gallbladder, then, the cause due to which some animals have it and others do not have it has been stated. It remains to speak about the mesentery and the omentum. For these are in the place and among the parts that are under discussion.

The omentum is a membrane that is suety in those animals that have suet, and fatty in those animals that have fat. Of what sort each of these is was stated previously.[185] The omentum has its starting-point, in the single-stomached and the multi-stomached animals alike, from the middle of the stomach along the line traced on it like a suture. It extends over the remainder of the stomach and the mass of the intestines in the blooded animals, in the terrestrial, and in the aquatic ones alike.

The generation of this part occurs of necessity as follows: for when a mixture of dry and wet is heated, the surface always becomes skin-like and membranous, and this place is full of nourishment of this sort. Further, because of the thickness of the membrane, it is necessary for the part of the bloodlike nourishment that is filtered through it to be fatty (for this is the most fine-grained), and, because of being concocted by the heat in this place, instead of being a flesh-like and bloodlike composition, it is necessary for it to become suet or fat.

The generation of the omentum, then, occurs in accord with this account, and nature uses it for the good concoction of the nourishment, in order that the animals concoct their nourishment more easily and quickly; for what is hot is able to concoct, what is fatty is hot, and the omentum is fatty. And because of this it has its starting-point from the middle of the stomach, because the part that is situated near it, the liver, aids in concoction.

The omentum, then, has been spoken about.

185. 2.5, *HA* 3.17–18.

4.4
The Mesentery

The so-called mesentery is a membrane but extends continuously from the long stretch of the intestines to the great blood vessel and the aorta, and is itself full of many densely packed together blood vessels that extend from the intestines to the great blood vessel and the aorta. **678ª1**

We will find that its generation is of necessity, like that of the other parts. Due to what cause it is present in the blooded animals is evident on investigation. For since it is necessary for the animals to take in nourishment from outside, and again for the final nourishment to come from this, and for an immediate distribution of it to be made to the parts (this final nourishment is nameless in the bloodless animals, but in the blooded ones it is called "blood"), there must be something through which the nourishment will be carried, like through roots, from the stomach into the blood vessels. But while the plants have their roots in the earth (for it is from there that they get their nourishment), for the animals the stomach and the capacity of the intestines is earth, from which they must get their nourishment. That is why it is the nature of the mesentery to have blood vessels, like roots, going through it. What the mesentery is for the sake of, then, has been stated; but in what way it gets the nourishment, and how what is distributed to the blood vessels, by going through the blood vessels from the incoming nourishment, enters these parts in question, will be discussed in the *Generation of Animals* and *On Nourishment*.[186]

How the blooded animals have the parts that have been distinguished up to this point, then, and due to what causes, has been stated. The parts that contribute to generation, by which the female and male seem to differ, are the next ones remaining to be spoken about; but since generation must be spoken about, it is appropriate to speak about these parts too in the theoretical investigation concerning those subjects.

4.5
The Bloodless Animals

Those animals called "soft-bodied" and "soft-shelled" exhibit many differences in relation to those animals;[187] for first of all, they do not have the nature of the viscera at all. Similarly, none of the other bloodless animals has it either. And there are two remaining kinds of bloodless animals, the hard-shelled ones and the insect kind. For none of these animals has what the nature of the viscera is composed of, blood, because this sort of affection[188] is something belonging to their substance; for that

186. $650^{b}8$–11.
187. The blooded ones.
188. The absence of blood.

some animals are blooded and others bloodless will be present in the account defining their substance. Further, none of the things for the sake of which the blooded animals have the viscera will be present in animals of this sort; for they have neither blood vessels nor a bladder nor do they breathe; instead, it is alone necessary for these to have the analog of the heart. For, in all the animals, the perceptual part of the soul and the cause of life belong to a certain starting-point of the parts and of the body. And they all have the parts for nourishment of necessity as well; but their ways of getting their nourishment differ because of the places in which they get it.

The soft-bodied animals have two teeth around the part called the "mouth," and in the mouth, in place of a tongue, something fleshy, with which they discern the pleasantness of what they eat. In the same way, the soft-shelled animals also have these primary teeth and the fleshy analog of the tongue. Further, all the hard-shelled animals have a part of this sort, due to the same cause as in the blooded animals, for the perception of the nourishment. Similarly, the insects in some cases—for example, the bee kind and the fly kind—have a proboscis protruding from their mouth, as was said previously;[189] but those that do not have a sting in front, have a part of this sort inside the mouth—for example, the ant kind and any other animals of this sort there may be. Some insects have teeth, but of quite another sort, just as the fly kind and bee kind do, while others—all those that use liquid nourishment—do not have them. For many insects have teeth not for nourishment but for strength. Some of the hard-shelled animals, as was also said in the accounts at the start,[190] have the so-called strong tongue, while the spiral-shelled ones have two teeth, like the soft-shelled animals.

After the mouth, in the soft-bodied animals, there is a long gullet, following it a crop, like in the birds, then, continuous with it, a stomach, and following it a simple intestine until the outlet. In the cuttlefishes and the octopuses, the parts around the stomach are alike in configuration and to the touch; but while in the ones called "calamaries" there are similarly two stomach-like receptacles, one of the two is less crop-like, and these parts differ in shape from those in the former animals because the entire body is also composed of softer flesh. These animals have these parts in this way due to the same cause as the birds also do; for none of them is able to grind up the nourishment, which is precisely why the crop is in front of the stomach.

For protection and preservation these animals have the so-called ink, which forms in a membranous sac, with its outlet and limit exactly where the residue of the stomach is released through the so-called pipe; and this is in their underneath parts. All the soft-bodied animals have this special part, but most of all and in the greatest quantity, the cuttlefish; for when it is frightened and alarmed, as a protection in front of its body, it makes the water black and inky. The calamaries and the octopuses have the

189. 661ª15–20.
190. Perhaps 661ª20–24, also *HA* 528ᵇ30–33.

ink above, nearer to the *mutis*,[191] while the cuttlefish has it below near the stomach; for it has more because it uses it more. And this happens to it because, though it lives its life inshore, it has no other means of protection, in the way that the octopus has its useable tentacles[192] and change of color, which happens to it, just as the release of ink also does, because of cowardice. (Among these animals, the calamary is the only deep-sea dweller.) The cuttlefish, then, has more ink because of this, and has it lower down because there is more of it; for it is easily released, even from a distance, because of its greater quantity. The ink occurs just as in the birds a white earthen sediment on their residues does: so in these animals too the ink occurs because they do not have a bladder; for the most earthen part is secreted into the ink; and the largest quantity in the cuttlefish because it is the most earthen. A sign of this is that its cuttlebone is of this sort; for the octopus does not have this, while the calamaries have one that is cartilaginous and thin. Due to what cause some have it and others do not, and what sort each of them has, was stated.[193]

These animals are bloodless, and because of this they are chilled and fearful, and just as in some animals, when they are alarmed, the stomach gets disturbed, while in others residue flows from the bladder, so in these animals the release occurs of necessity because of cowardice, just as it does from the bladder in animals that urinate, but nature at the same time uses this sort of residue for protection and preservation.

The soft-shelled animals, both those of the crayfish form and the crabs, have the two primary teeth, and between them the tongue-like flesh, as was also said previously;[194] immediately following the mouth they have a gullet that is small in comparison to the [great] size of their bodies (the comparative greatness being relative to the comparative smallness); following this they have a stomach, in which the crayfishes and some of the crabs have other teeth, because the upper ones do not cut sufficiently; and from the stomach a simple intestine goes straight to outlet for the residue.

Each of the hard-shelled animals also has these parts, some more articulated, others less so. But each of them is more distinct in the larger animals. The spiral-shelled animals also have teeth that are hard and sharp, as was said previously,[195] with the fleshy part in between like in the soft-bodied animals and the soft-shelled ones. They also have the proboscis, as was said,[196] in between a sting and a tongue, and following the mouth a sort of bird-like crop, and following this a gullet; after this comes the stomach, in which is the so-called *mêkôn*, continuous with which is a simple intestine that has its starting-point from the *mêkôn*; for in all the shelled animals this residue, which seems to be especially edible, is present.

191. *HA* $524^{b}14–18$.
192. *HA* $524^{a}2–4$.
193. $654^{a}9–26$.
194. $678^{b}22–25$.
195. $678^{b}24$
196. $678^{b}13–15$.

The other spiral-shelled animals—for example, the purpuras and trumpet-shells—
15 are like the sea snails. But there are many kinds and forms of hard-shelled animals; for some are spiral-shelled, like the ones mentioned just now, some are bivalves, and some are univalves. In a way, though, even the spiral-shelled ones seem to be bivalves; for all animals of this sort have from birth an operculum over the visible part of the flesh for protection—for example, the purpuras, the sea snails, the nerites, and every
20 kind of this sort. For where the shell does not stand in front, it is easy for this part of the animal to be harmed due to external things striking against it. The univalves, due to being attached to something, preserve themselves by having their shell on their back, and by means of an alien protection become bivalves in a way—for example, the
25 so-called limpets; the bivalves—for example, the scallops and the mussels—do so by closing themselves up; and the spiral-shelled ones do so by means of this operculum,[197] as if becoming bivalves from univalves. But it is most of all the urchin that has a place of shelter; for its shell encircles it with a thick covering fortified with spines. Among
30 the hard-shelled animals, this is special to it, as was said previously.[198]

The nature of the soft-shelled animals and the hard-shelled ones is composed in the opposite way to that of the soft-bodied animals; for in the latter the fleshy part is outside, while in the former it is inside, and outside is the earthen part. The urchin, though, has no fleshy part at all.

35 All these animals and the other hard-shelled ones, as was said,[199] have a mouth, a tongue-like part, a stomach, and an outlet for the residue, though they differ in position and size. The way in which each of them has these parts must be observed
680ᵃ1 with the help of the *History of Animals* and the *Dissections*. For some things must be made perspicuous by reason, others more by observation.

Among the hard-shelled animals, the urchins and the so-called sea-squirt kind are
5 special. The urchins, for their part, have five teeth and between them the fleshy part, as in the case of all the animals mentioned, and following this a gullet, and after it the stomach, which is divided into many parts, as if the animal has many stomachs. For though they are separated and full of residue, they are attached to a single gullet
10 and end at a single outlet for the residue. Beyond the stomach, sea urchins have no fleshy part, as was said;[200] they have several so-called eggs, each in a separate membrane; and in a circle around the mouth are scattered certain black entities that are
15 nameless. Though there are several kinds (for there is not one form of all urchins), all of them have these parts; the so-called eggs are not edible in all of them, however, and are altogether small outside those of the common sorts. This is generally the case for the other hard-shelled animals as well; for their flesh too is not equally edible in
20 all cases, and the residue, the so-called *mêkôn*, is in some cases edible, in others not

197. 679ᵇ18.
198. Reference unclear.
199. 678ᵇ22–25.
200. 679ᵇ34.

edible. In the spiral-shelled animals, this is in the spiral, in the univalves in the base (for example, the limpets), and in the bivalves at the hinge.

In the bivalves the so-called egg is on the right side, while the outlet for the residue is on the other side. Those who call this part an "egg" do not call it so correctly; for this, like the fat in blooded animals, is present when they are thriving. That is also why it occurs during the seasons of the year—spring and fall—when they thrive; for in the cold and in hot spells all the hard-shelled animals suffer, and are unable to bear the excesses. A sign of this is what happens to the urchins; for right from birth they have these eggs, and more so during full moons, not because of feeding more, as some people think, but because the nights are warmer due to the light of the moon. For since they are sensitive to the cold because of being bloodless, they are in need of heat. That is also why in summer they are more thriving everywhere, except in the straits of Pyrrha; the ones there thrive no less in winter. The cause of this is that they are better supplied with food then, since the fishes leave the place during this season. **$680^{b}1$**

All the urchins have an equal odd number of eggs; for they have five, and the same number of teeth and of stomachs. The cause of this is that the egg, as was said previously,[201] is not an egg but a thriving condition of the animal. This so-called egg occurs only on one side in the hard-shelled animals;[202] and it is the same in the urchins too. Therefore, since the urchin is spherical, and not, as in the case of the body of the other hard-shelled animals, a single circle, and since the urchin is not circular in one dimension and not in another, but is so in all of them (for it is spherical), it is necessary for the egg too to be likewise. For there is not in the urchin, as in the others, a dissimilarity in its circularity. For the head is in the middle in all those; but this sort of part is up above in it. But its egg cannot be continuous; for it is not so in the others, but is on one side of the circle only. Therefore, it is necessary, since this part is common to all, while the spherical body is special to the urchin, for the eggs not to be even in number. For they would be diametrically opposed, because it is necessary to have one side like the other, if they were even and diametrically opposed. But if they were that way, the eggs would be on both sides of the circle. But this is not how it is in the other hard-shelled animals either; for it is on one side of their circumference that the oysters and the scallops have a part of this sort. Therefore, it is necessary that there be three, five, or some other odd number of eggs. But if they had three, they would be too far apart, but if more than five, they would be continuous; and of these, the first is not the better option, and the second is not possible. Therefore, it is necessary for them to have five eggs.

Due to the same cause, their stomach too is so divided, and the number of their teeth the same. For each of the eggs, since it is like a sort of body belonging to the animal, must necessarily have a likeness to its mode of life; for its growth is from

201. $680^{a}25$–27.

202. *Ostrea*, which also means "oysters," as at $680^{b}23$, seems here and at $680^{b}10$ and $^{b}22$ to have a more general meaning.

there. For since, if the stomach were one, the eggs would be too far away, or it would entirely occupy the cavity, so that the urchin would have difficulty moving and the container would not be full of nourishment; but since the interstices are five, it is necessary, since it is in each one, for the stomach to be divided into five. And due to the same cause, the number of teeth is also that many; for in this way nature can make the same assignment to the parts mentioned.

681ᵃ1 Why, then, the urchin has an odd number of eggs, and why just the number it has, has been stated; but of why some have altogether small ones, others large ones, the cause of this is that the latter are hotter in nature; for the hot is better able to concoct the nourishment, which is why the inedible urchins are more full of residue. And the hotness of their nature prepares them to be more mobile, so that they go grazing and do not remain sedentary. A sign of this is that urchins of this sort always have something on their spines, for they are frequently moving; for they use their spines as feet.

The sea squirts differ little from the plants in their nature, nonetheless they are more animal-like than the sponges; for these have altogether the capacity of a plant. For nature changes continuously from inanimate things to animals via those things that are alive though they are not animals in such a way that the one seems to differ altogether little from the other due to their closeness to each other.

The sponge, then, as was said,[203] by living only when it is attached, and ceasing to live when detached, is altogether like the plants. The so-called sea cucumbers and the lungs,[204] and further, certain other marine animals of this sort, differ a little from sponges in being detached; for none of them has perception, and they live as if they were detached plants. Even among the terrestrial plants, there are some sorts that both live and grow, some in other plants, others even detached, such as the one from Parnassus that some people call a "rock plant";[205] for it lives for a long time when hung up on pegs. And sometimes, even with the sea squirts, and any other kind of this sort there may be, which by living only when attached are much the same as a plant, but by having something fleshy would seem to have some perception, it is unclear on which side one is to put them. For this animal has two ducts and one vent, by which it takes in liquid as nourishment and in turn expels the leftover wet secretion; for it has no clearly perceptible residue, as the other hard-shelled animals do. That is why it is just to call this animal most of all, and any other of this sort there may be, "plant-like"; for none of the plants has any residue either. Through its middle there is a thin diaphragm, in which it is reasonable for what controls its life to belong.

Those that some people call "sea nettles" and others call "anemones" are not **681ᵇ1** hard-shelled animals, but fall outside the kinds resulting from division, and play a double game as both plant and animal in nature. For by being detached and falling upon their nourishment, and by perceiving what they fall upon, some of them are

203. 681ᵃ11–12.
204. *HA* 548ᵃ11.
205. Perhaps the houseleek.

animal-like. Further, they use the roughness of their body for their preservation. But by being incomplete, becoming quickly attached to the rocks, and by having no evident residue, though they have a mouth, they are much the same as the plant kind. Also similar to it is the starfish kind; for it too, after falling upon many of the hard-shelled animals, sucks their juice, and it is also like the detached animals mentioned—for example, the soft-bodied and soft-shelled ones. The same account also holds of the hard-shelled animals.

The parts concerned with nourishment, then, which are necessarily present in all animals, are the way we described, and clearly there must be some part, analogous to those present in the blooded animals, that controls the perceptual modalities; for this part must be present in all animals. But this part, among the soft-bodied animals, is a liquid situated in a membrane, through which the gullet extends to the stomach, that is attached more to the back, and is called the *mutis* by some people. There is another part of this sort in the soft-shelled animals too, and that one is also called the *mutis*. This part is liquid and body-like at the same time, and the gullet, as was just said, extends through the middle of it; for if it were between this part and the back, it would not be capable of taking on the degree of distension it does when nourishment enters, because of the hardness of the back. The intestine is on the outside of the *mutis*, and the ink is near the intestine, in order that it keep furthest away from the entrance and that what is disagreeable be far away from the better part and the starting-point. That this part is the analog of the heart, its place makes clear (for it is the same) and the sweetness of its liquid, inasmuch as it is concocted and bloodlike. In the hard-shelled animals, though the part in control of perception is the same way, it is less noticeable. However, in all those animals that are stationary this starting-point must always be sought around the middle, between the part that receives the nourishment and the part through which the secretion, either the spermatic one or the residual one, is produced, while in all the animals that move by walking, it must always be sought in the middle between the parts on the right and those on the left. **682^{a}1**

In the insects, the part in which this sort of starting-point belongs, as was said in the first accounts,[206] is between the head and the cavity around the stomach. In most of them this is one part, but in the rest it is more than one, as in those that are centipede-like and elongated. That is why they live when they are cut up. For nature tends in every case to make only one part of this sort, but when it is unable, it makes it actively only one, but potentially many. But this is clearer in some than in others.

The parts for nourishment are not alike in all insects, but exhibit much difference. For in some the so-called sting is inside the mouth, as if it were a combination that has at the same time the capacity of the tongue and of the lips. In those that do not have the sting in front there is a perceptual organ of this sort behind the teeth. Following this part in [pretty much] all of them is an intestine that is straight and simple up to the outlet for the residue; though in some this part has a spiral. Some have a

206. *HA* $531^{b}26$–$532^{a}5$, *Juv*. $468^{a}20$–$^{b}15$, $474^{b}1$–3.

stomach after the mouth, and from the stomach a spiraling intestine, so that those that are more voracious and larger in nature have a receptacle for a greater quantity of nourishment.

But among these, the cicada kind has the nature that is most special; for the same part has mouth and tongue united in one nature, through which, as through a root, it receives nourishment from liquids. All the insects, to be sure, are among the animals that take little nourishment, not so much because of their smallness as because of their coldness (for the hot needs nourishment and concocts the nourishment quickly, while the cold needs little nourishment), but most of all the cicada kind. For sufficient nourishment comes from the liquid left behind from the wind,[207] as with the ephemeral animals (these occur around the Black Sea), except that they live for a period of one day, while the cicadas live for more than one, though for few of them.

Since the internal parts present in the animals have been spoken about, it is necessary to return again to the remainder of the external parts. And it is necessary to begin with the animals that have just now been spoken about, and not from those where we left off,[208] so that from those that need less time spent on them, the account may have more time to spend on the complete and blooded animals.

4.6
The External Parts of the Insects

The insects among the animals are not numerously multipartite, but nonetheless exhibit differences in relation to each other. In fact, though, they are all many-footed, **682[b]1** because, relative to the slowness and coldness of their nature, their many-footedness makes their movement more rapid; and the most many-footed ones are the ones that become coldest due to their length—for example, the centipede kind. Further, it is because of having many starting-points that there are many sections[209] and many feet corresponding to these. All those that have fewer feet are flyers to compensate for the deficiency of feet.

Among the flyers, those whose mode of life is nomadic and who, because of their nourishment, must go from place to place, are four-winged and the bulk of their body is light—for example, the bees and the animals akin to these; for they have two wings on each side of the body. But those flyers that are small are two-winged, like the ant kind. And those that are light and have sedentary lives are many-winged like the bees, but have wing cases—for example, the cockchafers and insects of this sort—in order to preserve the capacity of their wings. For since they are sedentary,

207. Reading πνεύματος.
208. 3.2.
209. *HA* 487[a]32–34.

they are more easily destroyed than those that move easily, which is why they have a protection for these.

Their wing is unsplit and without a shaft; for it is not a feather-wing but a skin-like membrane, which, because of its dryness, of necessity detaches itself from the body when their fleshy part gets cold.

The insects have sections both due to the causes stated[210] and in order to save themselves from injury by curling up; for those that are elongated roll themselves up, and this could not occur in them, if they did not have sections. Those that do not roll themselves up make themselves harder by drawing their sections together. This becomes clear when they are touched—for example, in the case of the so-called dung beetles; for when they are frightened, they do not move, and their body becomes hard. And it is necessary for these animals to have sections; for it belongs in their substance to have many starting-points, and in this respect they are like the plants. For just like the plants, these animals when divided are also able to live; except that while these are able to do so up to a certain point, plant [sections] become complete in nature, that is, two or more plants come to be from one.

Some of the insects also have stings, for protection against those doing them harm. In some the sting is in the front, in others in the rear; in those that have it in the front, it is at the tongue; in those that have it in the rear, it is at the tail. For just as in the elephants the perceptual organ for odors has become useful both for strength and for purposes of nourishment, so in some of the insects the sting has been positioned at **683^{a}1** the tongue; for they both perceive the nourishment with this part and take it up and bring it to themselves.

All those whose sting is not in the front have teeth, some for eating, others to grasp nourishment and bring it to themselves—for example, the ants and all of the bee kind. All those whose sting is in the rear, because of their spiritedness, have the sting as a weapon. Some have their stings within themselves, like the bees and the wasps, because they are flyers; for since these stings are thin, outside they would be easily destroyed; while if the sting were prominent, as in the scorpions, it would provide them with a heavy load. (For the scorpions, though, since they are terrestrial animals and have a tail, it is necessary to have the sting on this, or else for it to be of no use for strength.) No two-winged insect has a sting in the rear. For it is because of being weak and small that insects are two-winged; for small animals are adequately lifted up by a smaller number of wings. And because of the same thing they have their sting in front; for since they are weak, they are just barely able to strike with things in front.

The many-winged insects, due to being larger in nature, are provided with a larger number of wings and have their strength in their rear parts. And it is better, if possible, not to have the same instrument for dissimilar uses, but rather the defensive one must be sharp, while the tongue-like one must be spongy and able to draw in the nourishment. For where it is possible for two things to be used for two works and not

210. $682^{b}4$–5.

impede each other, nature is accustomed not to make things as a blacksmith, with a view to economy, makes a spit-lamp; but where this is not possible, nature uses the same thing for more than one work.

Some of the insects—since, due to their hard eyes, they do not have exact sight—have long front feet in order that they can clear away things that fall in front of them with their front legs; which is precisely what both the flies and the bee-like kind appear to do; for they are always crossing their front legs. The back legs are longer than the middle ones both for walking and for ease in being lifted up from the earth when flying away. In all the jumping insects, this is yet more evident—for example, in the locusts and the flea kind; for when they bend and then extend [their back legs], it is necessary for them to be lifted up from the earth. The locusts do not have the rudder-like legs[211] in the front but in the back only. For it is necessary for the bend [in
683[b]1 these legs] to incline inward,[212] and none of the front limbs is of this sort. All insects of this sort are six-footed with the jumping ones included.

4.7
The External Parts of the Hard-Shelled Animals

The body of the hard-shelled animals is not multipartite. The cause of this is that they are stationary in nature; for it is necessary for the ones that are capable of movement to be more multipartite, because actions belong to them; for those participating in many actions need many instrumental parts. Among these animals, some are altogether immobile, while others participate in little movement; but nature, for their preservation, has put the hardness of their shells around them. Some of them are univalves, some bivalves, some spiral-shelled, as was said previously.[213] Among these, some have a spiral, like the sea snails, while others are just spherical, like the urchin kind. Among the bivalves, some open up—for example, the scallops and the mussels (for they are closed on one side, so as to open and close on the other); others are sealed on both sides—for example, the razor-fish kind.

All the hard-shelled animals, like the plants, have their head downward. The cause of this is that they get their nourishment from below, just as plants do by means of their roots. The result is, then, that in these the down parts are up and up parts down. They are within a membrane, through which they filter fresh water and get their nourishment. And though all have a head, the other parts of the body, besides the receptacle for the nourishment, are nameless.

211. *HA* 532[a]28–30.
212. I.e., toward the body.
213. 679[b]15–17, *HA* 4.4.

4.8
The External Parts of the Soft-Shelled Animals

The soft-shelled animals all move by walking, which is why they have numerous feet. There are four greatest kinds of them, the so-called crayfishes, lobsters, carids, and crabs. Of each of these there are many forms, differing not only in shape but also a lot in size; for some are large while others are altogether small.

Those that are crab-like and crayfish-like are similar in that both have claws. These they have not for the sake of progression, but for getting and holding, in place of hands. That is also why these bend in the contrary way to the feet; for the feet bend and twist toward the concave, the claws toward the circumference.[214] For in this way they are useful for grasping the nourishment to be carried toward the mouth. They differ in that the crayfishes have a tail, while the crabs do not have a tail; for, because **684^{a}1** they are swimmers, a tail is useful to the former (for they swim by leaning on their tails as on oars); but to the crabs it is of no use, because they live near the shore and in holes. All the crabs that are deep-sea dwellers have, because of this, feet that are much more unfit for progression—for example, the spider crabs and the so-called Heracleotic crabs—because they move little, but their preservation is attained by their being like the hard-shelled animals. That is why the spider crabs are thin-legged, the Heracleotic crabs small-legged.

The altogether small crabs that are caught among the small fishes have their back feet flat, in order that they be useful to them for swimming, since they have the feet as fins or oars. The carids differ from the crab-like animals in having a tail, and from the crayfish-like ones because they do not have claws; these they do not have because of having many feet; for [what should contribute to] growth at that place has been used up here. And they have many feet because they are no more swimmers than they are walkers.

The parts underneath and around the head in some cases are gill-like to take in and emit water; the lower parts are more laminar in the female crayfishes than the males; and the parts on the flap are hairier in the female crabs than the males, because they spread out their eggs on these, rather than expelling them, like the fishes and the other egg-layers; for since they are roomier and larger, these parts have more room for the eggs.

In all the crayfishes and the crabs, the right claw is larger and stronger; for all animals naturally do more with the parts on the right; and nature always assigns each thing either only or more so to those able to use it—for example, tusks, teeth, horns, spurs, and all the parts of this sort that are for protection and strength. The lobsters alone—both the males and the females—have one of the two claws larger, whichever one it happens to be. The cause of their having claws is that they are in the kind that

214. *IA* $704^{a}17$–$^{b}7$. The circumference is to be imagined as drawn around the body of the animal. Bending toward it is bending toward its convex part.

has claws, while they have this part in an irregular way because they are deformed, and
684ᵇ1 do not use it for what it is naturally for, but for progression.

As regards each of the parts, what their position is and what differences they exhibit in various animals, including in what way the males differ from the females, these must be observed with the help of the *Dissections* and the *History of Animals*.[215]

4.9
The External Parts of the Bloodless Animals

The internal parts of the soft-bodied animals were spoken about previously,[216] as also were those of the other animals. Externally, they have the trunk of the body, which is undivided,[217] and in front of this they have feet around the head, between the eyes, and around the mouth and teeth. The other animals with feet have them in the front and the back in some cases, in others coming out from the sides, like the many-footed bloodless animals. But this kind has them in a special way; for they have all their feet at the so-called front. The cause of this is that the back of these animals has been joined to their front, just like the hard-spiral-shelled animals.

For, in general, the hard-shelled animals are in one way like the soft-shelled animals and in another way like the soft-bodied ones; for in that the earthen part is outside and the fleshy part inside, they are like the soft-shelled animals; but in the way that the shape of their body has been composed they are like the soft-bodied ones; though this is so in a certain way for all of them, it is especially so for the spiral-shelled ones that have the [internal] spiral. For in both cases,[218] the nature [of the internal parts] is this way: if one considered it as a straight line, as it is in the case of the four-footed animals and the human beings, first, at the extreme upper point of this straight line is a sort of mouth, A, next the gullet, B, then the stomach, C; from this the intestine goes to the outlet of the residue, D. This, then, is the way it is in the blooded animals, and around this [straight line] are the head and the so-called thorax. As for the remaining parts, nature has added them for the sake of these [internal] parts and for the sake of movement—for example, the front limbs and the back ones. In both the soft-shelled animals and the insects, the straight course of the intestinal parts, at any rate, tends to be the same way [as in the blooded animals], though with respect to the motor services of the external parts they are different from the blooded animals.

The soft-bodied animals and the hard-spiral-shelled animals are much the same as each other, but the opposite way to these others. For the end-point has been bent
685ª1 around to the starting-point, as if, by bending the straight line, labeled E, one were to bring D close to A [Fig. 1].

215. *HA* 4.2–3, 5.7.
216. 4.5.
217. *HA* 527ᵇ8–10.
218. The hard-shelled animals and the soft-bodied ones.

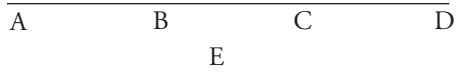

Fig. 1

For this is how the intestinal parts are in fact situated in the soft-bodied animals, and the cavity—which is called a "head" only in the case of the octopuses—is situated around them, while in the hard-shelled ones the spiral shell is like this. They do not differ in any other way, except that in the soft-bodied animals the surrounding part is soft, while in the others nature has put something hard around the fleshy part in order to preserve them, because of their difficulty in moving. That is why the residue, in both the soft-bodied animals and spiral-shelled ones, comes out near the mouth, except that in the soft-bodied ones it does so from below it, in the spiral-shelled ones from the side. It is due to this cause, then, that the feet of the soft-bodied animals are this way, and the contrary way to the others.

The cuttlefishes and the calamaries are unlike the octopuses because they are swimmers only, while the octopuses are also walkers. For the former ones have their legs above small, and, among these, the two outermost ones are the larger, while of the remaining ones, the two of the eight that are below are largest. For just as in the four-footed animals the back limbs are stronger, so in these animals the underneath ones are larger; for these support the weight and most of all move the animal. And the two outermost ones are larger than those in the middle because they collaborate with them. In the octopus, though, the four middle limbs are largest.

All these animals have eight feet, but the cuttlefishes and the calamaries have short feet, the octopus-like animals long feet. For the trunk of the body in the first ones is large, in the second ones small, so that in the second nature has taken away from the body and added to the length of the feet, while in the first, by taking from the feet, it increased the body. That is why in the second ones the feet are not only useful for swimming, but also for walking, while in the first ones they are useless for this; for their feet are small, but they have a large trunk. And since their feet are short and useless both for holding on to and not being dragged away from the rocks when there are waves and storms, and for drawing things to themselves from far away, because of these things, they have two long proboscises with which, mooring themselves, they lie at anchor like a ship, when there is storm, and by which the cuttlefishes and the calamaries hunt prey from far away and draw it toward themselves. The octopuses, though, do not have these proboscises, because their feet are **685^{b}1** useful to them for these things.

In all those animals that have suckers attached to their feet and tentacles, these parts have a capacity like that of the small plaited tubes with which the ancient doctors set fingers: they too have been plaited from fibers with which they draw in fleshy, yielding things. They surround them when they are relaxed; but when they tighten, they squeeze and hold on to everything touching them on the inside. So, since there

is nothing with which to draw things toward themselves other than feet in some and proboscises in the others, they have these parts for strength and other protection in place of hands.

The other octopuses have two rows of suckers, but one kind of octopus has one row. The cause of this is the length and thinness of their nature; for it is necessary for a narrow tentacle to have one row of suckers. It is not, then, because it is best that they have it, but because it is necessary due to the special account of their substance.

All these animals have a fin in a circle around the trunk. In the case of the other soft-bodied animals this is closed and continuous, as it is too in the case of the large calamaries. But in the smaller ones, the so-called small calamaries, this part is flatter and not narrow, as in the cuttlefishes and octopuses, and it starts from the middle and does not go all the way around in a circle. They have this part in order to swim and for steering, just like the rump feathers in the flyers and the tail fin in the fishes. But this part is smallest and least noticeable in the octopuses, because they have a small trunk and are sufficiently steered by their feet.

The internal and external parts of the insects, then, and of the soft-shelled animals, the hard-shelled animals, and the soft-bodied animals have now been spoken about.

4.10
The Remaining External Parts of the Blooded Live-Bearing Animals

It is necessary to investigate again from the start the blooded live-bearing animals, starting with the remainder of the previously mentioned[219] parts; once these have been distinguished, we will speak about the blooded egg-laying animals in the same way.

The parts around the head of the animals were spoken about previously,[220] and those around the so-called neck and the throat. All the blooded animals have a head; but in some **686ᵃ1** of the bloodless ones this part is indefinite—for example, in the crabs.

All the live-bearing animals have a neck, while among the egg-laying animals, some have one and some do not have one; for all those with a lung also have a neck, while those that do not draw breath from outside do not have this part. The head is mostly for the sake of the brain; for it is necessary for the blooded animals to have this part, and in a place opposite the heart, due to the causes stated previously.[221] And nature also placed some of the perceptual modalities on it, due to the blend of the blood being well proportioned, that is, suitable both for the heat of the brain and for the rest [from movement] and exactness of the perceptual modalities. Further, nature

219. 2.10–3.3.
220. 655ᵇ27–665ᵃ25.
221. 652ᵇ16–27.

has placed under it a third part, the one that crafts the incoming nourishment; for it is most fittingly situated there. For it was not possible for the stomach to be situated above the heart, that is, the starting-point, nor—being below the heart as it in fact is—was it possible for the entrance also to be below the heart; for the length of the body would be great, and the entrance would be very far from the starting-point of movement and of concoction.[222] The head, then, is for the sake of these things, while the neck is for the sake of the windpipe; for it is a shield, and it preserves the windpipe and the esophagus by encompassing them in a circle. Although in the other animals the neck is flexible and has vertebrae, the wolves and the lions have a neck consisting of a single bone; for nature had in view what was useful for their strength more than for other protections.

Following the neck and the head in these animals are the front limbs and the thorax. The human being, in place of front limbs and front feet, has arms and the so-called hands. For alone among the animals it stands upright, and this is because its nature and substance are divine, and the work of what is most divine is understanding and thinking; and this is not easy if a large part of the body is pressing down from above; for weight makes the movement of understanding and the common perceptual modality sluggish. That is why, when the weight and the corporeal part become too great, it is necessary for the body to incline toward the earth, so that for preservation's sake, nature put front feet under the four-footed animals in place of arms and hands. For it is necessary for all those animals that move by walking to have two back limbs, and animals of this sort became four-footed because their soul is unable to bear their weight. **686^{b}1**

For all the other animals are dwarf-like compared to the human being; for something is dwarf-like when its upper part is large, while the part that bears the weight and walks is small. The upper part is the so-called thorax, extending from the head to the outlet for the residue. In the human beings this part is proportional to the lower part, and in those who are completely grown it is much smaller; but when they are young the contrary is the case: the upper part is large, the lower one small. That is why they crawl and are unable to walk. And at first they do not even crawl, but rather do not move; for all children are dwarfs. But as human beings advance in age the lower parts grow, while in the four-footed animals the contrary occurs: the lower parts are largest at first, but as the animals advance in age they grow in the upper part, which is the cavity extending from the fundament to the head. That is also why foals are not at all, or only a little, smaller than horses in height, and why, when they are young, they are able to touch their head with their back limb, but are not able to when older. The solid-hoofed and cloven-hoofed animals are this way, while the hornless multi-split-footed animals, though dwarf-like, are less so than those; that is

222. The argument assumes that the mouth must be connected by an esophagus to the stomach above because the animal is live-bearing, and so it must have a neck and an esophagus (664^{a}20–25).

also why the growth of their lower parts in relation to the upper parts is in proportion to the deficiency [in their dwarf-likeness].

The bird kind, the fish kind, and every blooded kind are dwarf-like, as was said.[223] That is also why all animals are less practically wise than human beings. For even among human beings, children in comparison to grown men, and among the latter in their prime, the naturally dwarf-like—even if they have a surplus of some other capacity—are deficient in the possession of understanding. And the cause of this, as was said previously, is that in very many animals[224] the starting-point of the soul is sluggish and corporeal. Further, as the heat that raises becomes less and the earthen material becomes greater, the bodies of the animals also become smaller and many-footed, and in the end they become footless and stretch themselves out on the earth. Proceeding in this way a little further, even the starting-point they have is below, and the part corresponding to the head is incapable of movement and perception, and they become a plant, having the upper parts below, the lower parts above; for the roots of plants have the capacity of a mouth and a head, while the seed is the contrary; for it comes to be up above, on the uppermost shoots.

The cause, then, due to which some animals are two-footed, some many-footed, and some footless, and due to which some came to be plants and some animals, has now been stated, and why the human being is the only animal that is upright. And since it is upright in nature, it has no use for front limbs, but in place of these nature has provided arms and hands.

Anaxagoras said that it was because they have hands that the human beings are the most practically wise of the animals; it is reasonable, however, that it is because human beings are the most practically wise that they get hands. For the hands are instruments, and nature, like a practically wise human being, always distributes each instrument to the one able to use it. For surely it is more fitting to give pipes to someone who is a pipe player than to provide the one who has pipes with the craft of pipe playing; for nature has provided the lesser thing to the greater and more controlling one, not the more estimable and greater one to the lesser. If, then, it is better this way, and nature does the best of the things that are possible, it is not because it has hands that the human being is practically wisest, but because it is the most practically wise of the animals that it has hands. For the most practically wise animal would use the greatest number of instruments well, and the hand would seem to be not one instrument, but many; for it is, as it were, an instrument for instruments. To the one, then, able to acquire the most crafts, nature has provided the most useful of the instruments, the hand.

However, those who say that the human being is not well composed, but instead is the worst off of the animals (for it is, they say, barefoot, naked, and without weapons for strength), do not speak correctly. For the other animals have but one protection,

223. 686[b]2–5.

224. Reading πολλοῖς.

and cannot change it for another, but rather it is necessary for them to sleep and do everything as if they always had shoes on their feet, and never lay aside the shelter around their body, nor change whatever weapon they happen to have. For the human being, on the other hand, it is always possible to have many sorts of protection and to change them, and further, to choose what weapons to have, and to choose where **687ᵇ1** to have them. For the hand becomes a claw, talon, horn, spear, sword, and any other weapon or instrument whatever; for it will be all these due to being able to grasp and hold them all.

And for this the form of the hand has been appropriately contrived by nature. For it is divided and multi-split; for it is possible for a thing in a divided condition to be a compound, but not for a thing in a compound condition to be divided. And it is possible to use the hand as one, two, or many. Also, the joints of the fingers are well-disposed for grasping and squeezing.

One finger[225] is on the side of the hand, and is short and thick, not long [like the others]; for just as, if there were no hand at all, one could not grasp things, so too one could not grasp them if this finger were not on the side; for it squeezes from below upward, the others from below downward; and this must happen if, like a strong clamp, it is going to unite strongly, in order that, while being one, it may be equal to many. And it is short both because of strength and because it is of no benefit if it is long. Also, the last finger is rightly small, and the middle one long, like the middle oar of a ship; for it is above all necessary that what is grasped be encircled in the middle for the hand to do its work. It is because of this that it is called the "large finger," though it is small, because the other fingers are (one might almost say) useless without it.

The [form] of the nails has also been well contrived; for the other animals have nails for their use, while in the human beings they are a covering; for they are a protective cover for the fingertips.

The joints of the arms are—both for the bringing of nourishment to the mouth and for other uses—the contrary way to that in the four-footed animals. For in those it is necessary for the front limbs to bind inward; for they are used as feet, in order to be useful for progression; although, even among these animals, in the many-toed ones the front limbs tend to be useful not only for progression, but also in place of hands, as is in fact evident when they are being used; for they both grasp things and defend themselves with their front limbs. The solid-hoofed animals, by contrast, do **688ª1** so with their back limbs; for in them the front limbs do not have an analog of the elbows and hands. Some of the many-toed animals, because of this, have five toes on the front feet, but four toes on the back ones—for example, the lions, the wolves, and further, the dogs and the leopards; for the fifth toe is large, like the fifth finger on the hand. But the small many-toed animals have five toes on the back limbs as well,

225. I.e., the thumb.

because they are creepers, in order to grasp easily with their many nails and creep to a greater height, even overhead.

Between the arms in the human beings, and in the others between the front limbs, is the so-called chest. In the human beings it is broad, which is reasonable (for since the arms are situated on the side, they do not prevent this place from being wide), while in the four-footed animals, because of the forward extension of the limbs when they walk and change place, this part is narrow.

Because of this, the four-footed animals do not have breasts in this place; but in the human beings, because of the roominess of the chest and the need to shelter the parts around the heart, because of this, since the place is fleshy, the breasts have been differentiated. In the males they are fleshy due to the cause mentioned, but in the females nature has used them for an additional distinct work, precisely as we say it often does; for it puts away nourishment there for the offspring. There are two breasts because the parts are two, the left and the right. And they are harder, but separated, because the ribs are joined together in this place, and because their nature is not burdensome.

In the other animals, by contrast, it is impossible to have the breasts on the chest between the limbs (for they would impede progression); and they, in fact, have them in many ways. The few-offspring-bearing solid-hoofed horned animals have breasts between the thighs, and have two of these; the many-offspring-bearing or multi-split-footed animals in some cases have them around the abdomen and on the side, and have many—for example, the pig and the dog; in other cases, they have only two, around the mid-abdomen—for example, the lion. The cause of this
688b1 is not that it is few-offspring-bearing, since sometimes it gives birth to more than two, but that it does not produce much milk; for it uses up the nourishment it gets in its body, and it gets it rarely because it is carnivorous.

The elephant has only two breasts, and these are below the armpits of the front limbs. The cause of its having two is that it is one-offspring-bearing; of its not having them between the thighs, that it is multi-split-footed (for none of the multi-split-footed animals has them between the thighs); and of its having them up toward the armpits, that these are the primary breasts in those that have many breasts, and yield the most milk. A sign of this is what happens in the case of the pigs; for to the firstborn of the piglets they offer the primary breasts; hence, when the firstborn is the only one, it is necessary for it to have the primary breasts; and the ones below the armpits are primary. Due to this cause, then, the elephant has two breasts and in this place.

The many-offspring-bearing ones have them around the abdomen. The cause of this is that there must be many breasts for those that are going to rear many offspring; since, then, breadthwise it is impossible to have other than two, because the left and the right are two, it is necessary to have them lengthwise; and the place intermediate between the front limbs and the back limbs alone has length.

Those that are not multi-split-footed but are few-offspring-bearing or horned also have their breasts between the thighs—for example, the horse, the ass, the camel (for these are one-offspring-bearing, and while the first ones are solid-hoofed, the camel is cloven-hoofed), and again, the deer, the cow, the goat, and all the others of this sort. The cause of this is that growth in these animals is toward the upper part of the body. So where a collection and surplus of residue occurs (and this place is the one down and around the places of efflux), there nature has produced the breasts; for wherever a movement of the nourishment occurs, there too it is possible for the breasts to get it. In the human being, both the female and the male have breasts, while in the other animals some of the males do not have them—for example, some male horses do not have them, others (the ones that are like the mother) do have them.

The breasts have now been spoken about. After the chest is the place around the stomach, which is not enclosed by the ribs due to the cause stated previously,[226] in order that they do not impede either the expansion of the nourishment, which necessarily occurs when it is heated, or the uterus during pregnancy. At the end of the so-called thorax are the parts around the outlet for the residue, both liquid and dry.

Nature uses the same part for the outlet of the liquid residue and in regard to mating, alike in both the females and the males, in all the blooded animals, with a few exceptions, and in all the live-bearing ones. The cause of this is that the semen is something liquid and a residue; let this be assumed for now, later it will be proved.[227] It is the same way with the menses in the females, and the part with which the semen is emitted; these things too will be determined later; for now let it be assumed that the menses in the females are also a residue. The menses and the semen are both liquid in nature; so, that the excretion of things that are the same and alike is in these parts is in accord with the account.

How both the parts having to do with the seed and the parts having to do with the embryo are internally and in what way they differ are evident with the help of the *History of Animals*[228] and the *Dissections*, and will be stated later in the *Generation of Animals*.[229] But that the configurations of these parts has a necessary relation to their work is not unclear to perception. The instrument of the males exhibits differences in accord with the differences of the body; for not all are equally sinewy in nature.[230] Further, this part alone, without a change indicative of disease, increases and reduces in size; for of these, its increase is useful for copulation, its reduction for the use of the rest of the body; for if it were always in the same state, it would be an impediment. But this part is in its nature composed of things of this sort so that both changes can happen; for in part it is sinewy and in part cartilaginous, which is why it is able both to contract and have extension, and so be receptive of breath.

226. 655^{a}1–4.
227. *GA* 1.18–20.
228. E.g., 493^{a}24–^{b}6, 497^{a}24–35, 3.1.
229. 1.2–16.
230. *HA* 500^{b}19–25.

The female four-footed animals all urinate backward because this position is useful for mating, while a few of the males urinate backward—for example, the lynx, the lion, the camel, and the hare; but none that is solid-hoofed urinates backward.

689ᵇ1 The posterior parts and the parts around the legs in the human beings are special in comparison to the four-footed animals. Pretty much all of the latter have a tail, not only the live-bearing ones, but also the egg-laying ones; for even if this part is not large in those that have it, at any rate, they have as a token a sort of stump. The human being, on the other hand, though tailless, has haunches, while none of the four-footed animals does. Further, the human being also has fleshy legs, both thighs and shanks, while the others all have fleshless legs, not only the live-bearing ones, but all the animals that have legs; for they have sinewy, bony, or spinous ones. And of (one might almost say) all these things there is one particular cause, that the human being alone of the animals is upright. In order, then, for it to easily carry the upper parts, which are light, nature, by taking what is corporeal from the upper parts, added the weight to the lower ones; that is why it made the haunches fleshy as well as the thighs and the calves. At the same time the nature of the haunches is rendered useful for periods of rest; for standing is not wearying for the four-footed animals, and they do not get tired from doing this continuously (for, since they have four underlying supports, it is as if they continue to lie down), but for the human beings it is not easy to remain standing upright—on the contrary, their body has a need for resting and sitting.

The human being, then, has both haunches and fleshy legs due to the cause mentioned, and because of this is tailless (for the nourishment that is carried there is used up on these parts, and because of having haunches, the use for which a tail is necessary is removed), while in the four-footed and the other animals it is the contrary; for since they are dwarf-like, all the weight and all that is corporeal is situated in the upper part, having been removed from the lower ones. That is why they are without haunches and have long legs. And in order for the part that serves as the outlet of the residue to be guarded and in a protective shelter, nature has provided them with the so-called caudal appendage or tail, by taking the nourishment that is produced in the legs. But the ape, because its shape plays a double game, and is neither of these and also both, has neither tail nor haunches because of this: as being two-footed, it has no tail; as being four-footed, no haunches. Among the so-called
690ª1 tails, however, there are many differences, and nature uses these too for additional purposes, not only for a protection and covering for the fundament, but also for the benefit and use of their possessors.

The feet in the four-footed animals differ; for some of them are solid-hoofed, some cloven-hoofed, and some multi-split-footed. They are solid-hoofed in all those animals in which, because of their size and of having much earthen material, in place of horns and teeth, this sort of part receives a secretion into the nature of the nail, and because of its abundance, in place of many nails, there is one, the hoof.

Because of this they also lack a knucklebone, for the most part, because the presence of a knucklebone makes bending the back leg more sluggish; for limbs with one joint straighten and bend more quickly than those with many, while the knucklebone, since it is a fastener,[231] is like an alien limb put between the two, adding weight while also making the step more stable. For it is because of this, in fact, that those animals with a knucklebone do not have a knucklebone in the front limbs but in the back ones, because the leading ones must be nimble and easy to bend, while there must be stability and elasticity in the back ones. Further, for defense, the knucklebone makes the blow heavier; and animals of this sort use their back limbs for kicking what is hurting them. The cloven-hoofed animals, though, do have a knucklebone (for their back limbs are lighter), and because they have a knucklebone they are also not solid-hoofed, since the bony material left out of the foot remains in the joint. But the multi-split-footed animals do not have a knucklebone; for then they would not be multi-split-footed, but rather the foot would be split only for as much of its breadth as the knucklebone extends over. That is also why most of those that have one are cloven-hoofed.

The human being has the largest feet of all the animals for its size, and reasonably so; for it alone stands upright, so that since they, being two, are going to bear all the weight of the body, they must have both length and breadth. Also, the size of the digits is contrariwise in the feet and in the hands, which is in accord with the account; for the work of the hands is to grasp and squeeze, so that the digits must have length (for the hand grasps with the part that bends), while that of the feet is to walk stably, so that the unsplit part of the foot must be considered as corresponding to these digits. And it is better that its extremity be split rather than unsplit; for otherwise the entire foot would suffer together if one part were harmed, but since it is divided into toes, this does not happen to the same extent. Further, since they are short, the toes are also less liable to injury; that is why the feet of the human beings are multi-split, not long-toed, and have the nail kind due to the same cause as in the hand; for the extremities must be especially protectively covered because of their weakness.

Pretty much all the blooded live-bearing terrestrial animals have now been spoken about.

4.11
The Egg-Laying Animals

Among the blooded egg-laying animals, some are four-footed, others footless. But only one kind among these is footless, that of the snakes. The cause of their being footless was stated in the studies concerned with determining the modes of animal

231. 654b21.

progression.[232] In other respects they are much the same in shape as the four-footed egg-laying animals.

These animals have a head, and the parts on it, due to the same causes as in the other blooded animals, and a tongue in their mouth, except for the river crocodile; this animal seems not to have one, but the place alone. The cause of this is that in a way it is at once terrestrial and aquatic: because it is terrestrial, it has a place for a tongue; because it is aquatic, it is tongue-less. For among the fishes, as was said previously,[233] some seem not to have a tongue, unless one opens their mouth very wide, while others have an unarticulated one. The cause of this is that there is little use for a tongue in these animals because it is not possible for them to chew or taste, but rather it is in swallowing that the perception and the pleasure of the nourishment occur in all these animals. For while the tongue produces the perception of flavors, the pleasure of solid foods occurs in swallowing; for it is when they are being swallowed that oily, hot ones and others of this sort are perceived. The live-bearing animals also have the same perception—indeed, the enjoyment of pretty much the majority of gourmet dishes and solid foods occurs due to the expansion of the esophagus during swallowing. That is why those that are intemperate concerning drinkable things and flavors are not the same as those that are intemperate concerning gourmet dishes and solid food, but though in the other animals the perception of flavor is also present, in those animals,[234] as it were, [only] the other perception[235] is.

Among the four-footed egg-laying animals, the lizards, like the snakes, have a divided tongue with a tip that is altogether hair-like, as was said previously.[236] The seals also have their tongue divided; that is also why all these animals are gluttonous. The four-footed egg-laying animals are also sawtoothed, just like the fishes. All their perceptual organs are like those of the other animals—for example, of smell, nostrils, of sight, eyes, and of hearing, ears (except not sticking out, but the duct only, just like the birds). The cause in both cases is the hardness of the skin; for the birds are feathered, while all these animals are hard-scaled; and the scale is, as regards its region, the same as the soft scale, but is in nature harder. This is clear in the case of the turtles, the large snakes, and the river crocodiles; for their scales become stronger than their bones, implying that this is their nature.

These animals[237] do not have the upper eyelid, as the birds also do not, but instead close their eyes with the lower one, due to the cause mentioned in the case of the birds.[238] Some of the birds also blink with a membrane that comes from the corners of the eyes, but these animals do not blink; for they are harder-eyed than the birds.

232. *IA* 708ᵃ9–20.
233. 660ᵇ11–25.
234. The egg-laying ones.
235. See *EE* 1231ᵃ12–17.
236. 660ᵇ6–10.
237. The four-footed egg-laying ones.
238. 657ᵇ4–7.

The cause of this is that, for the birds, sharp-sightedness is more useful for their mode of life, since they are flyers, but for these animals it is less useful; for all animals of this sort are hole-dwellers.

Since the head is divided in two, the upper part and the lower jaw, the human being and the live-bearing four-footed animals move the jaws up, down, and to the side, while the fishes, the birds, and the egg-laying four-footed animals move them up and down only. The cause of this is that this sort of movement is useful for biting and cutting, that to the side for grinding. For those, then, that have molars, movement **691ᵇ1** to the side is useful, but for those that do not, it is not at all useful; that is why it is excluded in all animals of this sort; for nature produces nothing superfluous. Though all the other animals move their lower jaw, the river crocodile alone moves the upper one. The cause of this is that it has feet that are useless for grasping and holding; for they are altogether small. For these purposes, then, in place of feet, nature has made a mouth that is useful to it. But for holding or grasping, it is from whichever of the two directions the blow would be stronger, that it is more useful for the jaw to be moved; and it is always stronger from above than from below. Since, then, the use of the mouth is for both grasping and biting, and its use for seizing is more necessary for an animal with neither hands nor feet naturally well suited for it, it is more useful for these animals to move their jaw from above than from below.

Due to the same cause crabs also move the upper part of their claw, not the lower; for it is in place of hands that they have claws, so that the claws must be useful for grasping, not for cutting. Cutting and biting are the work of teeth. In the crabs, then, and in all the other animals that are able to do their seizing at leisure because of not using their mouth in the water, cutting and grasping are divided, that is, they grasp with hands and feet, while they cut and bite with the mouth. But in the crocodiles nature has made the mouth useful for both things, by having the jaws move in this way.

All animals of this sort also have a neck, because they have a lung; for they breathe through the windpipe, which is long. And since the part between the head and shoulders has been called the "neck,"[239] among animals of this sort, the snake would seem least of all to have a neck, but rather an analog of the neck—at any rate, if it is in terms of the extremes just mentioned that one must determine this part. In comparison to animals of the same kind, it is special to the snakes to be able to turn their head to the rear while the remainder of the body is at rest. The cause of this is that, **692ᵃ1** like the insects, they are able to roll up, inasmuch as their vertebrae are flexible and cartilaginous. Of necessity, then, due to this cause, this happens to them, but also for the better, for the sake of protection against being harmed from behind; for being long and footless they are naturally unsuited both for turning around and keeping watch on things coming from behind; for it is of no benefit to be able to raise their head, but be unable to turn it.

239. *HA* 493ᵃ5.

Animals of this sort also have a part analogous to the chest. But they do not have breasts, either there or on the rest of the body; none of the birds or fishes does either. The cause of this is that none of these animals has milk; and the breast is a receptacle and, as it were, a container for milk. Nor do these animals, nor any of the other non-internally egg-laying ones, have milk; this is because they lay eggs; and it is in the egg that the milky nourishment present in the live-bearing animals is produced. These things will be talked about more perspicuously in the studies concerning generation.[240] About the bending of the joints common to all animals[241] there was a previous investigation in the *Progression of Animals*.[242]

Animals of this sort also have a tail, longer in some, shorter in others; we stated the universal cause of this previously.[243] The chameleon is the thinnest of all the egg-laying terrestrial animals; for it has the least blood of all. The cause of this is the character of its soul; for because of fear it becomes multiform, and fear is a cooling due to a want of blood and a deficiency of heat.

As regards the blooded animals, then, both footless and four-footed, what all their external parts are, and due to what cause each is present, has pretty much been stated.

4.12
The Birds

Among the birds, differences from each other lie in the excess and deficiency of their parts, that is, are in accord with the more and less. For some of them are long-legged, others short-legged, some have their tongue broad, others, narrow, and it is the same way with the other parts. Taken in isolation, they differ little from each other in their parts, but in comparison to the other animals they differ even in the shape of their parts.

They are all feathered, and this is special to them in comparison to the others; for the parts of the [egg-laying] animals are in some cases hard-scaled, in others soft-scaled, while the birds are feathered. Also, their wing is split and not alike in form to that of the whole-winged animals;[244] for in some animals it is unsplit, in others split, and the unsplit wing is without a shaft, while the split wing has one.

They also have on the head the extraordinary—and special in comparison to the others—nature of the beak. For while in the elephants there is a trunk[245] in place of the hands, and in some of the insects a tongue in place of a mouth, in the birds

240. *HA* 5.33–34, 6.1–15, *GA* 3.1–7.
241. Reading κοινῆς πᾶσιν.
242. 13–17.
243. 689[b]21–690[a]3.
244. The insects.
245. 658[b]35.

there is a beak in place of teeth and lips. The perceptual organs were spoken about previously.[246]

They have a neck that by nature extends [from the body], due to the same cause as the other animals do;[247] in some this is short, in others long, pretty much following along with the legs in most cases. For those that are long-legged have a long neck, while those that are short-legged have a short one, the web-footed ones aside; for if it were short in those with long legs it would not be of service to them for feeding from the earth, nor if it were long in those with short legs. Further, for flesh-eaters length would be contrary to their mode of life; for a long neck is weak, while for them life comes from overpowering. That is why none of the crook-taloned birds has a long neck.

The web-footed ones and those that have divided feet that are, however, turned up like a snub nose, because they are not of the same kind as the web-footed ones, have a long neck (for a neck of this sort is useful for getting nourishment from the water), but legs that are short for swimming.

Their beaks also differ in accord with their modes of life. For some have a straight beak, others a curved one: it is straight in all those in which it is for the sake of nourishment, curved in the carnivorous; for one of this sort is useful for overpowering, and it is necessary for their nourishment to be procured from live animals. But all those whose mode of life is marsh-dwelling and herbivorous have a broad beak; for a beak of this sort is useful for digging, and for drawing in and cropping the nourishment. Some birds of this sort have a long beak, just as also a neck, because of getting their nourishment from the depths. And many birds of this sort that are also web-footed, either unconditionally or in part,[248] live by hunting some of the small animals that live in the water; and for birds of this sort the neck becomes just like a fishing rod, while the beak becomes like a fishing line and hook.

The back and the underneath part of the body, which is called the "thorax" in the four-footed animals, is a naturally unified place in the birds. For attached to this, in place of[249] arms and front feet, they have feathered wings, a part special to them; that is why, in place of a shoulder blade, the extremities of the wings are on the back. They have two legs, as in the human being, though bending inward, as in the four-footed animals, not outward, as in the human being; their wings, like the front limbs of the four-footed animals, bend toward the circumference.[250]

They are two-footed of necessity; for the substance of the bird is that of the blooded animals, but at the same time winged, and blooded animals do not move by means of more than four points.[251] The attached parts, then, are four, as they are in

246. 2.12–13, 16–17, *HA* 4.8.
247. 691ᵇ26–28.
248. 694ᵇ2–5.
249. Reading ἀντὶ.
250. 683ᵇ35.
251. *HA* 490ᵃ26–30.

the other terrestrial animals that move by walking, and also in the case of the birds; but while four arms and legs are present in the former, in the birds, in place of front limbs or arms, there is something common to them, [feathered] wings (for in virtue of these they are able to stretch out [and fly], and being able to fly is included in the substance of the bird), so that it remains for them to be of necessity two-footed; for in this way they will move, with their wings included, by means of four points.

All birds have a chest that is pointy and fleshy: pointy, for flight (for broad ones, in pushing a large quantity of air, move with difficulty); fleshy, because what is pointy is weak, if it does not have much protection. Under the chest is the stomach, which goes to the outlet for the residue and the leg joints, just as in the four-footed animals and the human beings. These, then, are the parts that are between the wings and the legs. All animals that are live-bearing or egg-laying have an umbilical cord during generation, though when the birds are grown it is not noticeable. This is made clear in the studies concerning generation.[252] For the umbilical cord becomes united with the intestine, and is not, as in the live-bearing animals, a part of the blood vessels.

Further, some of the birds are flyers and have wings that are large and strong—for **694ᵃ1** example, the crook-taloned ones and the carnivores; for it is necessary for them to be flyers because of their mode of life, so that for the sake of this they have a mass of feathers and their wings large. But it is not only the crook-taloned ones that are flyers, but also all the other kinds of birds whose preservation lies in the swiftness of their flight or that are migratory. Some birds, though, are non-flyers, but are heavy: those whose mode of life is to stay on the ground and that are grain-eaters or else are swimmers and spend their life around water. The bodies of the crook-taloned birds, wings aside, are small, because the nourishment is used up for their wings, that is, for their weapons and their means of defense; in the non-flyers, on the contrary, the bodies are bulky, which is why they are heavy.

Some of the heavy birds have, as a means of defense in place of wings, so-called spurs on their legs. But the same birds do not at the same time come to have both spurs and be crook-taloned; the cause of this is that nature produces nothing superfluous. And for those that are crook-taloned and flyers spurs are useless; for it is in ground combat that they are useful; that is why they are present in some of the heavy birds. And in these crook-talons would not only be useless but also harmful, since by getting stuck in the ground, they are contrary to progression. That is also why the crook-taloned birds walk with difficulty and do not settle on rocks; for the nature of their talons is contrary to both.

It is of necessity that this occurs during generation; for the hot earthen material in the body becomes parts useful for strength. For when flowing upward it produces either hardness or largeness of the beak, while if it flows downward, it produces strong spurs on the legs, or talons on the feet, that are large and strong. But it does not produce each of these in distinct places at the same time; for if it were spread

252. *HA* 6.3, *GA* 752ᵃ24–ᵇ12, 753ᵇ14–754ᵃ20.

around, the nature of this residue would become weak; but, in some cases, it furnishes length for the legs; in some, in place of these things, it fills in the intermediate **694ᵇ1**
spaces in their feet. And it is because of this that the swimmers among the birds are necessarily web-footed, some unconditionally web-footed, while others, though they have the nature of the particular toes divided, they have something added to each of them like an oar which is, as a whole, continuous. Of necessity, then, these things 5
occur due to these causes; but it is because of what is better for the sake of their mode of life that they have feet of this sort, in order that, since they live in water, and wings are useless, they will have feet useful for swimming. For they become like oars for sailing and[253] fins for the fishes; and that is why if the fins of the latter, or what is 10
between the toes of the former, are ruined, they can no longer swim.

Some of the birds are long-legged. The cause of this is that the mode of life of the birds of this sort is marsh-dwelling; for nature produces the instruments for the work, not the work for the instruments. That is why, then, since they are not swimmers, they are not web-footed, and why, because of spending their life on spongy ground, they are long-legged and long-toed, and most of them have many 15
joints in their toes. And since they are not flyers, but all birds are composed of the same matter, when the nourishment used up on the rump of the other birds goes into the legs, they grow. That is why in flight they use these in place of the rump; for, when they fly, they stretch the legs out to the rear; for in this way they 20
are useful to them, while otherwise they would impede them. But some birds fly while keeping their short legs next to their abdomen; for in these birds the feet do not impede them in that way, and in the crook-taloned ones they also advance the work of grasping prey. 25

Among the birds with long necks, those with a thicker one fly with the neck stretched out, while those with a thin and long neck fly with it bent up; for because of this protective shelter the neck is less easily broken if they fly into something.

All the birds have a haunch, though in such a way that they would seem not to **695ª1**
have one but rather two thigh bones, because of the length of the haunch; for it extends to the middle of the abdomen. The cause of this is that this animal is two-footed, but not upright, so that if indeed it had—as in the human beings and the four-footed animals—a haunch extending a short distance from the fundament, and the leg immediately next to it, it would be unable to stand upright. For the human 5
being is upright, while in the four-footed animals the front limbs serve as supports for their weight. But the birds, because of being dwarfish in nature, are not upright, and do not have front limbs (because of this they have wings in place of these); and in place of this nature has, by making the haunch long, fixed it firmly in the middle 10
of the body, and placed the legs under there, so that with the weight well-balanced on either side, they are able to walk and to stand still.

253. Reading καὶ.

The cause, then, due to which they are two-footed while not being upright has been stated. The cause of their legs being fleshless is the same as in the case of the four-footed animals, which was also spoken about previously.[254]

Every bird, split-footed and web-footed alike, is four-toed. (For about the fact that the Libyan ostrich is cloven-hoofed we will speak later,[255] and, at the same time, about the rest of the ways in which it is contrary to the bird kind.) Three of these toes are in the front, while one is behind for stability, in place of a heel. Among the long-legged birds, this toe is deficient in size—for example, in the case of the *krex*.[256] But they do not have a greater number of toes. In the other birds, the position of the toes is like this; the wryneck[257] alone has two in the back and two in the front. The cause of this is that its body is less inclined forward than that of the others.

All the birds have testicles, but they have them internally; the cause will be stated in the *Generation of Animals*.[258]

695[b]1 The parts of the birds, then, are this way.

4.13
The Fishes

The fish kind is yet more docked in the front parts. For they have neither legs, nor hands, nor wings (the cause of these things was stated previously[259]), but their entire trunk is continuous from the head to the tail. The tail is not alike in all of them, but while some have much the same one, some of the broad fishes have one that is spinous and long. For growth from there is produced in the broad part, as is the case in the torpedo fishes, the stingrays, and any other selachians of this sort there may be. Among fishes of this sort, then, the tail is spinous and long, but in some it is fleshy and short, due to precisely the same cause as in the torpedo fishes; for it makes no difference whether the tail is short with more flesh or long with less flesh. In the case of the fishing frogs[260] the contrary occurs; for because of their broad front part not being fleshy, the quantity of fleshy material nature takes away from there, it adds to its back part and the tail.

The fishes do not have separate limbs, because their nature in accord with the account of their substance is to be swimmers, since nature produces nothing that is either superfluous or pointless. And since, in accord with their substance, they are blooded, it is because of being swimmers that they have fins, and because of not being

254. 689[b]6–15.
255. 4.14.
256. *HA* 609[b]9.
257. *HA* 504[a]11–19.
258. 716[b]17–25, 719[b]10–15.
259. 683[b]7–8, *IA* 714[a]20–[b]7.
260. *HA* 487[a]27.

terrestrial that they do not have feet; for the addition of feet is useful for the movement on land. And it is not possible to have, at the same time, four fins and two feet, or any other limb of this sort; for they are blooded. The water newts, though, while they have gills, have feet; for they do not have fins, but a tail that is open-structured and broad.

Those fishes that are not broad (as the ray and the stingray are) have four fins, two on the back parts and two on the underneath parts. None of them has more than this; for then they would be bloodless. Pretty much all of them have the fins on the back part, but some of those that are long and thick do not have those on the underneath parts—for example, the eel and the conger eel, and the kind of mullet found in the lake in Siphae. All those that grow even longer and are more snake-like, like the muraena, have absolutely no fin, but move by bending, using the water as the snakes do the land; for snakes swim in precisely the way that they crawl on the ground. The cause of the snake-like fishes not having fins is precisely that of the snakes being footless. (The cause was stated in the studies concerning the progression and movement of animals.[261]) For otherwise, if they moved by means of four points, they would move badly; for they would move with difficulty either if they had the fins near each other or if they had them far apart, because of the distance between them. But if their points of movement were more [than four], they would be bloodless. And the cause is also the same in the case of the fishes that have only two fins; for they are snake-like and longer, and use bending in place of the two fins. That is why they crawl on dry ground too and live a long time, and some do not immediately gasp for breath, while those that are akin to terrestrial animals do so less.

696^{a}1

As for the fins themselves, the fishes that have only two fins have them on the back parts (all those not prevented from having them because of their breadth). Those having fins near the head have them because of not having length in that place, by means of which, in place of fins, they will move; for it is at the tail that the body of fishes of this sort is elongated. But the rays and the fishes of this sort, in place of fins, swim by means of their broad extremity.

The torpedo fish and the fishing frog have the fins on the back parts down below because of the broad part above, while those on their underneath parts are near the head. For this does not prevent the broad part from being moved; but to compensate for the breadth of the part above, these are smaller than those on the back. The torpedo fish has its two fins near the tail; but in place of the two [other ones] it uses the broad part of each of its semicircles as two fins.[262]

The parts of the head and the perceptual organs were spoken about previously.[263] The fish kind has as a special part, in comparison to the other blooded animals, the

261. *IA* $708^{a}9$–20.
262. *IA* $709^{b}16$–19.
263. $658^{a}3$–10 (eyes), $659^{b}14$–16 (nostrils), $660^{b}11$–$661^{a}6$ (tongue), $662^{a}6$–15 (teeth), $662^{a}31$–33 (mouth).

696[b]1 nature of the gills; due to what cause was stated in the studies concerning respiration.[264] Also, some of those with gills have covers for the gills, but all the selachians (for they are cartilaginous) are without coverings. The cause of this is that the former are spinous, and the coverings are spinous, but the selachians are all cartilaginous. Further, the movements of these are sluggish due to their being neither spinous nor sinewy, while those of the spinous ones are quick; and the movement of the gill cover must occur quickly; for the nature of the gills is, as it were, for exhalation. That is why, in the selachians, the closure of the ducts of the gills is produced by the gills themselves, and there is no need of a covering in order for it to occur quickly.

Some of the fishes have many gills, others few, some have double gills, others simple ones; but in most the last one is simple. For exactness about these, one must observe them with the help of the *Dissections* and the *History of Animals*.[265] The cause of the number of gills being larger or smaller is a larger or smaller amount of heat in the heart; for the movement must be quicker and stronger in those with more heat. And those with more gills and double gills have a nature of this sort more than those with simple and fewer gills. That is also why some of them (those with fewer and less strong gills) are able to live out of the water for a long time—for example, the eel and all those that are snake-like; for they do not need much cooling.

The fishes also exhibit differences as regards the mouth. For some have the mouth straight across and toward the front, while others have it in the underneath parts—for example, the dolphins and the selachians; and they turn the underneath parts up to seize their nourishment. And nature appears to do this not only for the sake of the preservation of the other animals (for since these fishes are slowed down during the turn the others save themselves; for all fishes of this sort are carnivorous), but also so that they are not guided by their greediness where nourishment is concerned; for if they could grasp it more easily, they would be destroyed because of being filled up too quickly. In addition, the nature of the snout, since it is round and narrow, cannot open easily.

697[a]1 Further, among those that have the mouth up above, some have a mouth that opens wide, others a tapering one: all the ones that are carnivorous have a mouth that opens wide, like the sawtoothed ones, because strength for fishes of this sort lies in the mouth; but all those that are not carnivorous have a tapering one.

As for the skin, some of them have a scaly one (but the scale stands off from the body because of its brightness and thinness), others a rough one—for example, the angelfish and the ray, and the fishes of this sort; but fewest in number are the smooth-skinned ones. The selachians have skin that is scale-less but rough, because of their being cartilaginous; for nature has used up the earthen material from the cartilage on the skin.[266]

264. *Juv.* 476[a]1–16.
265. 504[b]28–505[a]20.
266. 655[a]23–34.

None of the fishes has testicles, either external or internal, nor does any other of the footless animals, which is why the snakes also do not. But the same duct is for the residue and for what has to do with generation, just as in all the other egg-laying four-footed animals, because of their not having a bladder or producing liquid residue.

The fish kind, then, differs in these ways from the other animals.

As for the dolphins, the whales, and all the cetaceans of this sort, they do not have gills, but a pipe, because they have a lung; and the seawater taken in through the mouth is discharged through the pipe. For it is necessary for water to be taken in because they get their nourishment in water, and when it has been taken in, it is necessary to discharge it. Gills are useful for those animals that do not breathe, due to what cause was stated in the studies concerning respiration;[267] for it is impossible for the same animal to breathe and have gills at the same time; instead, for the discharge of water these animals have a pipe. It is situated in front of their brain; for otherwise it would be separated from their spinal column. And the cause of these animals having a lung and breathing is that the large animals need more heat in order to move. That is why the lung in them is full of blood heat. These animals are in a way terrestrial and aquatic; for they take in air like terrestrial animals, but are footless and get their nourishment from water like the aquatic ones.

The seals and the bats, because they play a double game, in the one case, as both **$697^{b}1$** aquatic and terrestrial, in the other, as both flyers and terrestrial—because of this, participate in both and neither. For the seals as aquatic have feet, while as terrestrial they have fins (for their back feet are altogether fish-like, and further, all their teeth are saw-like and sharp); the bats as flyers have feet, but as four-footed they do not; and they have neither a tail nor a rump: because of being flyers, no tail; because of being terrestrial, no rump. This occurs in bats of necessity; for they are skin-winged, and nothing has a rump unless it is split-feathered; for the rump is produced from a feather of this sort. And a tail would be an impediment if it were present among the feathers.

4.14
The Libyan Ostrich

The Libyan ostrich is also the same way; for it is in some respects like a bird, and in some like a four-footed animal. For as not four-footed it has feathers, and as not a bird it does not rise up in flight; in fact, its feathers are not useful for flight, but are hair-like. Further, as four-footed it has upper eyelashes, and it is bald around the head and above the neck, with the result that it has hairier eyelashes; but as a bird its lower parts are feathered; and it is two-footed like a bird, but cloven-hoofed like a four-footed animal; for it does not have toes, but hooves. The cause of this is that its

267. *Juv.* $476^{a}1$–16.

size is not that of a bird but of a four-footed animal. For it is necessary, speaking in universal terms, for birds to be as small as possible in size; for it is not easy for a body of great mass to be moved up off the ground.

As regards the parts, then, due to what cause each is present in the animals has been stated about all of animals individually. These matters having been determined, the next thing is to go through those having to do with their generation.

ON THE MOVEMENT OF ANIMALS*

De Motu Animalium

1
The Internal Points of Rest

As regards the movement of animals, what belongs to each kind of them, what their differences are, and also what the causes are of each of the coincidents that belong to them, all this was investigated elsewhere.[1] What must now be investigated, in general, is the common cause of their moving with any movement whatsoever; for some animals move by flying, others by swimming, some by walking, and some in some other such ways. **698ª1** 5

What moves itself by itself is the starting-point of other movements, of this the starting-point is what is unmoved, and the first mover is necessarily unmoved—this was determined previously[2] in dealing with eternal movement, when it was determined whether or not there is such a thing, and if there is, what it is.[3] But this must be grasped not only by means of universal accounts, but also in the case of the particular and perceptible things because of which we also seek those universal accounts, and which we believe these accounts must fit. For it is evident in these cases too that movement is impossible if there is nothing at rest, in the first place within the animals themselves; for it is always the case that if one part moves, another is at rest, and it is because of this that animals have joints. For they use their joints like the center [of a circle] and the whole part in which the joint is located becomes both one and two, straight and bent, changing [between being them] potentially and actively because of the joint. When it is bending and moving, one point in the joint moves while another remains at rest, just as if geometrical points A and D [Fig. 1] on the diameter were to remain at rest, while point B moved, and [the line] AC comes to be. 10 15 20

* Translated by Andrea Falcon. Text: O. Primavesi et al., *Aristotle: De Motu Animalium. A New Critical Edition of the Greek Text* (Oxford, 2023). Oliver Primavesi generously granted permission to use the diagrams produced for that edition. The correct place for this treatise, which deals with what is common to body and soul (*DA* 433ᵇ19–21), is immediately following *Div. Somn.*

1. *IA*, *HA* 498ª3–ᵇ10, *PA* 6–14.
2. *Ph.* 8.5.
3. *Ph.* 8.1–2, 8.8.

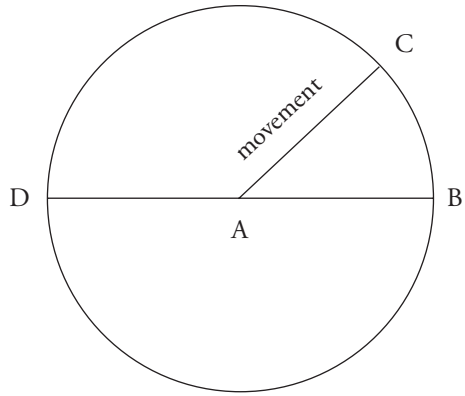

Fig. 1

But in this case the center seems to be in every way indivisible (for in fact move-
25 ment is, as they say, a "fabrication" in such cases; for none of the mathemati-
cal objects moves), whereas the points in the joints come to be now potentially
one but actively divided, now actively one but potentially divided. But then the
698[b]1 starting-point against which [there is movement],[4] insofar as it is a starting-point,
always remains at rest when the lower part moves. For example, when the forearm
moves, the elbow remains at rest; when the whole arm moves, the shoulder remains
at rest; when the leg moves, the knee remains at rest; and when the whole leg
moves, the hip remains at rest. It is evident, then, that each animal must also have
5 something within itself that is at rest, from which the starting-point of what moves
will be, and by supporting itself against which the animal will move all at once both
as a whole and in part.

2
The External Point of Rest

But any rest within the animals is nonetheless ineffective, unless there is something
outside that is unconditionally at rest and unmoved, and it is worth pausing to inves-
10 tigate what has been said; for it makes our theoretical investigation extend not only to
animals but also to the movement—that is, the spatial movement—of the universe.[5]
For just as there must be something unmoved within the animal, if it is to move, even
more so there must be something unmoved outside it, supporting itself against which
15 what is moved moves. For if something always gives way, as it does with "a mouse

4. 698[b]6.
5. Cf. *EE* 1248[a]24–29.

in pitch,"[6] or as it happens with people who try to walk on sand, the animal will not advance, nor will there be any walking if the ground does not stay still, nor any flying or swimming if the air or the water does not exert counterpressure. And it is necessary that this be something other than what is moved, and the whole other than the whole—that is, what is unmoved in this way must be no part of what is moved. Otherwise what is moved will not be moved.

Evidence for this is the following puzzle: Why is it that one moves a boat with ease when one pushes it with a pole from outside, hitting the mast or some other part of it, but when one tries to do this while being in the very same boat, one would not move it, not even if one were Tityus or Boreas blowing from within the boat (if he happened to be trying to sail in the way painters make him do; for they paint him as blowing the wind from within the boat)? For whether one blows out the breath **699ª1** gently or violently so as to produce a very strong wind, or whether it is something other than breath that is blown or pushed out, first, one must push while supporting oneself against some part of oneself that is at rest, and, second, that very part, or the whole thing of which that happens to be a part, must stay put, resting on something that is external. But that someone who is pushing the boat while standing in the boat and supporting oneself against the boat does not move the boat is reasonable, because it is necessary for what one is supporting oneself against to stay put. And in this case it happens that what one tries to move and what one supports oneself against are the same. But if one pushes and pulls the boat from outside, one moves it; for the earth is no part of the boat.

3
Heavenly Movement

But one might raise the following puzzle: If something moves the whole heaven,[7] must there be something unmoved, and must this be neither any part of the heaven, nor in the heaven? For if it moves the heaven while itself moving, it must move it while touching something that is unmoved, and this must be no part of the mover; or if the mover is from the outset unmoved, it will be likewise no part of what is moved. And, at any rate on this front, those who say that no part whatsoever of the sphere [of the heaven] that moves in a circle is at rest are right; for it would be necessary either for the whole of it to remain at rest or for its continuity to be torn apart. But in thinking that the poles have some capacity, though they have no magnitude but are just limits and points, they are not correct. For in addition to the fact that nothing of this kind has any substance, it is also impossible for a single movement to be caused by two movers; but they make the poles two things. It is from going through this

6. A proverbial expression. The pitch gives way under the mouse, so that it has nothing to support itself on to climb out.
7. I.e., the universe.

puzzle that one might conclude that there is something that is related to the whole of nature in the way the earth is related to the animals that move of themselves.

Those who in a myth-like way make Atlas put his feet on the earth would seem to have told their story from the thought that he is like an axis and rotates the heaven around its poles. And this would be in accord with reason because the earth remains at rest. But for those who offer this account it is necessary to say that the earth is no part of the universe. And in addition, the strength of what moves must be [at least] equal to that of what remains at rest. For there is a certain amount of strength and capacity in virtue of which what is at rest remains at rest, just as there is an amount in virtue of which the mover causes movement. And as there is, of necessity, some proportion for contrary movements, so there is too for states of rest. And movements and states of rest that are equal are unaffected by each other, but are mastered in accord with the excess [of either one]. That is why the mover within the universe, whether it is Atlas or any other thing of this sort, must not exert more counterpressure than the stability that the earth requires to stay put. Otherwise, the earth will be moved away from the center, that is, from its own place. For as the thing that pushes pushes, so the thing that is pushed is pushed, and with equal force. But it is the thing that was earlier at rest that causes movement, so its strength must be even greater than, rather than similar or equal to, its state of rest. And likewise with respect to what is moved without causing movement. So the capacity of the earth in its state of rest will have to be as great as the capacity that the whole heaven combined with what moves it has. But if this is impossible, it is also impossible for the heaven to be moved by something of this sort from within.

4
A Closely Connected Puzzle

But there is also a puzzle about the movements of the parts of the heaven, which one might want to investigate because it is closely related to what has just been said. For if someone were to overcome with his capacity for movement the state of rest of the earth, he would obviously move the earth away from the center. And the strength from which this capacity derives is clearly not unlimited, for the earth is not unlimited either, so neither is its weight. But since things are said to be impossible in many ways (for we do not say that it is in the same way impossible for a sound or human beings on the moon to be seen; for the sound is of necessity invisible, but the human beings, although of such nature as to be seen, will not be seen) the following puzzle arises: we think that the heaven is, of necessity, incapable of passing away or of being dissolved, but according to this account it is not so out of necessity. For it is natural and possible that there is a movement greater than the capacity in virtue of which the earth remains at rest, and greater than the capacity in virtue of which the fire and the

body above[8] move. If, then, these prevailing movements do exist, those bodies will be destroyed by one another. And if these movements do not exist, but it is possible for them to exit (for it is not possible for the movement to be unlimited because it is certainly not possible for a body to be unlimited[9]), it would be possible for the heaven to be dissolved. For what prevents this from happening, if indeed it is not impossible? But it is not impossible, if its opposite is not necessary. But about this puzzle let there be a separate account.[10]

[To resume where we left off:] Must, then, there be something unmoved and at rest outside what is moved, which is no part of it, or not? And must this also be so in the case of the universe? For it would perhaps seem absurd if the starting-point of the movement were within. That is why, to those who think in this way, the following would seem to be well said by Homer:

> But you could not drag from the sky down to earth
> Zeus, the highest counselor, not even if you worked very hard
> Take hold, all you gods and all goddesses.[11]

For what is entirely unmoved cannot possibly be moved by anything. Herein also lies the solution to the puzzle just mentioned, as to whether it is possible or not for the arrangement of the heaven to be dissolved if it depends on an unmoved starting-point.

But in the case of animals not only must there be what is unmoved in this way, but also, within those that move with respect to place—all those that move themselves—there must be something by supporting itself against which the one that is moving will move. For one part of the animal must be at rest and another in movement, as when it moves one of its parts; for one part supports itself against another as against something that is at rest.

As regards the inanimate things that move, one might be puzzled as to whether they all have within themselves something at rest and something that moves, and whether they too must support themselves against some external thing that is at rest, or whether this is impossible for something such as fire, earth, or any other of the inanimate things, but is true only of the things by which, as first movers, these are moved. For all inanimate things are moved by something else, and the starting-point of all that is moved in this way are the things that move themselves. Among such things, animals have already been spoken about.[12] All such things must have what is at rest both in themselves and outside themselves, [the latter being something] against which they support themselves. But whether there is something that is higher

8. The heaven.
9. *Ph*. 3.5.
10. *Ph*. 259^{b}20–28.
11. *Iliad.* 8.20–22. Aristotle has rearranged and adapted the Homeric text.
12. Chapters 1 and 2.

and is a first mover is unclear, and concerning a starting-point of this sort there is separate account.[13] But all the animals that move do so by supporting themselves against things that are external to them, even when they breathe in and breathe out. For there is no great difference between throwing a weight that is great or small, which is just what those who spit and cough, and those who breathe in and those who breathe out, do.

5
Extending the Account to Qualitative and Quantitative Change

Must there be something at rest only in what moves itself by itself with respect to place, or also in what alters itself by itself and in what grows? (Concerning coming to be from the start and passing away there is a separate account.[14]) If the first movement is the one we claim it is,[15] this should be the cause of coming to be and passing away, and presumably of all other sorts of movement. And just as in the universe, so too in the animal movement with respect to place is the first movement, provided the animal has reached maturity, so that movement with respect to place is also the cause of growth, if the animal ever comes to be itself a cause by itself, and also of alteration. But if it does not, this is not necessary. The first phases of growth and alteration come to be due to something else and through other things, and there is no way in which it is possible for anything to be, for itself, the cause of coming to be and passing away. For the mover must precede the moved, and the generator the generated, and nothing is prior to itself.

6
The Moving Factors of the Animal

As regards the soul, whether it is moved or not, and if it is moved, how it is moved, was spoken about previously in our determinations concerning it.[16] But since all inanimate things are moved by something else, and since it was determined earlier, in our writings on first philosophy,[17] in what manner the first and eternally moved thing is moved and how the first mover moves it, it remains to grasp theoretically how the soul moves the body, and what is the starting-point of animal movement. For of all other things, except for the movement of the universe, the animate things are the cause of movement (at least, of those that do not move one another by striking

13. *Met.* 12.7–10.
14. I.e., *GC*.
15. I.e., movement with respect to place. See *Ph.* 260b29–261a26.
16. *DA* 1.3–4.
17. *Met.* 12.7.

against each other). That is also why all the movements of these things have a limit; for the movements of the animate ones do too. For all animals cause movement and move for the sake of something, so that this is the limit all of their movement, the for-the-sake-of-which.

But we see that the movers of the animal are thought, perception, imagination, deliberate choice, wish, and appetite. All these can be reduced to understanding and desire. For both imagination and perception hold the same place as understanding; for they all are capable of discerning, although they differ from one another in the ways discussed elsewhere.[18] And wish, spirit, and appetite are all forms of desire, and deliberate choice has a share in both thought and desire. As a result, the object of desire and the intelligible object are the first things to cause movement—not any intelligible object, though, but only the end of things doable in action. That is why, among goods, what causes movement is a thing of this sort, and not just any noble thing; for it is insofar as something else is done for the sake of this, and insofar as it is the end of the things done for the sake of something else, that it causes movement. And one must posit that the apparent good holds the same place as the good, and also the pleasant; for the latter is an apparent good. So it is clear that, in one respect, the thing that is eternally moved by the eternal mover and also each of the animals are moved in a similar way, but that in another respect, they are moved in distinct ways. That is also why the former is eternally moved, whereas the movement of animals has a limit. And what is eternally and truly noble, that is, what is primarily good (and not good at one time but not at another), is too divine and too estimable to be [so] relative to something else.

The first thing, then, causes movement without being moved, but desire and the desiring part cause movement by being moved. But it is not necessary for the last of the moved things to cause movement to anything. It is also evident from these considerations that it is reasonable that the spatial movement of the things moved is last in the chain of events; for the animal moves and progresses due to desire or deliberate choice, when some alteration has taken place in accord with perception or imagination.

7
How the Animal Moves

How is it that, when one understands, sometimes one acts but sometimes one does not, and sometimes one moves but sometimes one does not? It seems that a similar thing also happens in thinking and making deductions about unchanging things. But there the end is a piece of theoretical knowledge (for when one understands the two premises, one has also understood and put together the conclusion), while here the

18. *DA* 3.3–5.

conclusion resulting from the two premises becomes the action. For example, when someone understands that every human being should take a walk, and that he is a human being, immediately he takes a walk; or when he understands that no human should take a walk now, and that he is a human being, immediately he remains at rest. And he does both these things if nothing prevents him [in the one case] or if nothing forces him [in the other]. "Something good must be produced by me; a house is a good thing"; immediately, he produces a house. And "I need covering; a cloak is covering; I need a cloak; what I need I must produce; I need a cloak"; he produces a cloak. And the conclusion, that a cloak must be produced, is an action. He acts, though, from a starting-point: "if there is to be a cloak, then this thing must happen first; but if this thing, then that thing"; and that thing he does immediately. It is clear, then, that the action is the conclusion. But the premises, those that can result in production, come to be through two routes, both through the good and through the possible.[19]

Just as with those who ask dialectical questions, so thought does not at all stop to investigate the other premise, the obvious one. For example, if it is good for a human being to walk, he does not waste time by lingering on the fact that he is human. That is why what we do in action without rational calculation we do quickly. For whenever someone is active either with perception, with imagination, or with understanding, in relation to the for-the-sake-of-which, what he desires he immediately does. For in place of asking questions or thinking, the activation of desire comes about. Appetite says: "I must drink"; "This is drinkable," says perception (or imagination or understanding); immediately, he drinks. In this way, then, animals are impelled to move and to act, with desire being the last cause of their movement, and this arises either through perception, imagination, or understanding. Of the animals that desire to act, some produce or do things in action because of appetite or spirit, others because of deliberate choice or wish.

701b1 Just as the automata move [even] when a small movement has occurred, when the cables are released and the [figures immediately] clash against one another with their [swords]), and when the little wagon that the rider tries to move in a straight line [again] and again, and yet the wagon moves in a circle due to the unequal size of its wheels (for the smaller becomes like a center as in the case of cylinders)—so too do animals move. For they have instrumental parts of this sort: the nature of the sinews and the nature of the bones, the bones corresponding to the pegs and the iron in the example, the sinews to the cables, and when the sinews are released and the bones slackened, animals move. However, in the case of the automata and in the little wagons there is no alteration taking place (since if the inside wheels were to become smaller and then larger again, the same thing would move in a circle). But in the case of the animals the same thing can become both larger and smaller and can

19. I.e., the end (or for-the-sake-of-which) and what the agent can do to further it.

also change its shapes when the parts increase in size and contract due to heat, breath, and cold, and undergo alteration.

Alteration, though, is caused by imaginations, perceptions, or understandings. For perceptions immediately entail their being alterations of a certain sort, while imagination and understanding have the capacity of their objects. For in a certain way the intelligible form of what is either hot or cold, pleasant or frightening, is in its being exactly like each of the relevant things. That is why we shudder and are frightened [even] when we merely grasp these things with the understanding. All such things are affections and alterations. As alterations take place, some parts in the body become greater while others smaller. And that a small change occurring at a starting-point also makes great and numerous differences down the road is not difficult to see—for example, when the rudder shifts a tiny little bit, the change in the direction of the prow is considerable. Further, whenever in virtue of heat or cold or some other affection of this sort an alteration takes place in the region around the heart, or in an imperceptible part within it, this makes a considerable difference in the body, causing episodes of blushing and paleness, of shivering and trembling, and their contraries.

8
Looking for the Internal Starting-Point of Animal Movement

The starting-point of movement, then, as was said,[20] is the object of pursuit and avoidance in the sphere of what is doable in action. But of necessity heating and cooling follow the understanding and the imagination of those things (for what is painful is to be avoided, while what is pleasant is to be pursued). Although this escapes notice when it happens around small parts, pleasant and painful things are pretty much always accompanied by some cooling and heating. This is clear in the case of **702[a]1** affections. For feelings of confidence, fear, sexual arousal, and other bodily affections, both pleasant and painful, are accompanied by heating and cooling—sometimes in a part, and sometimes in the entire body. But memories and expectations too, using affections of this sort as images, are causes of these things, sometimes to a lesser, sometimes to a greater extent. So it is reasonable that the internal parts—those situated in the areas around the starting-points of the instrumental parts—are crafted as they are so as to change from being solidified to liquid and from liquid to being solidified, and to alternate between soft and hard.

Since these things happen in this way, and since what can be affected and what can affect are of such a nature as we have often stated,[21] whenever it happens that there is what can affect and what can be affected, and neither one fails to fulfill its account,

20. 700[b]23–25, *DA* 431[a]9–14.
21. Most notably in *GC* 1.7–9.

then immediately the one affects, and the other is affected. Because of this at the same time, so to speak, someone understands that he must walk, and starts walking (if nothing else impedes him). For the affections suitably prepare the instrumental parts, desire prepares the affections, and imagination prepares the desire. But imagination comes to be through either understanding or perception. And this happens immediately and quickly because what can affect and what can be affected are among the things that are related to each other by nature.

But what first moves the animal must be located in some starting-point. And it has already been stated[22] that the joint is the starting-point of something and the end-point of something else. That is why nature employs the joint in a way as one thing and in a way as two things. For whenever [the animal] is moved from there, it is necessary for one of the end-points to remain at rest and for the other to be moved (for that what moves must support itself against something that is at rest was stated previously[23]). The end-point of the forearm,[24] then, is moved and does not cause movement. Instead, one part in the joint of the elbow causes movement and is moved, namely, the part in the whole thing itself that is moved. But there must also be something that is unmoved, which is what we mean by saying that the elbow is potentially one but in activity becomes two. So if the forearm were the animal, it is somewhere there[25] that the movement-causing starting-point of the soul would be.

But since it is also possible for some of the inanimate things to stand in this relation to the hand, for example, if someone were to cause movement to the stick in his hand, it is evident that the soul should be in neither one of the end-points, neither in the end-point of what is moved nor in the other end-point (for the wood too has both a starting-point and an end-point in relation to the hand). So, because of this, **$702^{b}1$** at any rate, if the movement-causing starting-point from the soul is not located in the stick, it is not located in the hand either; for the extremity of the hand[26] is in the same relation to the wrist, and this part is in the same relation to the elbow. For parts that are attached naturally are in no way different from those which are not; for the stick becomes like a detachable part. Therefore, it is necessary for the movement-causing starting-point of the soul to be in none of the starting-points that are also end-points of something else, not even when there is something else more external than that—for example, the end-point of the stick has its starting-point in the hand, and the end-point of the latter has it in the wrist. But if the starting-point is not located in the hand because it is still higher up, it will not be located in the wrist either; for when the elbow is at rest, all that is below the elbow, and is a continuous part with it, is still moved.

22. $698^{a}16–21$.
23. Chapter 2.
24. I.e., the wrist.
25. I.e., the elbow.
26. I.e., where the hand joins the stick.

9

The Location of the Soul as the Internal Support of Animal Movement

But since the [movement of the animal] is similar from the left and from the right sides, and since contraries are moved at the same time, so that the left is not moved in virtue of the right being at rest, nor the right in virtue of the left being at rest, and the starting-point is always in something higher than both, it is necessary for the movement-causing starting-point of the soul to be in the middle; for the middle is the end-point for the end-points on both sides. And this is the same with respect to the movements from above and from below (for example, the ones from the head) as well as with those proceeding from the backbone, in those animals that have a backbone. And this is reasonable; for we say the perceptual part is also there, so that when, because of perception, the region around this starting-point is altered, and changes, the parts next to it are changed along with it, expanding and contracting, so that of necessity, because of these things, movement comes about in the animals.

The middle part of the body is potentially one, but actively it must become more than one. For it is both the case that the limbs are moved from the starting-point at the same time, and also the case that one is moved while the other is at rest. I mean, for example, in ABC [Fig. 2],

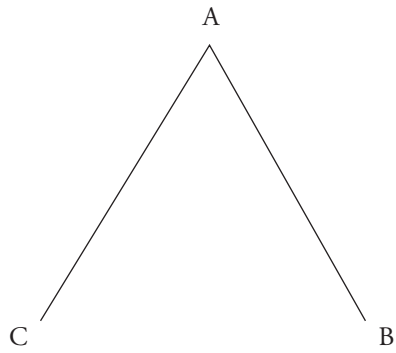

Fig. 2

B is moved, and A causes movement. But there must be something at rest if one is to be moved and the other is to cause movement. Therefore A, being potentially one, will be two in activity, so that necessarily it is not a geometrical point but some magnitude. But it is possible that C too is moved at the same time as B, so that necessarily both starting-points in A cause movement while being moved. Therefore, there must be something else beyond these, something that moves and is not moved. For

the extremities, that is, their starting-points that are in A, would support themselves against each other while they are moved, just as if two human beings were to move **703a1** their legs by supporting themselves on each other's backs. But what moves both must be one, and this is the soul, which is something other than such a magnitude but present in it.

10
Innate Breath

In accord with the account that states the cause of an animal's movement, desire is the intermediate item, the one that causes movement while being moved; and in animate bodies such a thing must be a body. What is moved, then, but is not of such a nature as to cause movement can be affected by an alien sort of capacity; but it is necessary for what causes movement to have some capacity and strength. But all animals manifestly have innate breath and are strengthened by it. In which way the innate breath is preserved was stated elsewhere.[27] But this seems to be related to the soul-involving starting-point[28] as the point in the joints that causes movement and is moved is related to the point that is unmoved. And since the [soul-involving] starting-point is located for some animals in the heart, and for others in its analog, because of this the innate breath too is manifestly located there. But as for the question of whether the breath is always the same or is always changing, let that be for a separate account (for the same question arises about the other bodily parts[29]).

It is evident that breath is naturally well-disposed to be capable of causing movement and supplying strength. And the works of the movement are pushing and pulling, so that the instrument must be capable of being expanded and contracted. And such is the nature of breath; for, since it is contracted and expanded without force, it is capable of pushing and pulling by force due to the same cause. And it has weight in relation to what is fiery and lightness in relation to what is its contrary. What is going to cause movement without [undergoing] alteration must be of this sort; for the natural bodies master each other in accord with their excess: the light is overpowered and brought down by what is heavier, and the heavy is overpowered and brought up by what is lighter.

By means of which moving bodily part the soul causes movement, and due to which cause, has now been stated. But one must suppose that the animal is constituted like a city that is in good legislative order. For once order is implanted in the city, there is no need for a separate monarch who must be present at each of the things that come about, but rather each individual performs his own task as prescribed, and one thing happens after another because of habit. In the animals the very same thing

27. No such focused discussion is extant. *De Spiritu* (*On Breath*) is not by Aristotle.
28. *GA* 737^a7–12, 762^a20, 766^b12–14.
29. *GA* 726^b22–24.

happens because of their nature and the fact that each part is naturally constituted so as to do its own work. So there is no need for soul in each of them, but rather it is situated in some bodily starting-point, and the other bodily parts live by being naturally attached to that, and do their own work because of their nature. **$703^{b}1$**

11
Involuntary and Non-voluntary Movements

How animals move with voluntary movements, then, and due to which causes, has now been stated. However, some of their parts move with involuntary movements, but mostly with non-voluntary ones. I call "involuntary" the movement of the heart and that of the sex organ; for they often move when something appears, although the understanding has not ordered them to do so. And I call "non-voluntary" sleep, awakening, breathing, and all the others of this sort that there are. For neither imagination nor desire are unconditionally in control of any of these. But rather, since it is necessary for animals to undergo natural alteration, and since it is necessary for some of the parts being altered to expand and for others to contract, so that already they are moved and changed with changes that are by nature alternating (and the causes of these movements are heating and cooling, both those from outside and those which are by nature internal), the movements that happen contrary to reason[30] also happen in the parts just mentioned when the relevant alteration has taken place. Understanding and imagination, as was said previously,[31] supply what is capable of producing the relevant [bodily] affections; for they supply the forms of the things that are capable of producing them. And among the parts, the heart and the sex organ most make this clear, because each of them is like a separate animal. The cause of this is that they possess the liquid that is characteristic of life.[32] In the case of the heart, the cause due to which it is so is evident; for it possesses the starting-points of perceptions. But there is a sign that the generative part is of this sort as well; for the capacity of the seed too comes out of it, like a sort of animal.

It is reasonable that the movements go to the starting-point from the parts and to the parts from the starting-point. And in this way the parts also reach each other. One should understand A as a starting-point. Then with respect to each of the letters of the diagram [Fig. 3], the movements proceed *to* the starting-point and *from* the starting-point that is moving and changing, since it is potentially many: the starting-point of B proceeds to B, the starting-point of C to C, and the starting-point of both to both. But the movement proceeds from E to C by going from E to A *as to* the starting-point, and from A to C *as from* the starting-point.

30. $703^{b}7–8$.
31. $701^{b}16–22$.
32. *Ph*. $255^{a}6$, *GA* $733^{a}11$, $761^{a}27$.

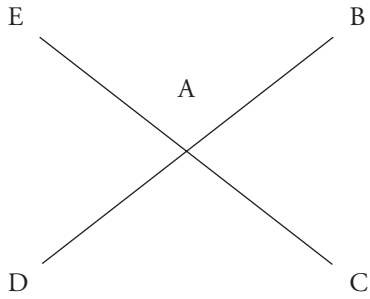

Fig. 3

As for the fact that when one understands the very same things, the movement contrary to reason sometimes occurs, and sometimes does not, the cause is that sometimes the affectable matter[33] is present, but sometimes it is not present in the suitable
704^{a}1 quantity or quality.

As regards the parts of each animal, as regards soul, and further as regards perception,
704^{b}1 sleep, memory, and the common movement, we have given the causes; it remains to speak about generation.

33. I.e., the matter that is receptive of the form coming from the understanding.

ON THE PROGRESSION OF ANIMALS*

De Incessu Animalium

1
What Is to Be Explained

As regards the parts that are useful to animals for movement with respect to place, one must investigate due to what sort of cause each part is such as it is and for the **704ª5** sake of what it belongs to them, and also the differences in the parts of one and the same animal and compared to the parts of animals different in kind.

But, first of all, let us grasp how many issues are to be investigated. One of these is what the fewest points are by means of which animals move; then, why blooded animals move by means of four points, bloodless animals by means of more than four; and, in general, why some animals are footless, some two-footed, some four-footed, and some many-footed, and why, as many as have feet have an even number of them. More generally, why the points by means of which animals move are even in number.

A further issue is due to what sort of cause the human being and the bird are two-footed while the fishes are footless, and why the human being and the bird, although they are two-footed, have contrary bendings of their legs. For the human being bends its leg toward the circumference,[1] the bird toward the concave, and the human being bends its legs and arms in contrary directions with respect to itself: arms toward the concave while knees toward the circumference. And the four-footed live-bearing animals bend their legs in the contrary ways with respect to human beings, and also in contrary ways with respect to themselves: they bend front legs toward the convex part of the circumference, back legs toward the concave part. Further, those four-footed **704ᵇ5** animals that are not live-bearing but egg-laying bend their legs in a way special to them, that is, laterally and away from their body. An additional issue is due to what cause the four-footed animals move their legs diagonally.

One must get a theoretical grasp on the causes of all of the above facts, and on the causes of any other similar facts; for *that* things are this way is evident from the investigation of nature, but *why* they are this way must now to be investigated.

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* Translated by Andrea Falcon. Text: P. Golitsis in A. Falcon and S. Stavrianeas (eds.), *Aristotle on How Animals Move* (Cambridge, 2021).

1. The circumference is to be imagined as drawn around the body of the human being. Since Aristotle contrasts bending toward the circumference and bending toward the concave, we can take "toward the circumference" as an abbreviation for "toward the convex part of the circumference."

2
Explanatory Starting-Points

We begin our investigation by positing those [starting-points] that we are accustomed to use often in our methodical inquiry into nature, assuming that things occur in this manner in all nature's works.

One of these [starting-points] is that nature does nothing pointlessly, but always does what is best from among the available possibilities for the substance of each kind of animal. That is why if it is best in a certain way, it is also this way in accord with nature.

Further, one should grasp how many and what sort of dimensions of magnitude are present in what sorts of animals. There are six dimensions but three pairs: the first is the up and the down, the second is the front and the back, and the third is the right and the left.

In addition, one should grasp that the starting-points of movement with respect to place are pushing and pulling. These are, then, intrinsic movements, whereas what is carried by something else is moved coincidentally; for what is carried by something else does not seem to move itself but rather to be moved by something else.

3
External Supporting Point and Internal Complexity

With these determinations in place, let us speak about the issues that come next in order. Some of the animals that change with respect to place do so by means of their whole body all at once, like the jumpers, others by means of their parts, like each of the animals that moves by progression. In both these cases of change, what moves always changes while supporting itself against what is beneath it. That is why when this thing gives way too quickly for what is making its movement on it to support itself, or when it offers no resistance at all to what is moving, then nothing can move itself on it. For even the jumper makes its jump both while supporting itself against its own upper part and against what is under its feet; for its parts offer some resistance to one another at the joints—and, more generally, what presses presses against what is pressed. (That is why pentathletes jump further with weights than without, and runners run faster if they swing their arms; for a sort of support is generated in the extension of the arms toward the hands and the wrists.)[2]

What moves always makes its change by using at least two instrumental parts: the first, as it were, compressing, and the second compressed. The part that remains still is compressed because of the carrying, while the part that is raised is extended

2. In the extension of the arms there is some support of the forearms on the hands.

by carrying the weight. That is why nothing that is without parts can move in this way; for it does not have the division between what is to be acted upon and what is to act on it.

4
Dimensions

The dimensions by which animals are naturally determined are six in number: the up and the down, the front and the back, the right and the left. Further, all living beings have the up and the down, for the up and the down are found not only in animals but also in plants. But the up and the down are distinguished by [their] work, and not only with respect to their position relative to the earth and the heaven. For where the distribution of nourishment and growth is from in each, this is the up; and where it, ultimately, comes to an end, this is the down. For the one is a sort of starting-point, **$705^{b}1$** the other a sort of end-point; and the up is a starting-point. And yet in the case of plants, at any rate, the down might seem to be the more proper one; for the up and down do not have the same position in them as in animals. But though in relation to the universe they do not have the same position as in the animals, with respect to their work they are the same. For the roots are the up for plants; for it is from the roots that the nourishment is distributed to what grows, and it is by means of them that the plants get it, just as the animals do by means of their mouth.

As to the things that are not only alive but also animals, to all things of this sort the front and the back belong. For they all have perception, and it is in accord with it that the front and the back are determined; for the parts in which perception is naturally present and from which it derives, these are the front, while the opposite parts are the back.

Those animals that not only have a share in perception but are also able to make a change with respect to place by themselves, in addition to the dimensions already enumerated, are determined by the left and the right. Like those discussed earlier, each of them is distinguished by work rather than position; for the starting-point in the body from which change with respect to place by nature derives is the right in each animal, while what is opposite to this, and naturally follows its lead, is the left.

The distinction between the right and the left is more articulated in some animals than in others. For those that use instrumental parts (I mean feet, wings, or any other such part) to make the change mentioned have the aforesaid distinction more clearly articulated around these parts. Those that do not use such parts but proceed by making divisions in their bodies, as do a few of the footless animals (for example, snakes, the caterpillar kind, and also the so-called earthworms) have the division mentioned, though not as perspicuously.

A sign that the starting-point of movement is from the right is also the fact that all human beings carry loads on their left shoulder; for in this way it is possible for what

carries the load to be moved, while the mover is set free. That is also why it is easier to
706ᵃ1 hop on the left leg; for the right is naturally the mover, and the left the moved. So the load too has to be placed not on the mover but rather on the moved; if it were placed on the mover and the starting-point of movement, either it would not be moved at all or it would be moved with greater difficulty. A sign that the right is the starting-point
5 of movement is also the way in which people advance; for they all lead with the left parts, and after standing still, put the left parts forward in preference, unless it is done otherwise by luck; for they move not with the part they put forward but with the one with which they step off; also, they defend themselves with the right parts.

Due to this cause too the right parts are the same in all animals; for the starting-
10 point from which movement derives is the same for all of them, and has its position in the same place in accord with nature. The right is indeed the starting-point from which movement derives, and that is why the spiral-shelled animals have their shells on the right; for they do not move in the direction of the spiral, but they all proceed
15 in the opposite direction; for instance, the purpuras and the trumpet-shelled animals. Since, then, all animals move from their right parts, and the right part moves in the same direction as the animals themselves, it is necessary for all animals alike to be right-sided.

Human beings have their left limbs detached more than any other animal because, among animals, they are most in accord with nature; and by nature it is also better
20 for the right to be separated from the left. That is also why the right limbs are most right in human beings: since the right limbs are separated, it is reasonable that the left limbs should be less easy to move and most detached in them. The other starting-points too are most in accord with nature and most separated in the human being,
25 namely, the up and the front.

5
Distribution of Feet and Cosmic Alignment

All the animals that, like human beings and birds, have their up separated from their front are two-footed (two of the four points are wings in one, hands and arms in the other). But those that have their front and their up in the same place are four-footed,
30 many-footed, or footless. I call "foot" a part [of the body], connected with a point on the ground, capable of causing movement with respect to place, and, indeed, the feet (*podes*) appear to have gotten even their name from the ground (*pedon*).

Some animals have their front and their back [parts] in the same position—for
706ᵇ1 example, the soft-bodied animals and the hard-spiral-shelled animals. These were discussed previously elsewhere.[3]

3. The most likely reference is *PA* 684ᵇ14–16.

Since there are three places in the universe—an upper, an intermediate, and a lower—the two-footed animals have their upper part aligned with the upper part of the universe, the many-footed and footless animals have it aligned with the intermediate part, and the plants with the lower part. The cause of this is that plants are stationary, toward the nourishment is the up, and their nourishment is taken from the earth. The four-footed animals [have their upper part] aligned with the intermediate region, as do the many-footed and footless animals, because they are not upright. But the two-footed animals have theirs aligned with the upper part [of the universe] because they are upright. This is most of all true in the case of the human being; for its two-footedness is most in accord with nature.

And it is reasonable that the starting-points arise from these parts; for the starting-point is estimable, and the up is more estimable than the down, the front more than the back, and the right more than the left. But it is also correct to state the reverse about them, that because the starting-points are in them these parts are more estimable than their opposites.

6
The Centralized Progressive Movement System

From what has been said it is evident that the starting-point of movement is from the right. However, for anything continuous, of which one part is moved while another remains at rest, to be able to move as a whole while one part stands still, it is necessary, insofar as both parts are moved with contrary movements, for there to be some common part in virtue of which these parts are continuous with each other, and for the starting-point of movement of each of the two parts to be located there, and likewise the starting-point of rest, [and since] with respect to whichever of the oppositions mentioned,[4] a special movement belongs to each of the contrary parts, it is clear that there exists a common starting-point at the natural juncture of the parts in question. I mean of the ones on the right and the left, the ones up and down, and the ones front and back.

The division of the front and back is not of the sort that applies to what moves itself, because there is no animal for which backward movement is natural, nor does the moving animal have any distinction in virtue of which it can make a change in each of these directions; but there is one in accord with the right and left, the up and down. That is why all animals that proceed by using instrumental parts have **707^{a}1** them distinguished not by the difference of the front and back but by the remaining two pairs. By both pairs, but first by the one that distinguishes with respect to the right and left, because it is necessary for this one to be present as soon as there is a

4. I.e., the three pairs of dimensions introduced at 704^{a}19–22.

distinguishing into two, while the other one[5] first appears when there is a distinguishing into four.

Since, then, the up and the down and the right and the left are connected with one another by the same common starting-point (I mean the starting-point that controls their movement), it follows that in everything that is going, properly, to make a movement in each part, the cause of all the said movements must be arranged in a certain definite position with reference to the distances from the aforesaid starting-points (both those arranged co-ordinately in pairs as well as those arranged in a series). This is the common starting-point from which the movements of the right and left, and similarly of the up and down, arise in the animal, and each animal has a starting-point of this sort at a place that is related in much the same way to each one of the starting-points in the parts described.

7
Points of Movement

It is evident, then, that movement with respect to place belongs either only or above all to those animals that make their change with respect to place either by means of two or four points. So, since this pretty much happens above all in the case of the blooded animals, it is evident that none of the blooded animals can move by means of more than four points, and if an animal is moving naturally by means of only four points, this animal is necessarily blooded.

What occurs in animals is also in accord with what was just said. For none of the blooded animals that is divided into a plurality of parts can continue to live for any length of time worth mentioning; nor can it partake of the movement with respect to place in accord with which it was moving while it was continuous and non-divided. But a few of the bloodless and many-footed animals, when they are divided, can continue to live for quite a while in each of their [severed] parts, and they can indeed move with precisely the same movement with which they were moving before they were divided—for example, the so-called centipedes, and other insects with an elongated body; for in all these animals even the back part makes its progression in
707b1 the same direction as the front part. And the cause of their continuing to live when they are divided is that each of them is constituted as if it were something continuous, composed of many animals together.

Why it is this way is evident from what was stated previously.[6] For the animals that are constituted most in accord with nature move naturally by means of two or four points, and likewise also those blooded animals that are footless. For they too move by means of four points through which they make their movement. For they move

5. I.e., the up and the down.
6. 707a6–16.

forward by using two bends; for the right and left are found in the front as well as in the back on the wide side of each of their bends: the front right and the front left in the part that is near the head, the back points in the part that is toward the tail. They seem, though, to be moving by means of two points by touching [the ground] in the front and the back. The cause is that their body is narrow in breadth, since in these animals too the right part leads the movement, and it is balanced by the movement of the back, as in the four-footed animals.

The cause of their bends is their length; for just as tall people walk with their body curved, and their right shoulder leading forward (for their left hip is inclined rather toward the back and their middle part becomes hollow and curved), so one should understand that the snakes too move on the ground with their body curved. Here is a sign that the snakes move just like the four-footed animals; for they alternate the concave and the convex in a part; for when the left of their front parts is leading again, the concave comes to be from the contrary bend; for the right becomes inner again. Let the front point on the right [Fig. 1] be A, and that on the left B, and the back point on the right C, and that on the left D.

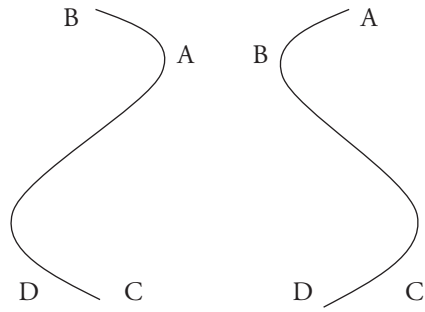

Fig. 1

It is in this way that, among terrestrial animals, the snakes move, and, among aquatic animals, the eels, the conger eels, the torpedo fish, and all the other more snake-shaped animals. Except that some of these aquatic animals have no fins, like the muraenas; still, they use the sea in the way the snakes use both the land and the sea (for the snakes swim in the same manner as when they move on land). Other aquatic animals have only two fins, like the conger eels, the eels, and a certain mullet kind that lives in the lake in Siphae. Because of this, those that are accustomed to living on land—like the eel kind—move with fewer bends in water than on land. The mullets that have only two fins equalize the four points in water by means of their bending.

8
Number of Feet

The cause of footlessness in the snakes is that nature does nothing pointlessly, but rather does everything with a view to achieving what is best from among the available possibilities for each animal, preserving the special substance and essence of each. Further, what we said previously[7] is relevant: none of the blooded animals can move by means of more than four points. From these considerations, it is evident that none of the blooded animals whose length is out of proportion to the rest of their bodily constitution, like the snakes, can possibly have feet. For they cannot have more than four points of movement (for then they would be bloodless); but if they had two or four feet, they would be almost completely incapable of movement, so slow and useless would their movement necessarily be.

Every footed animal has of necessity an even number of feet. For all the animals that make their change with respect to place by using only jumping have no need of feet for this sort of movement, at any rate. For those that use jumping, but for whom this sort of movement is not sufficient, but instead need progression in addition, it is clear that for some of them it is better this way,[8] while for others progression would be impossible otherwise.[9] Since a change of this sort is made part by part, and not by the whole body all at once as in jumping, it is necessary, in turn, for some of the feet to remain at rest and for others to move, and for the animal to move and to rest by means of feet standing in opposition, shifting its weight from the feet that move to those that stay at rest. This is also why no animal can walk by using either three feet
708b1 or only one. For with only one the animal would have no point of support at all on which it could rest the weight of the body, while with three it could rest only in one of two opposite pairs, so that it would necessarily fall while trying to move in this way.

But in animals that are many-footed, like the centipedes, it is possible for progression to come about also on an odd number of feet, as they in fact appear to do if one incapacitates one of their feet, because they can remedy the incapacitation in one row of feet with the remaining number of feet present on each of their two sides. For what happens to these animals is, as it were, a dragging along of the incapacitated part by the other feet rather than proper walking. It is nonetheless clear that these animals too would make their change in a better way with an even number of feet, that is, with no foot missing, but rather with all of them in their opposite rows. For in this way they could restore [the even distribution of] their weight, and they would not sway more to one side than the other if they had all their opposite points of support and not one of the opposite places empty. And

7. 707a19–23.
8. I.e., with an even number of feet.
9. Omitting διότι . . . πόδας.

an animal, when progressing, advances from each one of the two sides alternately; for it is in this way that the return to the initial configuration is secured.

That all animals have an even number of feet, and due to what cause, has now been stated.

9
Bending

That if nothing were at rest, there would be no bending or straightening is evident from the following considerations. For bending is the change from what is straight to what is curved or angled, while straightening is the change from either of these to what is straight. In all the changes mentioned, it is necessary for the bending or straightening to come to be in relation to one point.

Moreover, without bending there could be neither walking nor swimming nor flying. For footed animals stand and take their weight alternately on one or the other of their opposite legs, and as one leg strides forward the other must necessarily make a bend; for the opposite legs are by nature of equal length, and the one that is under the weight must be straight, at right angles, as it were, to the ground. When the other leg strides forward, it becomes the hypotenuse of a right-angled triangle, its square equal to the square on the other side together with the square on the base. But since the **709^{a}1** legs are equal, the one at rest must bend, either at the knee or at the joint (if there is any knee-less animal that walks). Here is a sign that this is the case; for if one were to walk on the ground along a wall, having attached to one's head a reed dipped in ink, the line described [by the reed] would not be straight but zigzag, because it would go lower when one bends and higher when one stands and raises oneself.[10]

It is nonetheless possible to move even if the leg has no bend, as when children crawl. (This was the old account of the movement of elephants, but it is not true.[11]) Movements of this sort also involve bending, either in the shoulders or in the hips. But nothing could walk upright in this way continuously and safely, but would only move like men in the wrestling schools advancing through the dust on their knees, for the upper portion of the body is big, so the legs must be long; but if this is so, there must be bending. For since the standing position is perpendicular [to the ground], if the leg moving forward cannot bend, one will either fall, as the right angle becomes less than ninety degrees, or else one will not advance at all. For if one leg is at right angles and the other is advanced, the latter will be greater, though it is equal; it will have the capacity to be equal to both the supporting leg and the hypotenuse of the right-angled triangle. It is necessary, therefore, for what advances to bend, and while bending one leg, extend the other, incline forward at the same time, make a

10. The transmitted text is corrupt. Reading ἔχων ἐν τῇ κεφαλῇ αὐτοῦ κάλαμον τοῦ τοίχου ἁπτόμενον.
11. *HA* 498^{a}2–13.

stride, and remain above the perpendicular; for the legs form an isosceles triangle and the head becomes lower when it is perpendicular to the base of the triangle.

Some of the footless animals advance by undulations (this happens in two ways; for some do their bending on the ground, like the snakes, while others do so upward, like caterpillars), and undulation is bending; others move by oozing, like the so-called earthworms and leeches. These animals advance with one part leading the way, then draw the remainder of the body to it, and they change from place to place in this manner. It is evident that if the two lines they make were not greater than the subtending one, the undulating animals would not be able to move; for when the bend is extended, it would have made no advance if it subtended an equal line; but in fact the line is longer when the bend is extended, and when this stands still, the animals draw up the rest.

In all the changes mentioned, what moves advances by first extending itself straight and then by curving itself; it straightens itself with its leading part and curves itself with the parts that follow. All the jumping animals too make the bend in the lower part of their body, and in this way jump. And those that fly and those that swim fly or swim, in the one case, by straightening and then bending their wings, in the other case their fins. Among the latter, some have four fins and others, those with a rather elongated shape, have only two (for instance, the eel kind). They swim by substituting a bending of the rest of their body for the missing pair of fins to complete their movement, as was said previously.[12] Broad fish use, on the one hand, the broad part of their body in place of [the second pair of] fins and, on the other, two fins. Fish that are altogether broad, like the ray, do their swimming with the actual fins and with the outer periphery of their body, by bending and straightening.

10
Winged Animals

Someone might raise a puzzle, though, as to how birds move by means of four points, either when flying or when walking, on the supposition that it was said that all blooded animals move by means of four points. However, that is not what was said, but rather that they move by *not more* than four points.[13] Nonetheless, birds could not fly if their legs were removed, nor could they walk without their wings, since not even a human being could walk without moving its shoulders a little. But, at any rate, all do make their change by means of bending and straightening, as was said;[14] for they all proceed upon what underlies them as if the latter

12. 709a24–31.
13. 707a20–21.
14. 708b26–27.

were giving way on them, up to a point.[15] So even if bending does not occur in another part, it is nonetheless necessary for it to occur, at any rate, from where the starting-point is—of the wing-like membranes in whole-winged animals, of the feathered wing in birds, and of the analogous part in other animals, such as the fishes. And for some animals, like snakes, the starting-point of the bending is in the joints of their body. **710^a1**

The tail in winged animals is for staying on course in flight, like the rudders in ships. And it is necessary for the tail too to bend where it grows together with the body. That is why whole-winged animals, and some of the split-winged animals whose tails are not naturally suited for the use just mentioned, such as peacocks and the domestic fowl, and in general those birds that are not good flyers, cannot move in a straight course. None of the whole-winged animals has unconditionally speaking a tail; as a result, they are carried along like a rudderless ship, and each of them bumps against anything they chance upon, as do both the ones with a wing case[16] (like dung beetles and cockchafers) and the ones without a wing case (like bees and wasps). And in birds that are not good flyers the tail is useless—for example, the *porphuriôn*,[17] the herons, and all the birds that are able to swim. In place of the tail, they fly by stretching out their feet, and use their legs in place of their tail for staying on course in flight.

The flight of the whole-winged animals is slow and weak because the nature of their wings is not in proportion to the weight of their body, but instead the weight is great while the wings are small and weak. Just as if a cargo ship, then, were to try to use oars to navigate, so in this way do these animals use flight. The weakness of the wings themselves and also of their outgrowth contribute to some extent to what has been described. Among birds, the peacock's tail is sometimes useless[18] because of its size, and sometimes of no benefit because of the shedding.

But birds are in a condition contrary to the whole-winged animals with respect to the nature of their wings, and above all the swiftest flyers among them. The crook-taloned birds are of this sort; for, in them, swiftness of flight is useful for their mode of life. And the remaining parts of their body seem to conform to their specific movement. In all of them, the head is small, the neck not thick, and they have a strong, sharp breast—sharp so as to be forceful, as if it were the prow of a fast-sailing ship, and it is strong due to the nature of its flesh, in order to be capable of pushing away the air hitting against it; and it does this easily and without effort. The back parts are light and come together again to a narrow point, in order that they may follow the front parts without dragging the air because of their breadth. **710^b1**

15. 704^a8–12, *MA* 698^b15–18.
16. *HA* 490^a13–21.
17. *HA* 509^a11, 595^a12.
18. I.e., for flying.

11
Two-Footedness

As regards these matters, let it be determined this way. But why it is necessary for an animal that is to walk upright to be two-footed, and for it to have the upper parts of its body lighter, and those that lie under them heavier, is evident. For only if arranged in this way would the animal be able to carry itself easily. This is why a human being, being the only upright animal, has the biggest and strongest legs among footed animals in proportion to the upper parts of its body. What happens in the case of little children also makes this evident; for they are unable to walk upright because they are all dwarf-like[19] and have the upper parts of their body bigger and stronger in proportion to their lower parts. But as they grow older, their lower parts receive more growth until they acquire the appropriate size, and at that point children make, by means of their bodies, their walking upright.

Birds, since they are light, are two-footed because their weight is located at the back, just as people make bronze horses with their front legs raised up. But above all the cause of their being able to stand, although they are two-footed, is that they have a haunch[20] like a thigh, and of such a size that they seem to have two thighs, one in the leg before the joint, and another going toward this part from the rump; it is not a thigh, though, but rather a haunch. For if it were not of such a size, there would be no two-footed bird. For, just as in the human beings and in the four-footed animals, the thigh and the rest of the leg would then begin right from the haunch, the latter being short; with the result that the whole body of birds would be inclined forward too much. But as things stand, being long, the haunch stretches up all the way to beneath the middle of the abdomen, so that from there the legs, having been put underneath as a support, carry the entire body.

It is also evident from these considerations that it is not possible for the bird to be upright in the way that the human being is. For the nature of wings, as birds have their body in fact arranged, is useful to them; but it would be useless if they were upright, like the winged cupids that people paint. At the same time, it is also clear from what has been said that neither a human being nor anything else with this sort of shape can be winged, not only because it will then move by means of more than four points, despite being blooded, but also because having wings would be useless to them when they move in accord with nature. And nature does nothing contrary to nature.

19. *PA* 686ᵇ2–687ᵃ2.
20. *PA* 695ᵃ1–13.

12
Leg Bending in Human Beings and Four-Footed Live-Bearing Animals

It was stated previously[21] that if there were no bending in the legs or in the shoulders and hips, none of the blooded footed animals could advance; that there would be no bending if nothing were at rest;[22] that human beings and birds, although both are two-footed, bend their legs in contrary directions;[23] and further that the four-footed animals bend their legs in contrary directions both with respect to themselves and with respect to the human beings.[24] For human beings bend their arms toward the concave and their legs toward the convex, while the four-footed animals bend their front legs toward the convex and their back legs toward the concave; and birds do likewise. The cause of this is that nature crafts nothing pointlessly, as was said previously,[25] but everything with a view to the best from among the available possibilities.

So, since in all the animals that in accord with nature change with respect to place by means of legs, when each leg is standing, the weight is on it, but when the animals move forward, the leading foot must be light by virtue of its position, and the progression continuing without interruption, the weight must fall on this foot again, it is clearly necessary for the leg, after being bent, to become straight again, with the point of the foot that has been thrust forward and the shin at rest. And it is possible for this to happen and, at the same time, for the animal to advance, if the leading leg has a forward bend; but it is impossible if the leading leg has a backward bend. For in the former way the extension of the leg will take place while the body is moving forward, but in the latter way while the body is moving backward. Further, if the bend were backward, the positioning of the foot would take place through two movements that are contrary to each other: one backward and the other forward. For it is necessary, **711b1** in the bending together of the leg, for the last part of the thigh to advance backward and for the shin to move the foot forward from the point of bending. By contrast, if the bend is forward, the progression mentioned will take place not by contrary movements but by a single forward movement.

The human being, then, because it is two-footed and in accord with nature makes its change with respect to place by means of legs, bends its legs forward due to the cause mentioned, and its arms toward the concave, as is reasonable; for the arms would be useless, were they bent in the contrary direction, for the employment of the hands and also for taking food.

The four-footed live-bearing animals must bend their front legs toward the circumference, since they lead the progression and are situated in the front part of

21. 708b24–709a7.
22. 708b21–24.
23. 704a18–20.
24. 704a22–b5.
25. 704b15–17, 708a9–12.

their bodies, due to the very same cause as the human beings also do; for in this respect they are similar. That is why the four-footed animals also bend their front legs forward in the way just stated. For if in fact their bending takes place in this way, the animals will be able to raise their feet from the ground high in the air. But if they bent their front legs in the contrary direction, they would raise them from the ground only a little, because the entire thigh and the joint from which the shin naturally grows would be underneath the belly as the animal moves forward. On the other hand, if the bending of the back legs were forward, the raising of the feet would be like that of their front legs (for the bending that is in accord with leg lifting would be short in these animals, since both the thigh and the joint would fall under the abdomen). But if they bend their back legs backward, as they actually do, nothing impedes their progression in such a movement of the feet. Further, for those among them that are nursing, and with a view to this sort of service, it is necessary or better, at any rate, for their legs to be bent in this way; for it would not be easy for them to have their children underneath and to protect them if their legs were bent inward.

13
Limb Bending

712a1 There are four ways of bending when the legs are taken in pairs; for it is necessary for both front and back legs either to bend toward the concave, as in A [Fig. 2], or in the contrary way, toward the convex, as in B, or else in converse ways, not both in the same direction, but rather the front legs toward the convex and the back legs toward the concave, as in C, or in a way contrary to this, each pair of legs toward the convex in relation to the other with their concave facing outward, as in D.

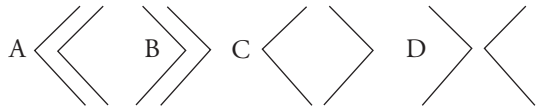

Fig. 2

None of the two-footed or four-footed animals bends its legs as in A or B; the four-footed animals bend their legs as in C, whereas none of the four-footed animals, except the elephant, bends its legs as in D. The human being bends its arms and legs in this way: it bends its arms toward the concave and its legs toward the convex.

The bending of limbs is always alternately and in contrary directions in human beings: the elbow bends toward the concave, while the wrist toward the convex, and again the shoulder toward the convex. It is likewise too with the legs: the hip bends toward the concave, the knee toward the convex, and the foot in a contrary

way toward the concave. And clearly the lower limbs bend in a contrary way to the upper limbs; for the starting-point of movement bends in contrary directions: the shoulder bends toward the convex, and the hip toward the concave. That is also why the foot bends toward the concave, and the wrist of the hand toward the convex.

14
Diagonal Leg Movement in Four-Footed Animals

The bendings of the legs are arranged in this way and due to the causes stated. The back legs move diagonally relative to the front legs: after the right front leg, four-footed animals move the left back leg, then the left front leg, and after it the right back leg. The cause of this is that if they moved the front legs at the same time and first, they would be strained, or else their walking would even be a case, as it were, of falling forward with their back legs dragged after. Further, such a movement would not be progression but jumping, and it would be difficult to produce continuous change by jumping. Here is a sign of this; for all the horses that in actual fact move in this way quickly get tired—for example, procession horses. Because of these things, then, the four-footed animals do not make their movement separately with their front and back legs, while if they made it with both right legs first, they would be outside of their supports, and would fall. If it **712b1** is necessary, then, for them to move in one or another of these two ways or else diagonally, and neither one of the first two ways is possible, it is necessary for them to move diagonally. For by moving in the way stated they can avoid suffering either one of these things.[26] That is why horses and all animals of this sort stand after having advanced with their legs diagonally, and not with both right or both left legs at the same time.

And those animals with more than four feet make their movement in the same way; for in the next set of four feet, the back legs always move diagonally relative to the front legs. This is clear in animals that move slowly. Crabs move in the same way too, for they are among the many-footed animals. For they too always move in accord with the diagonal, in whichever direction they make their progression. In fact, this animal makes its movement in a special way, for it is the only animal that does not move forward but rather obliquely. But since what is forward is distinguished in relation to the eyes, nature has made the eyes [of the crab] able to follow its legs; for their eyes move obliquely, so that, in a way, crabs too move, because of this, forward.

26. I.e., jumping and tiring, or straining and falling.

15
Leg Bending in Birds and Four-Footed Egg-Laying Animals

The birds bend their legs just as the four-footed animals do; for in a way the nature of their legs is pretty much the same; for in the birds wings are in place of front legs. That is also why they are bent in the same way as the front legs of four-footed-animals, since when it comes to their progressive movement, the starting-point of movement that is in accord with their nature is from the wings; for flight is their proper movement. That is why, if its wings were removed, no bird would be able to stand or move forward.

Further, because the bird is two-footed and not upright, and the front parts of its body are lighter, it is either necessary or better for its being able to stand that the thigh be placed under the animal, as is in fact the case. (I mean growing toward the back.) But if the thigh must be placed in this way, it is necessary for the bending of the leg to be toward the concave, just as in the case of the back legs of four-footed animals, and due to the same cause that we stated[27] in the case of the four-footed live-bearing animals.

In general, in the birds, the flying animals that are whole-winged, and the animals that swim in water (those that make their progression in water by means of instrumental parts), it is not difficult to see that it is better for the attachment of the parts mentioned to be oblique, just as appears to be in actual fact the case in the birds and the whole-winged animals. This very same condition also holds for the fishes. The feathered wings in the birds, the fins in the aquatic animals, and the wing-like membranes in the whole-winged animals are attached obliquely. For in this way they can make their movement most quickly and most efficiently, the ones by dividing the air, the others by dividing the water; for the back parts of their body can follow forward too, since they are carried along in a medium that gives way, the ones in water and the others in air.

As for the egg-laying four-footed animals that are hole-dwellers (for example, the crocodiles, the lizards, the geckos, the freshwater turtles, and the sea turtles), they all have their legs attached obliquely and stretched out upon the ground, and they bend them obliquely, because in this way their legs are useful for ease of retiring underground and for sitting on their eggs and protecting them. Since their legs project outward, these animals must tuck in their thighs and put them underneath themselves in order to make their whole body rise. But when this happens, they cannot bend their legs in any other way than outward.

27. 711b12–28.

16
Leg Bending in Bloodless Animals

We stated earlier[28] that the footed animals that are bloodless are many-footed, and none is four-footed. That it is necessary for their legs, except for the extreme pairs, to be attached obliquely, to have their bending upward, and to be somewhat bowed backward is evident. For in all animals of this sort, the intermediate legs must both lead and follow. If, then, the legs were underneath them, they should bend both forward and backward; forward to lead, and backward to follow. But since their **713b1** legs must do both, because of this they are bowed and also bend obliquely, except for the extreme pairs; these move more naturally: one pair of legs leads, the other pair follows. Further, their legs are bent in this manner also due to their number; for in this way they would be less likely to impede each another in their movement and to hit against one another. And they are bow-legged because either all or most of these animals are hole-dwellers; for it is not possible for animals living in this way to be tall.

17
Leg Bending and Leg Movement in Crabs

Crabs have the most extraordinary nature of all the many-footed animals; for they do not progress forward except in the way stated previously,[29] and they alone among animals have many leading feet. The cause of this is the hardness of their feet and the fact that they use them not for the sake of swimming but of progressing on land; for their mode of living is to proceed along the ground.

All the many-footed animals, then, have their bends obliquely, just like those four-footed animals that are hole-dwellers—for example, the lizards, the crocodiles, and many of the four-footed animals that lay eggs are of this sort. The cause is that they live in holes, some only during the breeding season, and others throughout their entire life. But the legs of all the other many-footed are bowed because they are soft-skinned; the legs of the crayfishes, though, being hard-skinned, are used for the sake of swimming, not of walking.

The bending of the crab's legs is oblique, and they are not bowed as in the four-footed egg-laying animals and the bloodless many-footed ones; the legs are hard-skinned and hard-shelled because the crab is not a swimmer and lives in holes; for its mode of life is on the ground. And it is round in shape and does not have a tail like the crayfish; for a tail is useful to the crayfish for swimming, but the crab is not a swimmer. And the crab alone has the side like the back because of having

28. 707a20–23.
29. 712b13–21.

many leading feet; the cause of this is that its legs do not bend forward and are not
714ᵃ1 bowed. The cause of their not being bowed was stated previously;[30] the skin of the crab is hard and is like that of a hard-shelled animal. It is necessary, because of this, for it to lead off with all its legs and obliquely: obliquely, because the bending is
5 oblique; with all its legs, because otherwise those at rest would be an impediment to those moving.

18
Animals That Live in Water

The *psetta*-like fishes[31] swim in the way one-eyed humans walk; for their nature is distorted. Web-footed birds swim with their feet, and because they take in air and
10 breathe, they are two-footed; but because they have their mode of life in liquid, they are web-footed; for their feet, since they are of this sort, serve them in place of fins. They have their legs, not in the center of their body like the other birds, but placed rather toward the back; for since they are short-legged, their legs, being set back, are useful for swimming. Birds of this sort are short-legged because nature has taken
15 away from the length of their legs and added to their feet, that is, it has provided the legs with thickness instead of length and the feet with broadness; for, being broad, they are more useful than if they were long for pushing away the water when they are swimming.

20 It is also reasonable that winged animals have feet while fishes have none. For the mode of life of the former is on dry land and they cannot always remain in the air, so they necessarily have feet. But the mode of life of the fishes is in liquid, and they take in water, not air. Their fins, then, are useful for swimming, whereas feet would be useless. If they had both, they would be bloodless. But the birds in a way resemble the fishes; for the birds have their wings in the upper part, while the fishes have two
5 fins near the head; and, while the birds have feet on their underpart, most of the fishes have fins on their underpart near their front fins; also, the birds have a tail, the fishes a tail fin.

19
Hard-Shelled Animals

As regards hard-shelled animals, one might raise a puzzle as to what their movement is, and if they have no right and left side where they move from; for they do appear
10 to move. Or must one posit that this entire kind is deformed—moving as a footed

30. 713ᵇ14–16.
31. *HA* 538ᵃ20.

animal would do if one were to cut off its legs—like the seal[32] and the bat; for these animals are four-footed, but in a bad way. The hard-shelled animals do move, then, but they do so in a way contrary to nature; for they are not really able to move, but rather taken as animals that are stationary and attached, they can move, and taken as animals that move by progression, they are stationary.

Crabs too have their right side defective, since they do have it. The claw makes this clear; for the right claw is bigger and stronger, as though the right and the left wished to be differentiated.

As for the parts, both the other parts and those that have to do with the progression of animals and with all change with respect to place, things are arranged in this way. With these determinations in place, the next thing is to get a theoretical grasp on the soul.[33]

32. *HA* 498ᵃ31–ᵇ4, *PA* 697ᵇ1–13.

33. The order of treatises suggested by this epilog is *PA*, *IA*, *DA*, but *PA* refers back to *IA* three times (690ᵇ15, 693ᵃ17, 696ᵃ10–13), and *DA* seems to logically precede *PA*, making the precise order difficult to determine with certainty.

ON THE GENERATION OF ANIMALS*

BOOK 1

1.1
The Focus of the Treatise; Male and Female as Starting-Points

The other parts present in animals have been spoken about,[1] both in common and with respect to the special affections of each particular kind separately, and what way each part is due to this sort of cause—I mean, the for-the-sake-of-which; for there are four underlying causes: the for-the-sake-of-which as end, the account of the substance (and these must be taken pretty much as one[2]), third and fourth, the matter and where the starting-point of the movement comes from. The others, then, have been spoken about (for the account and the for-the-sake-of-which as end are the same, and the matter for the animals is their parts—for the animal as a whole, the non-uniform parts, for the non-uniform parts, the uniform ones, and for these, the so-called elements of bodies), but it remains to speak about the parts that contribute to the generation of animals, about which nothing was determined previously, and about what sort of starting-point the cause of the movement is. And to investigate this latter cause and to investigate the generation of each animal is in a way the same. That is why the account has brought them together as one, by putting these parts at the end of our accounts of the parts, and the accounts of the starting-point of generation next after them. **715ª1**

Among the animals, some come to be from the copulation of female and male, namely, in those kinds in which there exist both the female and the male; for they do not exist in all, but rather in those blooded ones, with few exceptions, in which the male and the female are completed, and in those bloodless ones which, though some have the female and the male, so that they generate offspring of the same kind as themselves. Others, though they do generate offspring, the offspring are certainly

* Translated by C. D. C. Reeve. Text: H. J. Drossaart Lulofs, *Aristotelis De Generatione Animalium* (Oxford, 1965).

1. *PA*.

2. *PA* 639ᵇ11–21.

not of the same kind. The ones that come to be not from animal copulation but from putrefying earth and from residues[3] are of this sort.[4]

Generally speaking, however, among all those that are capable[5] of changing with respect to place, whether by swimming, flying, or walking, the female and the male exist—and this applies not only to the blooded ones, but also to some bloodless ones. And among the latter, sometimes it applies to the whole kind (for example, the soft-bodied animals and the soft-shelled animals), but in the insect kind [only] to the majority. Among these, the ones that come to be from the copulation of animals of the same kind also generate in accordance with sameness of kind. On the other hand, those that come to be not from animals but from putrefying matter generate something of a distinct kind, and what is generated is neither female nor male. Some of the insects are of this sort.[6] And this happens reasonably; for if from the ones that are not generated from animals, animals came to be by copulating, if these were of the same kind as themselves, then from the start the coming to be of their procreators should have been the same way (for this is what we reasonably expect; for it is evident that it is so in the case of the other animals). But if they are not of the same kind but capable of copulating, there should again be generated from them things of a distinct nature, and again from these something of a distinct nature, and this should go on without limit. Nature, however, avoids the unlimited; for the unlimited is without an end, while nature always seeks an end.

Those that do not move by walking, like the hard-shelled animals and those that live by being attached to something, because their substance is much the same as that of the plants, just as in the latter ones, so in these, the female and the male do not exist—although they are in fact said to be female or male by way of similarity and by analogy; for the difference of this sort that they exhibit is small. For even in plants we find in the same kind some trees that are fruit-bearing and others that, while not bearing fruit themselves, contribute to the concocting of what is borne by the others, as happens, for example, with the fig and the caprifig.[7]

{It is the same way in plants too; for some come to be from seeds, others, as it were, by the spontaneous operations of nature. For they come to be when either the earth or certain parts of [other] plants putrefy; for some of them are not composed separately by themselves but come to be on other trees—for example, mistletoe.}[8]

Plants, however, must be investigated separately by themselves.[9]

3. 724ᵇ26–27.
4. E.g., insects (*GA* 721ª7–9, *HA* 539ª21–26), hard-shelled animals (*HA* 547ᵇ18–32), and eels (*HA* 6.16).
5. Reading ἐστὶ.
6. 732ᵇ11–14, 758ᵇ6–759ª7.
7. *HA* 557ᵇ25–31.
8. This passage should probably be read after 715ª25.
9. The reference is to a lost treatise.

1.2
The Sexes and Sexual Parts

As for the generation of the various animals, we must speak about it in accord with the account that falls to each of them, connecting it to what has just been said. For, as we have said, one may posit as the starting-point of their generation nothing less than the female and the male, the male one as containing the starting-point of the movement and the coming to be, the female one as containing that of the matter. One may be most persuaded of this by getting a theoretical grasp on how the seed comes to be and from where; for though what is composed by nature comes to be from seed, we must not fail to notice how it comes to be from the female and from the male. For it is because a part of this sort is secreted from the female and the male, the secretion being in these and from these, that the female and the male are starting-points of the generation. For by a "male animal" we mean what generates in another, by a "female" what does so within itself. That is why even in the case of the whole universe people consider the nature of the earth as female and mother, but address heaven, the sun, or anything else of this sort as progenitors and fathers.

The male and the female, however, differ with respect to their account, because each is capable of a distinct thing, and with respect to certain of their perceptible parts: with respect to their account, because the male has the capacity to generate in another, as was said previously,[10] while the female has the capacity to generate within itself, that is, it is what the thing that comes to be, which was present in the progenitor, comes to be from. But since they are distinguished by their capacity and by a certain work, and since instruments are needed for all work, and since the parts of the body are the instruments of the capacities, it is necessary for there to be parts for procreation and copulation, and for these to differ from each other, and with respect to which the male will differ from the female. For even if the whole animal is said to be, on the one hand, the female and, on the other, the male, it is not in virtue of it as a whole that it is female or male, but in virtue of a certain capacity and in virtue of a certain part (just as with both seeing and moving by walking), precisely the one that is evident to perception.

In all blooded animals, in fact, such parts in the female are called the "uterus," and in the male "the ones having to do with the testicles and the penis"; for some of them have testicles and other ducts of this sort. But there are differences too between the female and the male in those bloodless ones that among themselves have this contrariety, although in the blooded ones the parts for intercourse differ in their configurations. One must understand, however, that when [even] a small starting-point changes, it is usual for many of the things that follow the starting-point to change along with it. This is clear in the case of castrated animals; for though the generative part alone is destroyed, pretty much the whole shape of the animal changes

10. 716[a]14.

along with it to such an extent that it seems to be female or not far short of it, suggesting that it is not in virtue of some random part or in virtue of some random capacity that the animal is female or male. It is evident, then, that the female and the male appear to be a sort of starting-point. At any rate, when an animal changes in that wherein it is female or male, many things change along with it, suggesting that a starting-point is undergoing a change.

1.3
Testicles and Uterus in Different Animals

As regards the testicles and the uterus—and in the first place as regards the testicles in the males—they are not the same way in all the blooded animals; for some animals of this sort do not have testicles at all (for example, the fish kind and the snake kind), but only two spermatic ducts. Others do have testicles, but have them inside, near the loin, by the region of the kidneys, and from each of them a duct runs (as in the animals that have no testicles), and these join together into one (again like those others)—for example, among animals breathing air and having a lung, all the birds and the egg-laying four-footed animals. For all these too have their testicles inside, near the loin, with two ducts leading from them in a similar way to the snakes—for example, the lizards, the turtles, and all the hard-scaled animals. But all the live-bearing ones have their testicles in the front, though some of them (for example, the dolphin) have them inside, at the end of the abdomen, and have no ducts but rather a sex organ reaching from them to the outside (for example, the ox fish[11]). Others have the testicles outside, either detached (like the human being) or near the fundament (like the pigs). More exact determinations about these have been made in the *History of Animals*.[12]

Every uterus[13] is bipartite, just as the testicles in all males are two. Some animals have it near the sexual parts (as do women, all animals that are live-bearing not only externally but also internally, and all fishes laying eggs that are visible to the eye), others near the diaphragm (as all the birds and live-bearing fishes). The soft-shelled and soft-bodied animals also have a bifurcated uterus. For the[14] membranes encompassing their so-called eggs are uterus-like.

The uterus is most indistinct in the octopuses,[15] so that it appears to be unipartite. The cause of this is that the mass of the octopus's body is similar at every point. It is bifurcated too in the larger insects, while in the smaller ones it is invisible due to the smallness of the body.

This, then, is the way the parts that were mentioned are in the animals.

11. A cartilaginous fish, one of the selachians. *HA* 540ᵇ17, 566ᵇ4.
12. Especially 3.1.
13. This includes the oviducts.
14. Reading τὰ γὰρ.
15. 758ᵃ6–10.

1.4
Differences in the Spermatic Instruments in Males (1)

With regard to the difference in the spermatic instruments in males, if we are going to get a theoretical grasp on the causes it is due to, it is necessary first to grasp what the testicles are composed for the sake of. If nature makes everything either because of what is necessary or because of what is better, this part too should exist because of one of these two things. That it is not necessary for generation is evident; for then every progenitor would have it. But as things stand neither the snakes nor the fishes have testicles; for they have been seen copulating and with their ducts full of seminal fluid. It remains, then, for it to be for the sake of what is better.

The work of most animals is pretty much nothing other than that of plants, namely, [to generate] seed and fruit. But just as in the case of nourishment, where animals with straight intestines are greedier in their appetite for nourishment,[16] so the ones that have no testicles but only ducts, or that do have them but have them internally, are all quicker in the activity of copulation. But those that need to be more temperate, as in the one case they have non-straight intestines, so in the other case they have helices in their ducts, to prevent their appetite from being quick or greedy.[17] It is for this that the testicles have been contrived; for they make the movement of the spermatic residue more still: in the live-bearing ones (for example, in the horses and others of this sort and also in the human beings), they do this by preserving the doubling-back [of the ducts] (one must observe the way they do this with the help of the *History of Animals*[18]). For the testicles are no part of the ducts, but attached to them, just like the stone weights that women attach to their looms when weaving—for if these are removed, the ducts are drawn up internally, so that castrated animals are incapable of generating, since if the ducts were not drawn up, they would be capable of it. In fact, a bull immediately after castration has been known to mate with and impregnate a cow because the ducts had not yet been drawn up.

In the birds and the egg-laying four-footed animals the testicles receive the spermatic residue, so that its emission is slower than in the fishes. This is evident in the case of the birds; for their testicles are much larger around mating time.[19] And those birds that mate at one season of the year have such small ones when this time has passed that they are pretty much indiscernible, but around mating time they are very large.

The ones having the testicles internally mate more quickly; for in fact those having them externally do not emit seed before the testicles are drawn up.

16. *PA* $675^{a}18–24$.
17. *PA* $675^{b}23–28$.
18. $510^{a}12–^{b}4$. The ducts are the epididymis and the vasa deferentia.
19. *HA* $509^{b}35–510^{a}7$.

1.5
Differences in the Spermatic Instruments in Males (2)

Further, the four-footed animals have the instrument for copulation; for it is possible for them to have it, but for the birds and the footless animals it is not possible, because the former have their legs under the middle of their abdomen, and the latter have no legs at all, and it is the nature of the sex organ to hang there and the position for it is to lie there. (That is also why in sexual intercourse there is tension of the legs; for the sex organ is sinewy and the nature of the legs is sinewy too.) So, since it is not possible for them to have this instrument, it is necessary either for them also to have no testicles, or else not to have them there; for in those animals that have [both penis and testicles], the position of both is the same.

Further, in those animals, at any rate, that have external testicles, it is because of the movement of the heated-up sex organ that the seed is gathered together before emission: it is not ready immediately on making contact, as with the fishes.

All the live-bearing animals have their testicles in front, either inside or outside, except the hedgehog. This one alone has them near the loin. This is due to the very same cause as it is also due to in the birds. For it is necessary for their copulation to take place quickly; for unlike the other four-footed animals, they do not mount on the back, but have intercourse standing upright because of their spines.

The cause due to which animals that have testicles have them has now been stated, as has the cause due to which some have them outside, others inside.

1.6
Differences in the Spermatic Instruments in Males (3)

The ones that do not have testicles do not have this part, as was said, not because not having it is good but only because it is necessary, and because it is necessary for their mating to take place quickly. The nature of the fishes is of this sort, as is that of the snakes; for the fishes mate by placing themselves side to side and quickly ejaculating. For just as in the case of the human beings and in all the others of this sort it is necessary to hold in the breath before emitting the semen, so fishes at such times must not take in seawater, and they easily pass away if they do not do this. Therefore, they must not concoct their seed during copulation, as the live-bearing terrestrial animals do, but instead have their seed concocted and gathered together at the proper time, so that they do not concoct it while making contact with each other but emit it already concocted. That is why they have no testicles, but rather straight and simple ducts, like the small part around the testicles that four-footed animals have; for of the part of the duct that is doubled back one part is blooded and another bloodless,[20] and

20. The latter is the vas deferens, the former the epididymis.

this latter part receives the liquid that, when already seed, travels through it, so that when the seed has arrived there, ejaculation takes place quickly in these animals too. In fishes the whole of the duct is like this latter part of it in the case of the human beings and other animals of this sort, that is, the other [straight, bloodless] part of what is doubled back.

1.7
Differences in the Spermatic Instruments in Males (4)

The snakes mate by twining around each other, but do not have testicles or even a sex organ, as was said previously[21] (no sex organ, because they have no legs either; no testicles because of their length), but rather ducts just as the fishes do; for because their nature is to be so long, if there were further delay having to do with testicles, the semen would get cooled down because of its slow progress. This is precisely what happens in the case of those with large sex organs; for they are less fertile than those who have more moderately sized ones because cold seed is not fertile, and it gets cooled down by traveling too great a distance. Due to which cause some animals have testicles while others do not have them has now been stated.

The snakes intertwine with each other because they are not naturally suited for placing themselves side to side. For being so long, and the part by which they attach themselves being so small, they are not easily fitted together. Since, then, they have no parts with which to embrace, instead of this they make use of the suppleness of their bodies, twining around each other. Because of this too they seem to be slower to ejaculate than fish, not only because of the length of the ducts, but also because of the care taken about these proceedings.

1.8
The Uterus; Live-Bearing and Egg-Laying Animals; Complete and Incomplete Eggs

In the case of females, one might raise a puzzle about the way the uterus is; for many contrarieties are found in this. For not even all the live-bearing ones have it in a similar way, but rather the human beings and all the terrestrial animals have the uterus low down near the sexual parts, while the live-bearing selachians[22] have it higher up near the diaphragm; nor do the egg-laying ones, but rather the fishes **718^{b}1** have it low down just like the human being and the live-bearing four-footed animals,

21. 717^{a}18 mentions only a lack of testicles.
22. *HA* 6.10–11.

while the birds have it higher up as do the egg-laying four-footed animals. Yet even these contrarieties are in accord with reason.

For first of all the egg-laying ones have different ways of laying their eggs; for some eggs are incomplete when emitted—for example, those of the fishes; for the eggs of the fishes are completed and do their growing outside. The cause is that the fishes are prolific; in fact, this is their work, just as it is of plants. If, then, the fishes were to complete their eggs inside themselves, it would be necessary for these to be few in number. But as things stand, they have so many that each uterus seems to be [all] egg, at any rate, in the small fishes; for these are the most prolific of all, just as in the case of other things—both among the plants and among the animals—that have a nature analogous to theirs; for growth in size turns in them to seed.[23]

The birds, however, and four-footed egg-laying animals lay eggs that are complete, which must, for preservation, be hard-skinned (for they are soft-skinned until they have grown). But their shell comes about due to heat, which evaporates the liquid from the earthen material. It is necessary, then, for the place where this will happen to be hot. And the one around the diaphragm is like this; for it in fact concocts the nourishment. If, then, it is necessary for the eggs to be within the uterus, it is also necessary for the uterus to be near the diaphragm in those animals that lay eggs that are complete, but to be low down in those that lay incomplete ones. This way it will be advantageous. Also, it is more natural for the uterus to be low down rather than high up, whenever there is not some other work of nature to prevent it; for the limit of the uterus[24] is low down too; where the limit is, there the work is too, and the uterus is where its work is.

1.9
Internally and Externally Live-Bearing Animals

The live-bearing animals too exhibit difference in relation to each other. For some live-bear, not only externally but also internally[25]—for example, the human beings, the horses, the dogs, and all those having hair, and among aquatic animals, the dolphins, the whales, and the soft-bodied animals of this sort.

23. Because both blood and seed are residues from nourishment, which is what produces growth (726[b]1–11).

24. Probably, the opening from which the eggs emerge.

25. I.e., without first producing an egg. The microscopic mammalian egg was unknown to Aristotle.

1.10
Internally Egg-Laying and Externally Live-Bearing Animals

The selachians and the vipers, though they live-bear externally, first lay eggs internally. And the egg they lay is a complete one; for this is the way an animal is generated from the egg, while from incomplete ones nothing is generated. They do not lay eggs externally because they are cold in their nature, and not, as some people say,[26] hot.

1.11
More on the Uterus and Its Placement

At any rate, the eggs the [selachians and vipers] generate are soft-skinned; for, because they have so little heat, their nature does not dry the extremity [of the egg]. It is because of their being cold, then, that they generate soft-skinned ones, and because they are soft-skinned they do not do so externally; for they would have been destroyed. **719^{a}1**

When the animal comes to be from an egg, the way it comes to be is mostly just the same as the one in which the birds come to be, that is, [the egg] descends and the animal comes to be near the sexual parts, just as in those animals too that are live-bearing from the outset. That is also why in animals of the sort we are discussing the uterus is dissimilar to that of both the live-bearing and the egg-laying animals, because they participate in both forms; for in all the selachians it is at once near the diaphragm and stretching along downward. (But one must observe the way this and the other sort of uterus are with the help of the *Dissections* and the *History of Animals*.[27]) So, because they are egg-laying and lay complete eggs, the selachians have their uterus high up, but because they are live-bearing, they [also] have it low down, participating in both.

Animals that are live-bearing from the outset all have the uterus low down; for this impedes no work of nature nor do they double-bear.[28] In addition, it is impossible for an animal to come to be near the diaphragm; for fetuses necessarily possess heaviness and movement, and that place, because it is vital for life, would not be capable of enduring these things. Further, delivery would necessarily be difficult because of the length to be traveled, since, even as things stand, in the case of women, if they draw up the uterus around the time of giving birth, by yawning or doing something of this sort, they have a difficult delivery. But even when empty the uterus produces a stifling sensation if moved upward. And in fact it is necessary, if it is going to contain an animal, for the uterus to be stronger [than in egg-laying animals], which is why it is fleshy in all the live-bearing ones, while those that are near the diaphragm are

26. E.g., Empedocles (*Juv.* $477^{a}32$–$^{b}5$).
27. $510^{b}5$–$511^{a}34$.
28. I.e., they are not both egg-laying and live-bearing.

membranous. And in the case of those that double-bear it is evident that this is so; for they hold their eggs high up and on the side, but hold the living young in the lower part of the uterus.

What the cause is due to which the uterus is present in contrary ways in some animals, and, in general, why in some it is low down, in others high up near the diaphragm, has now been stated.

1.12
Placement of Uterus and Testicles

Why do all animals have the uterus inside, while some have their testicles inside, others outside? The cause of the uterus being inside in all animals is that what is coming to be is in this, and it needs safeguarding, shelter, and concoction, while the place outside the body is easily harmed and cold. The testicles are outside in some animals, inside in others. But because[29] they also need shelter and a covering to preserve them, and for the concoction of the seed (for when chilled and stiffened, it is impossible for them to be drawn up and emit semen), those animals that have their testicles visible have a shelter of skin over them called the "scrotum." Those, on the other hand, the nature of whose skin opposes this arrangement, because it is very hard and is neither capable of enclosing them nor of being softened and is like [true] skin,[30] necessarily have them inside—for example, those that have fish-like skin or are hard-scaled. That is why the dolphins and those cetaceans that have testicles have them inside, as do the hard-scaled animals that are egg-laying and four-footed. And the skin of the birds is also hard, so that it will not conform to the magnitude of anything and enclose it—in fact, this is a cause in all these cases [of their having their testicles inside] that is in addition to the others stated previously, stemming from facts about the necessities of mating. Due to the same cause the elephant and the hedgehog also have their testicles inside; for in their case too the skin is not naturally well-disposed to keeping the sheltering part separate.

{Contrary positions for the uterus are also found in those animals that are live-bearing internally and in those that are externally egg-laying, and in the latter again some have it low down, others near the diaphragm—for example, the fishes in comparison to the birds and the egg-laying four-footed animals. And [it is different again] in those that generate in both ways, being egg-laying internally and live-bearing externally. For those that are live-bearing both internally and externally have their uterus placed on the abdomen—for example, the human being, the cow, the dog, and the others of this sort. For it is advantageous for the protection and the growth of the fetus that no weight be put on the uterus.}[31]

29. Reading διὰ δὲ and secluding διόπερ at 719b4.
30. Reading καὶ δερματικήν.
31. Perhaps to be secluded as an inaccurate recollection of the preceding chapters.

1.13
Excretory and Spermatic Ducts in Females and Males

The duct through which the dry residue and that through which the liquid one issues are also distinct in all these animals. That is why all animals of this sort, both male and female, have sex organs by which the liquid residue is excreted, and in males the seed, and in females the embryo. This duct is above and in front of the duct for [the excretion] of the dry nourishment. {All animals that are egg-laying animals but lay incomplete eggs—for example, the egg-laying fishes—have their uterus not under the abdomen but near the loin; for the growth of the egg does not impede this, because what is grown is completed and develops outside.}[32] The duct is the same as that for the solid nourishment[33] in those animals that have no generative sex organ, all the egg-laying ones, even in those of them that have a bladder—for example, the turtles; for it is for the sake of generation, not for the excretion of liquid residue, that the ducts are twofold. And because the nature of seed is liquid, the residue of the liquid nourishment also shares the same duct. This is clear from the fact that though all animals bear seed, liquid residue does not occur in all of them.

Since, then, the spermatic ducts in males must be fixed in position and not wander about, as must the uterus in females, and it is necessary for this fixing to take place at either the front or the back of the body, in live-bearing animals, because of the fetuses, the uterus is in the front, in egg-laying ones it is at the back near the loin, and those that are internally egg-laying but externally live-bearing have them both ways, because they participate in both, being both live-bearing and egg-laying; for the upper part of the uterus, where the eggs come to be, is under the diaphragm near the loin and the back, but its continuation[34] is low down near the abdomen; for it is in this part that it is actually live-bearing. And there is one duct in these animals for the dry residue and for mating; for none of them, as was said previously,[35] has a detached sex organ.

The ducts of males, whether they have or do not have testicles, are similar to the uterus of the egg-laying animals; for in all of them they are attached near the back over against the place of the spinal column; for they must not wander about, but rather be fixed in position, and the place at the back is of this sort; for it provides continuity and stability.

In those that have their testicles inside, indeed, they are fixed in position from the outset, and similarly in those that have them outside. Then they meet and unite near the place of the sex organ.

32. This sentence clearly belongs with the other bracketed material at the end of 1.12.
33. Secluding καὶ.
34. Reading προϊοῦσα.
35. $716^{b}13$–32, *HA* $509^{a}35$–$^{b}3$.

The ducts are also similar in the dolphins, although they have their testicles hidden under the abdominal cavity.

How the animals have the parts positioned that have to do with contributing to **720[b]1** generation, and due to what causes, have now been stated.

1.14
Soft-Shelled Animal Copulation

In the case of the other animals, the bloodless ones, the way they have the parts contributing to generation is neither the same as among the blooded ones nor among themselves. We have four kinds remaining: first, the soft-shelled animals; second, the soft-bodied animals; third, the insects; and fourth, the hard-shelled animals (but though it is not clear about all of them, it is evident that most of them do not copulate; in what way they get composed must be stated later[36]).

The soft-shelled animals copulate like the animals that urinate backward, when, with one supine and the other prone, they fit their tails together; for their tails, because they have long flaps attached to them, prevent them from mounting with underneath parts to back parts. The males have thin spermatic ducts, while the females have a membranous uterus alongside the intestine, divided on either side, in which the egg is generated.

1.15
Soft-Bodied Animal Copulation

The soft-bodied animals intertwine at the mouth, pushing against each other and twining together their tentacles. This way of twining together is of necessity; for nature has turned around the end of the duct for residues and brought it near the mouth, as was said previously.[37] The female in each of these animals, it is evident, has a uterus-like part; for it contains an egg which at first is indistinct, but then becomes disaggregated into many, each of which is incomplete when it is laid, as with the egg-laying fishes. And the same duct is for the residues and for the uterus-like part both in the soft-shelled animals and in these. For it is through this duct that the animal emits its ink, and it[38] is on the underneath parts of the body where the mantle is open and the seawater enters in.

That is why the copulation of the male with the female takes place at it; for if indeed the male emits something, whether seed or a part,[39] or some other capacity,

36. 3.11.
37. *PA* 684[b]35–685[a]3.
38. Reading ἔστι γὰρ ᾗ τὸν θολὸν ἀφίησι διὰ τοῦ πόρου, τοῦτο δ᾽ἐστὶν.
39. Perhaps the so-called hectocotylized tentacle.

it is necessary for him to have sex with her at the uterus-like duct. But in the case of the octopuses, the insertion of the tentacle of the male through the funnel of the female, by which tentacle the fishermen say he mates, is for the sake of their twining together, not as an instrument useful for generation; for it is outside the duct [of the male], indeed outside his body.

Sometimes too the soft-bodied animals copulate front down, but whether for the sake of generation or due to some other cause has not been observed yet. **721^{a}1**

1.16
Insect Copulation; "Spontaneous Generation"

Among the insects, some copulate, and the generation of them is from synonymous[40] animals (just as in the case of the blooded animals)—for example, the locusts, the cicadas, the spiders, the wasps, and the ants. Others, although they copulate and generate, do not generate things of the same kind as themselves but larvae only, nor do these come to be from animals, but rather from putrefying liquids, and some from putrefying dry materials—for example, the fleas, the flies, and the cantharides. Others again neither come to be from animals nor do they copulate, like the gnats, the mosquitoes, and many such kinds.[41]

In most of the sorts that copulate, the females are larger than the males; and the males do not appear to have any spermatic ducts. And the male, speaking of what holds in the majority of cases, does not insert any part into the female, but rather the female does so upward from below into the male. This has been observed in many cases, the contrary in few. But we have not yet been able to see how to divide them by kind.

And this is so too in the case of pretty much the majority of the egg-laying fishes, also in the case of the four-footed animals that are egg-laying; in fact, the females are larger than the males because of its being advantageous to them due to the mass of eggs generated during pregnancy. And in the females of these the part analogous to the uterus is divided and alongside the intestine, as in the other animals, and the embryos come to be in it. This is clear [only] in the case of the locusts and whatever, having the size of these, naturally copulates; for most insects are too small [for this to be clear].

These, then, are the ways the generative instruments in animals, which were not spoken about previously,[42] are. Of the uniform parts left aside there, semen and milk, about these it is now the opportune time to speak—about semen immediately, about milk in what follows.[43]

40. *Cat.* $1^{a}6$–12.
41. It is not certain which insects are meant.
42. In *PA*.
43. 4.8.

1.17
Do All Animals Emit Seed? Pangenesis

It is evident that some animals emit seed—for example, those whose nature is to be blooded. But whether the insects and the soft-bodied animals do so or not is unclear. So this is something we must get a theoretical grasp on, whether all male animals emit seed, or not all of them do, and if not all of them do, what the cause is due to which some do while others do not. Also, whether the females too contribute any seed or not, and if not seed, whether nothing else at all, or though they do contribute something, it is not seed. Further, we must also investigate what the ones that do emit seed contribute to generation by means of their seed, and, in general, what the nature of seed and of so-called menses is, in the case of those animals that emit these liquids.

It seems that all come to be from seed, and the seed from the progenitors. That is why it belongs to the same account to ask whether both female and male emit it or only one of the two, and whether it comes from all the body or not from all; for it is reasonable to suppose that if it does not come from all of it, neither does it come from both progenitors. That is why, since some people say that it comes from all the body,[44] we must investigate how things stand on this question first.

There are pretty much four things that someone might use as proofs. First, the intensity of the pleasure involved; for a feeling is more pleasant when it is more intense, and what happens to all the parts is more intense than what happens to one or a few. Further, that from docked[45] things docked things come to be; for because a part is missing [from the progenitor], no seed, they say, proceeds from there, with the result that the part from which no sperm comes does not come to be. In addition to these, the similarities to the progenitors; for the young look like them not only as regards the body as a whole but also part for part. If indeed, then, the cause of the similarity of the whole is the seed coming from the whole, the cause of the similarity of the parts should be its also coming from each of the parts as well. Further, it would seem reasonable to suppose that just as there is also some primary thing[46] from which the whole comes to be, it is this way too with each of the parts. So if there is a seed for the whole, there should also be a special seed for each of the parts.

And things of this sort are taken as persuasive evidence for these beliefs; for children are born who are like their parents not only in innate characteristics but also in acquired ones; for when the progenitors have had scars, certain of the offspring have been known to have the imprint of the scar in the same places, and there was a case in Chalcedon where the father had a brand on his arm and the letter was marked on the child, though blurred, to be sure, and not clearly articulated.

44. This view is usually referred to as "pangenesis."
45. *Met.* 5.27.
46. I.e., some primary matter. See 729a32–33, 733b26.

It is pretty much on the basis of these considerations above all, then, that some people are persuaded that the seed comes from all [of the body]. **722^{a}1**

1.18
Pangenesis Criticized; What Seed Is; Residues and Colliquescences

On examining the argument, however, the contrary appears more [persuasive]; for to refute the things just stated is not difficult, and in addition the argument involves saying other impossible things. First of all, then, similarity is no sign that the seed comes from all the body, because similarities occur in the voice, the nails, the hair, and even in movement, from which nothing comes. And there are some things that people do not yet have when they generate—for example, a beard or gray hair. Further, children are like their distant ancestors from whom nothing has come; for these likenesses recur after many generations—for example, the woman in Elis who had intercourse with an Ethiopian;[47] for it was not her daughter but her daughter's son who became Ethiopian. And the same argument applies to plants; for it is clear that in their case as well the seed would have to come from all the parts. But many parts are in some cases not possessed, in others may be removed, and in others still they grow on afterward. Further, the seed does not come from the seedcase either, and yet this too is generated having the same shape [as in the parent plant].

Further, does the seed come only from each uniform part (for example, from the flesh, the bone, and the sinew) or also from the non-uniform ones (for example, the face and the hand)? For if only from the former, [we object that] they are like their parents more in the latter (the non-uniform ones, such as the face, the hands, and the feet[48]). If indeed, then, not even similarity in the non-uniforms parts is due to the seed's coming from all the parts, what prevents similarity in the uniform ones from being due not to its coming from all of them either, but to some other cause? And if the seed comes only from the non-uniform parts, it therefore does not come from all the parts. And it is more fitting for it to come from the uniform ones because they are prior and the non-uniform ones are composed of them, and just as likenesses occur in the face and the hands, so they do too in the flesh and the nails. If, however, it comes from both, what would be the mode of generation? For the non-uniform parts are composed from the uniform ones, so that to come from the former would be to come from the latter and from their composition. It is just like if something came from a written name: if it came from all of it, it came from each of the syllables, and, if it came from these, it came from the letters and from their composition. So, if indeed the flesh and the bone are composed of fire and things of that sort, the seed would come rather from the elements; for how could it possibly come from their

47. The woman was white, the man black; their daughter was white, her son black.
48. Retaining τὰ ἀνομοιομερῆ οἷον πρόσωπον καὶ χεῖρας καὶ πόδας.

composition? Without composition, however, there would not be the similarity. If
722ᵇ1 something posterior crafts this, it would be the cause of the similarity, not the seed's coming from all the parts.

Further, if the parts are torn asunder in the seed, how are they alive? On the other hand, if they are connected, they would be a tiny animal.

And what about what belongs to the sex organs? For what comes from the male and what comes from the female are not similar.

Further, if the seed comes from all parts of both progenitors alike, two animals come to be; for it will have every part of each parent. That is why, if indeed one must speak in this way, Empedocles seems to speak most in agreement with this account; for he says that there is a sort of token in the male and in the female, and that the whole offspring comes from neither one, "torn asunder is the nature of the limbs, this part in man's . . .";[49] for otherwise why do the females not generate from themselves, if indeed the seed comes from all the parts and they have a receptacle? But, as it seems, either it does not come from all the body or it does so in the way Empedocles says, not the same thing from each parent—which is why in fact they need to have sexual intercourse with each other. Yet even this is impossible—as impossible, in fact, as it is for the full-grown parts, when torn asunder, to survive and be animate, which is how Empedocles speaks of them as coming to be under the influence of love, "as many heads sprouted without necks"[50]—and later, in this form, growing together. But it is evident that this is impossible; for neither having a soul nor being alive, they would be incapable of surviving—nor, if they were like living animals could several of them grow together so as to be one again. Yet saying that it is this way follows from saying that seed comes from all the body, and just as it was then in the case of the earth under the influence of love, so, on this view, it is in the case of the body. For it is impossible for the parts to come to be [already] connected, that is, come from [the bodies of progenitors] and go off together into one place. Next, how were the upper and lower parts, right and left ones, and front and back ones torn asunder? For all these things are unreasonable.

Further, some parts are distinguished by capacity, others by affections: the non-uniform ones (for example, the tongue and the hand) by their capacity to do something, the uniform ones by hardness and softness and other affections of this sort. It is not in any and every state, then, that a part is blood or flesh. It is clear, therefore, that what has come from them cannot be synonymous with the parts—for example, blood from blood or flesh from flesh. But then if it is from something
723ª1 else that blood comes to be, the cause of the similarity would not be—as those who speak this way say—the coming of seed from all the parts; for it is enough that it come from one part, if indeed it is not from blood that blood comes to be. For why could not all come to be from one? For their account seems to be the same as that of

49. B63 DK.
50. B57 DK.

Anaxagoras, in having none of the uniform things come to be—except that he makes it apply to all things, these thinkers to the generation of animals.

Next, in what sort of way will these parts—the ones that come from all the body—grow? For Anaxagoras reasonably says that [particles of] flesh from the nourishment are added to [particles of] flesh. But if they do not say this, yet say that [seed] comes from all, how, by the addition of something else, will something get bigger, if what is added is not changed? But then if it is admitted that what is added is capable of changing, why not say that from the outset the seed is such that blood and flesh can come to be from it, instead of saying that it itself is blood and flesh? For it certainly is not open to them to say that later growth is due to mixing, like wine when water is poured into it; for each part would have been most of all itself when still unmixed. But as things stand it is rather later on that it is flesh, bone, and each of the other parts. And to say that the some of the seed is sinew and bone is beyond us, as the saying goes.

In addition, if female and male differ during pregnancy, as Empedocles says, seeds "were poured into pure places; some became women when they encountered cold,"[51] then it is evident that just as both women and men change from infertile to fertile, so they also change from female-bearing to male-bearing, which suggests that it is not in the coming from all or not from all that the cause lies, but in the proportion or disproportion between what comes from the woman and what comes from the man, or else it is due to some other cause of this sort. It is clear, therefore, if we assume it to be this way, that[52] the female is not due to the seed's coming from a certain thing, with the result that neither is the part special to the male nor the one special to the female—if indeed the same seed is capable of becoming either female or male, implying that the part is not present in the seed. What difference is there, then, between saying this about this part and saying it about any of the others? For if seed does not come to be even from the uterus, the same argument will apply to the other parts as well.

Further, certain animals come to be neither from those of the same kind nor from those of a different kind—for example, the flies and the kinds called "fleas." And though animals come to be from these, they are no longer ones of a similar nature, but a kind of larvae. It is clear, then, that offspring of a distinct kind do not come to be from every part; for they would be similar to [the progenitors] if indeed similarity were a sign of coming from every part.

Further, from one act of sexual intercourse even some of the animals generate several offspring (and the plants in fact do so always; for it is clear that from one movement these bear all their yearly fruit). And yet how is this possible if the seed were secreted from all the body? For then it is necessary for one secretion to come to be from one act of sexual intercourse and one disaggregation [of seed]. It is not

51. B65 DK.
52. Reading οὕτως, ὅτι.

possible for it to get separated up in the uterus; for by then the separation would be, as it were, from an animal, not from seed.

Further, plant cuttings bear seed from themselves. It is clear, then, that even before they were cut, they bore the fruit from their own magnitude, and not from seed coming from all of the plant.

But a greater proof than these is one we have adequately observed in the case of the insects. For if not in fact in all, yet in most cases, during mating the female extends a part of itself into the male. (That is why in fact they mate, as we said previously,[53] the way they do; for it is evident that the ones below insert something into the ones above, not in all cases, but in most of those observed.) So it is evident, even in those males that emit semen, that the seed's coming from all the body is not the cause of generation, but it occurs in some other way that must be investigated later on.[54] For even if it did indeed happen to come from all the body, as they say, still they should not claim that it comes from everything, but only from what does the crafting—from the carpenter, as it were, but not from the matter. But as things stand, they speak as if it even came from shoes; for it is pretty much the case that a son who is similar to his father wears shoes that are similar to his.

The cause of pleasure's being very intense during sexual intercourse is not that the seed comes from all the body but that there is a strong titillation. That is why if this intercourse happens often, the enjoyment is less for those having sex. Further, the **724ᵃ1** enjoyment is at the end, but [on the view under discussion] it should be in each of the parts, and not at the same time, but earlier in some and later in others.

Docked offspring are come to be from docked progenitors due to the same cause as that due to which they are similar to them. But offspring that are not docked also come to be from docked ones, just as some are not similar to their procreators. We must get a theoretical grasp on the cause of these things later on;[55] for the problem here and there is the same.

Further, if the female does not emit seed, by the same argument the seed does not come from all the body either. And if it does not come from all, there would be nothing unreasonable in its not coming from the female, but for the female to be in some other way a cause of generation. This is the next thing to be investigated, since it is now evident that the seed is not secreted from all the parts.

As starting-point both of this investigation, however, and of the ones that follow, the first thing to grasp about the seed is what it is; for in this way it will be easier to get a better theoretical grasp both on its works and the facts concerning it.

"Seed" means the sort of thing whose nature is to be the first from which what is composed in accord with nature comes to be, not from that thing which is the

53. 721ᵃ9–17.
54. 1.21.
55. 4.3.

progenitor—for example, the human being; for it comes to be from it because the seed belongs to it.[56] But there are many ways in which one thing comes to be from another—for there is a distinct way in which we say night comes to be from day and man from boy, because this one comes after this one. Another is as a statue comes to be from bronze, a bed from wood, and whichever other things come to be as things are said to come to be from matter—from something preexisting having been given a certain configuration the whole thing exists. Another way is as non-musical comes to be from musical, sick from healthy, and, in general, contrary from contrary. Further, beyond these, there is the way Epicharmus produces his climax: from slander abuse, from abuse a fight. In all these cases, the "from something" is the starting-point of movement. And in some cases of this sort the starting-point of movement is within the things themselves as in the case mentioned (for the slander is a part of the entire disturbance), while in some it is external—for example, the crafts [as the starting-points of movement] are outside the things crafted and the torch outside the burning house.

It is evident, however, that the seed is one or other of two ways; for it is either from it as its matter, or from it as the primary mover,[57] that what comes to be has come to be. For it certainly does not do so as this comes after this (for example, from the Panathenaean festival comes the sea voyage[58]), nor as contrary does from contrary; for it is from the passing away of its contrary that the contrary comes to be, and there must be some other subject underlying and remaining present from which it will first come to be. Of the two, then, it is necessary to grasp in which the seed must be put, whether as matter and affected, as form of a sort and affecter, or indeed as both. For at the same time it will perhaps also be clear how generation from contraries belongs to everything that comes to be from seed; for generation from contraries is natural too; for some things come to be from contraries, from male and female, others from one thing only—for example, the plants and certain of the animals in which the male and the female are not distinct and separate.

{What comes away from the progenitor in whatever naturally copulates is called "semen," the first thing containing a starting-point of generation, while seed is what contains the starting-points from both copulators (like the seeds of plants and of certain animals in which male and female are not separated), as the first mixture that comes from female and male, being, as it were, a sort of embryo or an egg; for in fact

56. Reading τούτου.

57. I.e., the proximate mover—the first mover one encounters in proceeding from what is moved.

58. Legend had it that Athens was once obliged to send King Minos of Crete an annual tribute of seven young men and seven maidens to be given to the Minotaur—a monster, half man and half bull, that he kept in a labyrinth. With the help of a thread given to him by Minos' daughter Ariadne, Theseus, a legendary king of Athens, made his way through the labyrinth, killed the Minotaur, and escaped, thus ending the tribute. Each year, Athens commemorated these events by sending a mission of thanks to the sanctuary of Apollo on the sacred island of Delos. This is the sea voyage referred to.

these already contain what comes from both progenitors. Seed and fruit differ by the prior and the posterior; for fruit [is posterior] in that it is from another thing, seed [is prior] in that another comes from it, since both are in fact the same thing. But it must be stated again what the primary nature is of what is called "seed."}[59]

It is necessary for everything that we find in the body to be either a part in accord with nature (and it either non-uniform or uniform) or contrary to nature, like a tumor, a residue, a colliquescence, or nourishment. (By a "residue" I mean a leftover of the nourishment, by a "colliquescence," what has been secreted from a growth-producer by a contrary-to-nature dissolution.)

That it could not be a part is evident; for although it is uniform, nothing is composed of it as of sinew and flesh. Further, neither is it separated, though all the other parts are. But then it is not one of the contrary-to-nature ones either, nor a deformation; for it is present in all and the nature comes to be from it. Nourishment, on the other hand, is manifestly something brought in from outside. So it is necessary for seed to be either a colliquescence or a residue.

The ancients seem to have thought it to be a colliquescence; for saying that it comes from all the body because of the heat from the movement [in copulation] has the force of saying it is a colliquescence. But colliquescences are something contrary to nature, and from things contrary to nature nothing comes to be that is in accord with nature. It is necessary, therefore, for it to be a residue. But now every residue is surely either from useless or from useful nourishment. I call "useless" that from which nothing further is contributed to the nature, while much injury is done by using up too much of it, and "useful," the contrary. That seed could not be the former sort of residue is evident; for those in the worst condition because of time of life or disease have the most of this sort of residue present in them, but the least seed; for either they have none at all or it is not fertile because of being mixed with useless and morbid residue.

The seed, then, is some part of the useful residue. The most useful is the last residue, that is, the one from which each of the parts comes to be from the outset. For there is some residue that is earlier, some later. The one from the first stage of the nourishment is phlegm and anything else of that sort; for even phlegm is a residue of the useful nourishment, a sign of which is that when mixed with pure nourishment it is nourishing and is used up in cases of disease. But the last residue from a large quantity of nourishment is extremely small. One must understand, however, that animals and plants grow day by day [only] a little; for if [even] a very small quantity of the same material were added, the thing's size would become excessive.

We must, therefore, say the contrary of what the ancients said. For they said that the seed is what comes from all the body, but we say that it is what naturally goes to all of it, and while they thought it a colliquescence, it is evident that it is a residue instead. For it is more reasonable for the last thing going there to be similar to what is

59. The status and position of this passage are uncertain.

left over from it, as painters often have flesh-colored pigment left over that is similar to what they used up. But everything that undergoes colliquescence is destroyed and departs from its nature.

A proof that seed is not a colliquescence, but rather a residue, is that large animals have few young, while small ones are prolific. For it is necessary for there to be more colliquescence in large animals, but less residue; for since the body is large most of the nourishment is used up for it so that little residue occurs.

Further, no place is assigned to a colliquescence in accord with nature; rather, it flows wherever there is an easy route in the body, while to all the residues a place in accord with nature is assigned—for example, that of the dry nourishment is the lower stomach, that of the liquid nourishment is the bladder, that of the useful one is the upper stomach, and of the spermatic residues the places are the uterus, the sex organs, and the breasts; for it is into these that it is gathered and flows together.

The things resulting from it are also evidence that seed is what we have said it is. These result because the nature of the residue is the sort it is. The exhaustion that occurs from the smallest departure of seed is noticeable, suggesting that bodies are being deprived of the final thing to come from the nourishment. (A few individuals, it is true, for a short time, in accord with the time of life, obtain relief through its departure when it is excessive in quantity, just as with the first nourishment if it is excessive in quantity; for on its emission too the body thrives more.) Further, this results when other residues depart with it; for what departs is not seed alone, but rather other capacities that are mixed with it also depart along with it in these cases, and these are morbid ones. That is why in certain cases at least what departs is in fact infertile due to its containing little of what is spermatic. But speaking of most cases and for the most part, the result of acts of sexual intercourse is exhaustion and incapacity [rather than relief], due to the causes just stated.

Further, no seed is present either in the first time of life, in old age, or in illnesses—in sickness because of incapacity, in old age because the nature does not concoct enough of it, in childhood because, due to growing, all is used up beforehand; for in pretty much five years, in the case of the human beings, at any rate, the body seems to gain half of the total size that it comes to have in all the rest of its lifetime.

In many animals and plants, however, a difference results in this regard both between one kind in relation to another kind and, within the same kind, between things of the same form in relation to each other—for example, human being in relation to human being, or vine in relation to vine. For some have abundant seed, some have little seed, and others no seed at all—not because of weakness but, in some cases, at any rate, because of the contrary; for it is all used up on the body, as in the case of some human beings; for being in good condition and becoming very fleshy and rather too fat they emit less seed and have less appetite for sexual intercourse. A similar thing is the affection having to do with "goatish" vines, the ones that because of their nourishment become rampant (since goats also mate less when they are fat, which is why in fact they thin them down before [the mating season], the vines are

called "goatish" after the affection of the goats). And fat people, women as well as men, appear to be less fertile than those who are not fat, because the residue when concocted in well-fed bodies becomes fat; for fat too is a healthy residue caused by abundant feeding.

Some bear no seed at all—for example, the willow and the poplar.[60] This affection too has both sorts of cause.[61] For in fact, due to incapacity, they do not concoct [their nourishment] and, due to capacity, they use it up, as was said.[62] Similarly, both being prolific and having abundant seed are due in some cases to capacity and in others to incapacity. For much useless residue is mixed together with it, so that some even become ill when there is no easy route for its evacuation with this.[63] And though some regain their health, others actually die. For they [the useless residues] get dissolved in it [the seed] as also in the urine; for this is also an ailment that has been known to befall some people.

Further, the duct is the same for the residue and for the seed. And in those in which both the liquid and the dry [residues from] nourishment occur, the duct for the liquid one is the very same as the one for the secretion of the semen (for it is a residue of the liquid; for the nourishment for all things is more wet), but in those that do not have a liquid residue the secretion of the semen is by the way of the dry sediment.[64]

Further, a colliquescence is always morbid, while the subtraction of a residue is beneficial. But the emission of seed plays a double game because it takes with it some of the nourishment that is not useful. If it were a colliquescence, however, it would always cause harm. But as things stand it does not do this.

That the seed, then, is a residue of the useful nourishment, that is, the last stage of the nourishment, whether emitted by all or not, is evident from what was said.

1.19

Semen as a Residue of Nourishment and Blood; Menses as a Residue

After these issues we must determine of what sort of nourishment the seed is a residue, and of what sort the menses; for menses occur in some of the live-bearing animals. For through this means it will also be evident whether the female emits seed like the male and what comes to be is a mixture of two seeds, or whether no seed is secreted from the female; and if no seed, whether she contributes nothing else at all

60. A false view, explaining why the trees are connected with the dead (e.g., Homer, *Odyssey* 10.510).
61. Reading καὶ ἑκάτεραι αἰτίαι.
62. 725ᵇ30.
63. Reading ταύτῃ.
64. The dry residue.

to generation but only provides a place, or does contribute something, and if so how and in what way.

That blood is the last stage of the nourishment in blooded animals, and its analog in bloodless ones, was said previously.[65] And since semen too is a residue of nourishment, that is, from its last stage, it will be either blood, its analog, or something composed of these. And since each of the parts comes to be from blood as it is being concocted and somehow divided into parts, and since the seed (although quite distinct from blood when, having been concocted, it is secreted), when unconcocted and when forced out by too frequent indulgence in sexual intercourse, is sometimes still bloodlike when it has emerged, it is evident that the seed must be a residue of bloodlike nourishment, the one that is finally distributed to the parts. And because of this it has great capacity (and in fact the emission of the pure and healthy blood is cause of exhaustion) and that offspring should be like their parents is reasonable; for what has gone to the parts is like what is left over. So the seed of the hand, the face, or the whole animal is in an undifferentiated way a hand, a face, or a whole animal—that is, as each of the latter is actually, such the seed is potentially, either in virtue of its own mass or in virtue of having a certain capacity within it (for it is not yet clear from these determinations whether the body of the seed is the cause of generation, or whether it contains a certain state and starting-point of movement that is capable of generation); for neither the hand nor any other part at all, without being soul-involving or having a certain other capacity, is a hand or any other part whatever except homonymously.[66]

{It is also evident that in cases where a colliquescence occurs that is spermatic, it too is a residue. This happens when it is resolved into what went before, just as when a fresh coat of plaster falls off immediately (for what comes away is the same as what was first applied). Similarly, the final residue is the same as the first colliquescence.}[67] And let these things be determined in this way.

Since, however, it is necessary for a more abundant and less concocted residue to occur in what is weaker, and [seed] being of this sort, it is necessary for it to be a quantity of bloodlike liquid, and since the weaker is what has a lesser share of heat in accord with nature, and the female is of this sort, as was said previously,[68] it is necessary for the bloody secretion that occurs in the female to be a residue as well. And the so-called menstrual secretion is of this sort.

That menses are a residue, therefore, and that they are the analog in females of semen in males, is evident. The results associated with it are signs that this statement is correct. For at the same time of life semen starts to appear in the males and be secreted and menses to be emitted in the females, and the voice changes and the

65. *PA* 650ᵃ34, 651ᵃ15, 678ᵃ8.
66. E.g., *DA* 412ᵇ20–22.
67. This should be read after 726ᵃ25.
68. *PA* 648ᵃ12.

breasts give signs of appearing. Also, at the time of life's declining the capacity to generate ceases in the one and the menses cease in the other.

Further, there are also the following signs that this secretion in the females is a residue. For, for the most part, neither hemorrhoids, nosebleeds, nor anything else [of the sort] occurs in women unless the menses are ceasing, and if something of this sort does occur, the menstrual purgations become more difficult, suggesting that the secretion is being diverted to it.

Further, the females do have blood vessels that are as large as the males', and are more hairless and smoother, because the residue that goes to these is secreted along with the menses. And this same thing must be considered as the cause of the body masses of the females being smaller than those of the males among the live-bearing animals; for it is only in these that the menses flow out externally. And among these it is most noticeable in women; for woman emits more secretion than other animals. That is why she is always noticeably pale and without conspicuous blood vessels, and has an evident deficiency of body as compared with the males.

Since this is what occurs in the females as semen does in the males, and since it is not possible for two spermatic secretions to occur at once, it is evident that the female does not contribute seed[69] to generation. For if there were seed, there would be no menses. But as things stand, because the menses occur, there is no seed.

Why, then, just as the seed is a residue so too are the menses has now been stated. As evidence of this one may take what some of the resulting facts are for the animals. For fat animals are less generative than non-fat ones, as was said previously.[70] (The cause is that the fat too is a residue just as seed is, namely, concocted blood, but not concocted in the same way as seed is. So it is reasonable that when the residue has been used up to make fat what has to do with the semen is deficient.) And among the bloodless animals, the soft-bodied and soft-shelled animals are at their best around the time of pregnancy; for because they are bloodless and no fat occurs in them, what is analogous to fat in them is secreted to make the spermatic residue.

A sign that the female does not emit the sort of seed that the male does, and that generation is not due to the mixing of both, as some people say, is that often the female conceives without the pleasure in sexual intercourse occurring in her; and, again, when pleasure occurs no less [in her], and that, even though the male and the female keep an equal pace,[71] nothing comes to be unless the wet secretion of the so-called menses is present in proportion. That is why the female does not generate either when the menses are wholly absent or, for the most part, when they are present but being exuded, but rather after the purgation. For, at the one time, the capacity coming from the male and present in his semen has no nourishment or matter from which to compose the animal, while at the other time, the semen gets washed out

69. I.e., pure seed (728[a]26–27) or semen (729[a]22), since the menses are themselves seed (728[a]26), as are eggs (718[b]15).
70. 725[b]32–34.
71. *HA* 636[b]14–24.

because of the quantity of menses. But when the menses have occurred and have departed, what remains is composed [into an embryo]. And if the females conceive when the menses are not occurring, or during their occurrence but not later, the cause is that in the former case as much wet secretion occurs as remains after purgation in the fertile ones, but no excess liquid occurs to depart externally, while in the latter case the mouth of the uterus closes after the purgation. When, then, what departs is plentiful but the purgation is still taking place, although not enough to wash out the seed, that is when they conceive if they have sex. And there is nothing strange in the fact that it should continue after conception; for in fact the menses even recur afterward up to a point, but in small quantity and not throughout [pregnancy]. This, though, is a morbid condition, which is why it occurs in few females and infrequently. It is what occurs for the most part that is most in accord with nature.

That what the female contributes to generation is the matter, then, that this lies in the composition of the menses, and that the menses are a residue, is clear.

1.20
Menses as Impure Seed

The seed that some people think is contributed by the female during sexual intercourse, because an enjoyment much the same as that of the males sometimes occurs in females at the same time as a liquid secretion, this liquidness is not the spermatic one, but is special to the place in particular females.[72] For it is a secretion from the uterus and occurs in some but not in others; for it occurs in the pale-skinned and womanly, speaking for the most part, not in the dark and masculine-looking. Its quantity, when it occurs, is sometimes not in accord with that of the seed emitted, but far exceeds it. Further, one foodstuff's distinctness from another makes a great difference to whether less or more of this sort of secretion occurs—for example, some of the bitter ones make a noticeable difference to the quantity of the secretion.

The occurrence of pleasure in sexual intercourse is due to the emission not only of seed but also of breath, from the composition of which the emission of seed results. This is clear in the case of boys who are not yet capable of its emission but are near the age for it, and in infertile men; for, in all these, pleasure is produced by friction. And in those who have lost the capacity to generate, the bowel is sometimes loose because of the residue secreted into the bowel that is incapable of being concocted and becoming seed.

A boy too is like a woman in shape, and a woman is like an infertile man; for the female exists due to a certain incapacity, namely, due to being incapable of concocting seed from the nourishment in its last stage (which is either blood or its analog

72. The liquid may be vaginal mucus and the "sweating" produced during sexual arousal and vasocongestion.

in bloodless animals) because of the coldness of her nature. Just as in the bowel non-concoction produces diarrhea, then, so in the blood vessels it produces various hemorrhages, in particular the menses; for they too are a hemorrhage, but while the others are due to disease, this one is natural.

Evidently, then, it is reasonable that generation occurs from this. For the menses are seed that is not pure but needs work, just as in what has to do with the generation of wheat, when it has not yet been sifted, though the nourishment is present in it, but work is needed for their purgation. That is why, when the former is mixed with the semen and the latter with pure nourishment, the one generates and the other nourishes.

A sign that the female does not emit seed is that the pleasure in sexual intercourse is produced by touch in the same place as in males. And yet they do not emit this wet secretion from there.

Further, this secretion does not occur in all females, but in those that are quite sanguineous, and not even in all of them, but in those that do not have the uterus by the diaphragm and are not egg-laying. Further, nor does it occur in those that have not blood but its analog; for the precise thing that is blood in the former is a distinct aggregation in the latter. The cause due to which the purgation occurs neither in them nor in certain blooded animals, except the ones mentioned (those whose uterus is down below and are not egg-laying),[73] is the dryness of their bodies, which leaves little residue over, enough only for generation but not for external emission. But in all the ones that are live-bearing without first laying an egg—these are the human being and those four-footed animals that bend the hind leg inward (for all these are live-bearing without first laying an egg)—menses occur, unless they are deformed in the process of generation like the mule, but the purgation is not conspicuous as it is in the human beings. But how this occurs in each of the animals is described with exactness in the *History of Animals*.[74]

Among the animals, the greatest quantity of purgation occurs in women, and in men the emission of seed is greatest in proportion to their size. The cause is the composition of their body, which is wet and hot; for in the ones of this sort it is necessary for the greatest quantity of residue to occur. Further, they do not have the sort of parts in their body to which residue is diverted, as the others do; for they do not have a great quantity of hair on their body, nor excretions for bones, horns, and tusks.

Here is a sign that the seed is in the menses: at the same time of life, as was said previously,[75] this residue occurs in the males and the females show signs of menses, suggesting that the places receptive of the residue in each of the two become distinct at the same time, and as the neighboring places are made porous, a growth of pubic hair bursts forth. And when they are about to be distinct, the places get swelled up

73. Reading τισὶ πλὴν τοῖς εἰρημένοις, τοῖς κάτω ἔχουσι καὶ μὴ ᾠοτοκοῦσιν.
74. *HA* 521[a]21–31, 572[b]29–573[a]16, 574[a]31–[b]6, 581[b]1–11, 582[a]34–583[a]12 (but only some cases are described in these passages).
75. 727[a]5–10.

by the breath, more noticeably around the testicles in males, though it shows signs around the breasts as well, and in females more around the breasts; for when these are two fingers high, it is then that the menses occur in most females.

In those living things in which male and female are not separated, the seed is, as it were, an embryo. By an "embryo" I mean the primary mixture of female and male. That is also why one body comes from one seed—for example, one stalk from one grain of wheat, just like one animal from one egg (for twin eggs are two eggs). But in all kinds in which female and male are distinct, it is possible for several animals to come from one seed, suggesting that the seed in plants and that in animals are different in nature. There is a sign of this, for several young come from one mating in animals capable of generating more than one. It is also clear from this that the semen does not come from every part [of the body]; for separate [parts of it] would not from the outset be secreted by the same part [of the body], nor would they, having arrived there together, become separate in the uterus. Instead, it happens as is reasonable, since the male provides both the form and the starting-point of movement, while the female provides the body, that is, the matter. Like in the curdling of milk, where the body is the milk, and the fig juice or rennet is what contains the starting-point that provides the composition, so is what comes from the male when it is partitioned in the female. But due to what cause it is partitioned here into a larger number, here into fewer, and here not partitioned at all, will be for another account.[76] But because there is no difference in the form, at any rate, but only the proportion between what is divided and the matter, and neither so little that it does not concoct or compose the matter nor so much that it dries it up, it generates in this way many offspring. But from the primary thing doing the composing, from [what is] already one, only one offspring comes to be.

That the female does not contribute semen to the generation, then, but does contribute something, what the menses is composed of (or its analog in bloodless animals), is both clear from what was said and is in accord with the account based on universal investigations.[77] For it is necessary for there to be a progenitor and a from which. And, even if these are one, it is necessary for them to differ, at any rate, in form, and for the accounts of them to be distinct. And in those that have these capacities separated, it is necessary for both the bodies and the nature of the affecting one and the affected one to be distinct. If, then, the male exists as mover and affecter, and the female, insofar as it is female,[78] as capable of being affected, the female's contribution to the male's semen would be not semen but matter. And it is evident that this is precisely what happens; for the nature of the menses corresponds to the primary matter.

76. 771^{b}14–772^{b}12.

77. I.e., into coming to be generally, not just animal coming to be.

78. Reading ἢ θῆλυ.

1.21
How Male Seed Is a Cause of What Comes to Be

As regards these things, let them be determined in this way. At the same time, the answer to the next question to be investigated is evident from these considerations: **729ᵇ1** how it is that the male contributes to generation, and how it is that the seed from the male is a cause of what comes to be. Is it by being present in, and from the outset being a part of, the body of what comes to be, mixing with the matter provided by the female? Or does the body of the seed not have a share, but only the capacity and movement in it? For it is the latter that is the affecter, while what is composed and takes the shape is what remains of the residue in the female. This is evident both in accord with the account and with the facts.

For if we investigate the question in universal terms, it is evident that whenever one thing comes to be from an affected and an affecter, it is not by way of the affecter being present within what comes to be, nor, in general, is it so when one thing moves something and another is moved. But now the female, insofar as female, is a thing capable of being affected, while the male, insofar as male, is a thing capable of affecting and from which comes the starting-point of the movement. So, if we take the extremes of each, in which case the one is capable of affecting and moving something, the other capable of being affected and being moved, it is not from these that the one thing comes to be, except in the way in which the bed does from the carpenter and the wood, or the sphere from the wax and the form. It is clear, therefore, that it is not necessary for something to come away from the male, nor, if something does come away, is it necessary because of this for what comes to be to do so from that something by way of its presence within, but only by way of being mover and form, in the way that the cured person is also due to the craft of medicine.

And what happens in agreement with the account is also in agreement with the facts. For that is why some males, even though they copulate with the females, do not, it appears, insert any part into the female, but on the contrary the female inserts one into the male, as in the case of certain insects. For in those that do insert one, the effect that the seed produces in the female is produced in these insects by the heat and the capacity in the [male] animal itself, when the female brings into it the part that is receptive of the residue. And because of this these sorts of animals remain intertwined a long time, but when untwined generate quickly. For they copulate until [the capacity in the male] has composed [the matter in the female] in the way semen does. But after untwining they quickly emit the embryo; for they generate an incomplete thing; for all [animals] of this sort give birth to larvae.

But what happens in the birds and in the fishes of the egg-laying kind is the greatest sign that the seed does not come from all parts and that the male does not **730ª1** emit any part of the sort that will remain present in what comes to be, but generates

an animal only by the capacity in the semen, as we said[79] of insects in which the female inserts [a part] into the male. For if a hen happens to be conceiving wind-eggs and is then mated before the egg has changed from being wholly yellow to turning white, the eggs become fertile instead of wind-eggs; and if it is mated with a second cock while the egg is still yellow, the kind of all the chicks turns out to be in accord to the cock that mated it last. That is why some people who are serious about well-bred birds do things in this way, changing [the cocks] for the first and second matings, on the supposition that the seed is not mixed together with [the egg] and present within it, and that it did not come from all parts; for it would then have come from both cocks, so that the same parts would be possessed twice. Instead, by its capacity, the male seed establishes a certain state in the matter and nourishment that is in the female. For it is possible for the seed that came in second to do this by heating and concocting; for the egg gets nourishment as long as it is growing.

The same happens too in the generation of the egg-laying fishes. For when the female has laid the eggs, the male sprinkles the seminal fluid over them, and those eggs it reaches become fertile, while those it does not reach are infertile, suggesting that the male's contribution to the animals is not quantitative but qualitative.

That the seed, then, does not come from all [parts] in those that emit seed, and that the female does not contribute in the same way as the male to the generation of the offspring that are composed, but instead the male contributes a starting-point of movement and the female the matter, is clear from what has just been said. That is why, in fact, the female does not generate by itself; for it needs a starting-point, that is, something that will cause movement and give definition (although in some animals certainly, such as hens, their nature is capable of generating up to a point; for these do compose something, but the things they compose are incomplete, the so-called wind-eggs).

1.22
How the Male Contributes to Generation

It is also why the generation of what comes to be takes place in the female, although it is not into the male that either the male itself or the female emits semen, but rather both contribute to the female what comes to be from them, because the matter is in the female from which what is crafted comes. And it is necessary for some to be present from the outset, gathered together, from which the embryo is composed in the first instance, while other matter must continually be added in order that the embryo may grow. So it is necessary for giving birth to take place in the female; for the carpenter too is in close contact with the wood, the potter with the clay, and, in

79. $729^{b}26–28$.

general, every work on a thing and every last movement takes place in contact with the matter—for example, building takes place in what is being built.[80]

One may grasp from these cases how the male too contributes to generation; for not every male emits seed, and in the case of those males that do emit it, it is no part of the embryo that comes to be, just as nothing comes away from the carpenter to the matter of the pieces of wood he works on, nor is there any part of the craft of carpentry in what is being produced, but the shape—that is, the form—comes to be from the carpenter by means of the movement in the matter, that is, his soul, in which the form is present, and his scientific knowledge move his hands or some other part with a certain sort of movement—distinct when what comes to be from it is distinct, the same when what comes to be from it is the same—and the hands move the instruments, and the instruments move the matter. Similarly, the nature present in the male, in those that emit seed, uses the seed as an instrument and as possessing active movement, just as in craft productions the tools are in movement; for the movement of the craft is in a way in them.

Those, then, that emit seed contribute in this way to generation. But those that do not emit it, where the female inserts some part of itself into the male, do so like someone bringing the matter to the craftsman. For because of the weakness of these sorts of males, their nature is not capable of producing by other means, but even when it persists the movements have scarcely enough strength, and produce like modelers, not carpenters; for it is not by means of touching something else that it crafts what is being composed, but it does so itself by using its own parts.

1.23
Plant Reproduction

In all animals that move by walking the female is separated from the male, one animal being female and another male, though they are the same in form—for example, both human or both horse. In plants, on the other hand, these capacities are mixed and the female is not separated from the male. That is why in fact they generate from themselves and emit not semen but an embryo, which we call "seed." And this is well said by Empedocles in his poem: "Thus tall trees lay eggs, first the olive trees";[81] for the egg is an embryo, and from a certain part of it the animal comes to be, while the remainder is nourishment. And from part of the seed the growing plant comes to be, while the remainder becomes nourishment for the shoot and for the first root.

In a certain way the same thing happens too in those animals that have the female and the male separated. For when there is need for them to generate, they become inseparable, as in plants, and their nature tends to become one. This is precisely what

80. *Met.* 1050ᵃ28–34.
81. B79 DK.

is evident to the eye when they mix together and copulate, one animal coming to be from both.[82]

And for those that do not emit seed it is natural to remain intertwined for a long time until [the male] has composed the embryo—for example, the insects that copulate. But others so remain only until the male has emitted some part of what he introduces that will compose the embryo in a longer time—as, for example, in the case of the blooded animals. For the former keep together for some part of a day, while in the latter the semen takes several days to compose the fetus, though they let go when such a thing has been released. And animals are just like divided plants, as if, when they bear seed, one were to untwine and separate them into the female and male present within them.

And nature crafts all this in a reasonable way. For of the substance of plants there is no other work or action at all except the generation of seed, so that since this occurs through the copulation of the female and the male, nature has mixed these and arranged them together with each other. But these things have been investigated elsewhere.[83] The work of the animal, on the other hand, is not only to generate (for this is common to all living things), but also they all participate in a sort of knowledge, some in more, some in less, some in altogether little. For they have perception, and perception is a sort of knowledge. And its esteem or lack of esteem differs greatly as we look at it in relation to practical wisdom and in relation to things of the inanimate kind. For in comparison to being practically wise, participating only in touch and taste seems like nothing at all, but in comparison to plant or stone it **731^{b}1** seems a wondrous thing; for it seems that one would be content with even this share of knowledge, rather than lying dead and not being. It is by perception that animals differ from things that are merely living. But since it is necessary for it also to live, if it is an animal, when there is a need for it to accomplish the work of a living thing, it then copulates, mixes, and becomes like a plant, as we said.[84]

Among the animals, the hard-shelled animals are intermediate between the animals and the plants, and, as being in both, do the work of neither; for, as a plant, they do not have the female and the male, and do not generate in another, while, as an animal, they do not bear fruit from themselves as plants do, but are composed and come to be from a certain earthen and wet material. But their generation must be spoken about later.[85]

82. Reading ἕν τι ζῷον γίγνεσθαι ἐξ ἀμφοῖν.
83. 716^{a}1.
84. 731^{a}21–24.
85. 3.11.

BOOK 2

2.1
Sexual Dimorphism; Classification of Animals in Terms of Generation; Preformationism and Epigenesis

That the female and the male are starting-points of generation was said previously,[86] as was what their capacity is and the account of their substance. As for why the one becomes and is female and the other male, how it is so in virtue of necessity, of the first mover, and of a certain sort of matter, our account must try to explain as it proceeds, but how this is so because of the better and the cause-for-the-sake-of-which belongs to [the account of] a higher starting-point.

For since some beings are eternal and divine, while others admit of both being and not being, and since the good and the divine is always, in accord with its own nature, a cause of the better in the things that admit of it, while the non-eternal does admit of being and not being and of partaking in both the worse and the better, and since the soul is better than the body, and the animate than the inanimate because of the soul, and being than not being, and living than not living—due to these causes there is generation of animals; for since it is impossible for the nature of this sort of kind to be eternal, what comes into being is eternal in the [only] way that is possible for it. In number, of course, it is not possible (for the substance of the beings is in the particular one), but if indeed it were so, it would be eternal; in form, however, it is possible. That is why there is always human kind, animal kind, and plant kind.

732ᵃ1 Since the starting-point of these is the female and the male, it would be for the sake of generation that the female and the male exist among the beings.[87] But since the first cause of movement—in which belongs the account and the form—is better and more divine than the matter, it is also better that the more excellent be separated from the worse. That is why, in those in which it is possible and as far as it is possible, the male is separated from the female; for the starting-point of the movement, what the male stands for in what comes to be, is better and more divine—while the female is matter. The male, however, comes together and mixes with the female for the work of generation; for this is common to both.

Something lives, then, in virtue of participating in the male and the female (which is why even plants participate in life), but the animal kind is [what it is] in virtue of perception. And in pretty much all of those that move by walking, the female and the male are separated due to the causes stated; and some of these, as was said,[88] emit seed in copulation, while others do not. The cause of this is that the more estimable

86. 1.1–2.
87. Reading οὖσιν.
88. 721ᵃ30–ᵇ6.

animals are also more self-sufficient in their nature, so that they have greater size. But this cannot be had without soul-involving heat; for it is necessary for what has a greater size to be moved by a greater capacity, and the heat is something capable of causing movement. That is why, taking a general view, we may say that the blooded animals are larger than the bloodless ones, and those that move by walking larger than the stationary ones. And these are precisely the ones that emit seed because of their heat and size.

The cause due to which each of the two, the male and the female, exists has now been stated.

Among the animals, some complete and send forth externally an offspring similar to themselves—for example, those that are externally live-bearing. Others bring forth something unarticulated that has not yet acquired its own shape. Among the latter sort, the blooded ones lay eggs, while the bloodless ones generate larvae. An egg is different from a larva; for an egg is that from a part of which what comes to be comes to be (the remainder being nourishment for what comes to be), while a larva is that from the whole of which the whole of what comes to be comes to be.

Among the live-bearing animals that bring to light a complete offspring similar to themselves, some are internally live-bearing from the outset (for example, the human being, the horse, the cow, and—of the sea creatures—the dolphin, and the others of this sort). Others are at first internally egg-laying, then externally live-bearing (for example, the ones called "selachians").

Among the egg-laying animals, some release complete eggs—for example, the birds, the egg-laying four-footed animals, and the footless animals—for example, the lizards, the turtles, and most of the snake kind (for the eggs of these, when they have come out, do not take on growth). Others lay incomplete eggs—for example, the fishes, the soft-shelled animals, and the so-called soft-bodied animals; their eggs do grow in size once they come out.

All the live-bearing[89] animals are blooded, and the blooded ones that are not wholly infertile are either live-bearing or egg-laying. Among the bloodless ones, the insects give birth to larvae, whether they come to be from copulation or copulate themselves. For there are some insects of this sort, which, though they come to be spontaneously, are yet female and male, and from their copulation something comes to be, even though it is incomplete. The cause of this was stated previously elsewhere.[90]

Much overlapping of genera, however, occurs; for the two-footed animals are not all live-bearing (for the birds are egg-laying) nor all egg-laying (for the human being is live-bearing); nor are the four-footed animals all egg-laying (for the horse, the cow, and countless others are live-bearing) or all live-bearing (for the lizards, the crocodiles, and a large number of others are egg-laying). Nor does the having or not having of feet differentiate them; for there are also live-bearing footless animals (for

89. Secluding ἢ ᾠοτοκοῦντα.

90. A promise unfulfilled in the extant treatises.

example, the vipers and the selachians) and egg-laying ones (for example, the fish kind and the other snake kinds); and of the ones having feet many are egg-laying, many live-bearing (for example, the four-footed animals mentioned); and the internally live-bearing include both ones that have feet[91] (for example, the human being) and footless ones (for example, the whale and the dolphin). There is no dividing, then, in this way, nor is any of instruments for movement by walking the cause of this difference. Instead, the live-bearing ones are the animals that are more complete in nature and participate in a purer starting-point; for nothing is internally live-bearing if it does not take in breath and inhale. And the more complete ones are those that are hotter in nature and wetter and not earthen. And the defining mark of natural heat is [the presence of] the lung, when it is [well] blooded; for, in general, the ones that have a lung are hotter than those that do not, and of the former, the ones whose lung is not spongy nor firm nor poorly blooded, but rather [well] blooded and soft. And **733a1** just as the animal is complete, while the egg and the larva are incomplete, so what is complete naturally comes to be from what is complete.

The ones that are hotter due to having a lung, but drier in their nature, or are colder but wetter, either lay a complete egg or first lay an egg and then are live-bearing internally. For the birds and the hard-scaled animals, because of their heat, generate a complete thing, but because of their dryness they lay an egg [only]—the selachians are less hot than these, but wetter, so that they participate in both; for they are both egg-laying and internally live-bearing; they are egg-laying because they are cold, live-bearing because they are wet; for the wet is characteristic of life, while the dry is farthest from the animate. And since they are neither feathered, hard-scaled, nor soft-scaled (which are signs rather of a dry and earthen nature), the egg they generate is soft; for the earthen material does not rise to the surface in the egg any more than in themselves. And that is why they lay their eggs internally; for if it were to go outside, the egg, not having any protection, would be destroyed.

The animals that are rather cold and dry also lay eggs, but the egg is incomplete, and is hard-skinned because they are earthen, and because it is incomplete when emitted, in order that it be preserved it has a shelly protection to safeguard it. The fishes, then, being soft-scaled, and the soft-shelled animals, being earthen, generate hard-skinned eggs.

The soft-bodied animals, as themselves having bodies that are viscous in nature, preserve in the same way the incomplete eggs they emit; for they emit a large amount of very viscous material around the embryo.

The insects all give birth to larvae. On the other hand, all insects are bloodless, which is why in fact they give birth to larvae externally. But the bloodless animals do not all give birth to larvae, unconditionally speaking; for the insects, the ones that give birth to larvae and the layers of incomplete eggs (for example, the soft-scaled fishes, the soft-shelled animals, and the soft-bodied animals) overlap each other. For

91. Reading πόδας ἔχοντα.

the eggs of the latter are larva-like (for they take on growth externally), while the larvae of the former become egg-like after being emitted. The way they do so we will determine later on.[92]

We must understand how well and successively nature renders generation. For the more complete and hotter animals render their young complete with respect to **733ᵇ1** quality (though with respect to quantity no animal at all does so; for all, after they have come to be, take on growth), and these are the ones, of course, that generate animals internally from the outset. Those that come second do not generate complete ones internally from the outset (for they are live-bearing after first laying eggs), but it is externally that they are live-bearing. Others [coming third] generate not a complete animal but an egg, and this egg is complete. The next [coming fourth], having a nature yet colder than these, generate an egg—not, however, a complete egg, but one that is completed externally, as with the soft-scaled fish kind, the soft-shelled animals, and the soft-bodied animals. The fifth and coldest kind does not even lay eggs from itself, instead, this sort of affection happens externally, as was said;[93] for the insects give birth to larvae at first, and after being emitted, the larva becomes egg-like (for the so-called chrysalis has the capacity of an egg), then from this an animal comes to be, reaching in this third change the end of its generation.[94]

There are, then, some animals that do not come to be from seed, as was said previously.[95] All the blooded ones, however, come to be from seed, when they come to be from copulation, the male emitting semen into the female, on the entering of which the animal is composed and takes on its proper shape, some within the animals themselves when they are live-bearing, others in eggs, {. . .}[96] seeds, and other such secretions.

About these things there is a large puzzle as to how the plant, or any animal, comes to be from the seed. For it is necessary for what comes to be to come to be from something, to be due to something, and to be something. That from which is the matter. Some animals have their primary matter within themselves, having got it from the female—for example, those that come to be not as a live-born offspring but as a larva or egg. Others get it from the female for a long time through being suckled, as do those that come to be as live-born offspring not only externally but also internally. That from which a thing comes to be, then, is the matter of this sort.

But what is now being sought is not from what the parts come to be, but rather due to what; for either something external generates them, or something present in the semen and the seed, and is either some part of soul, or soul, or something that would have soul. For something external to generate each of the viscera or other **734ª1**

92. 3.9.
93. 733ª30.
94. We count two changes, from larva to egg, from egg to animal. The Greeks count the first as well as the last member of the series—larva, egg, animal.
95. 715ᵇ26–30.
96. There is a lacuna in the text at this point.

parts would seem unreasonable; for it is impossible for something to move a thing without making contact with it, or, without that something moving it, for the thing to be affected by it. In the embryo itself, therefore, something [of the relevant sort] is already present, either as a part of it or separated from it. But for it to be some other separated thing is unreasonable; for after the animal has come to be, does this thing pass away or does it remain? But nothing of this sort appears to be in it, nothing that is not a part of the whole plant or animal. But then again for it to pass away after having generated either all of the parts or some of them is absurd; for if it makes [only] some, what will make the rest? For if it makes the heart and then passes away, and the heart another part, by the same argument either all pass away or all remain. Therefore, it is preserved. Therefore, it is a part that is present in the seed from the outset. If, then, there is no part of the soul that is not in some part of the body, it would also be a part that is animate from the outset.

How, then, does it generate the other parts? For either all the parts—heart, lung, liver, eye, and each of the others—come to be simultaneously, or successively, as is said in the so-called Orphic poems; for there the author says that an animal comes to be like the weaving of a fishing net. That it is not simultaneously is evident even to perception; for some of the parts are already noticeably present [in the embryo], others not. And that this is not because they are too small to be visible is clear; for the lung is larger than the heart but is noticeable later in the initial stage of generation. Since, then, one is earlier and another later, does the one generate the other, and is the latter due to the contiguous one, or rather does this come to be [only] after that? I mean, for example, not that the heart, when it has come to be, generates the liver, and it something else, but that this is after that, as after a child a man comes to be but not due to it. The reason for this is that, in the things that come to be by nature or by craft, what is potentially such-and-such comes to be due to what is actually such-and-such, so that the form and shape [of the later thing] would need to be in the earlier thing—for example, the form of the liver in the heart. And in other ways too, the account is an absurd fabrication.

But then for any part of the animal or plant that comes to be to be present in the seed from the outset—whether it has the capacity to generate the other parts or not—is also impossible if all come to be from seed and semen. For it is clear that it is due to what produced the seed that it came to be, if indeed it is present in it from the
734b1 outset. But seed must come to be beforehand, and this is the work of its progenitor. Therefore, no part can be present in it. Therefore, the seed does not contain within itself, either, what generates the parts. But then neither can this be external. But it is necessary for it to be one or other of these two.

We must try, then, to resolve this [puzzle]; for perhaps something of what was said is not simple—for example, in what way exactly it is not possible for the generation of the parts to be due to something external. For there is a way in which it is possible, and another way in which it is not. Whether we speak of the seed, or of what the seed comes from, makes no difference, insofar as the seed has within it

the movement with which that other moved it. And it is possible for this to have moved that, and that this other, and for it to be like those wondrous automata. For their parts somehow contain a capacity when at rest, and when something external has moved the first of them, immediately the contiguous one becomes active. As, then, in the case of these automata the external thing is in a certain way moving them, not by making contact with any part now, but by having made contact with one, it is likewise in the case of what the seed came from, or what generated the seed, it moves by having once made contact, not by making contact still. In another way, however, it is the internal movement that does this, as [the process of] building does the house.

That there is, then, something that generates [the parts], though it does not do so as a this something nor as something present in it as an already completed thing, is clear.

But we must grasp how each part comes to be there, first positing as a starting-point that whatever comes to be by nature or by craft comes to be due to something actively being, from something potentially being, of the relevant sort. The seed, then, is of such a sort, and contains a movement and a starting-point of such a sort, that as the movement ceases each part comes to be and comes to be animate. For it is not a face without having soul, nor is it flesh; rather, when they have passed away, the one will be homonymously said to be a face and the other flesh, just as it would be if they were made of stone or wood. And the uniform parts come to be at the same time as the instrumental ones. And just as we would not say of an axe or other instrument, nor likewise of a foot or hand, that fire alone made it. And in the same way, neither would we say it of flesh; for of it too there is a certain work. Heat and cold would make them hard and soft, viscous or brittle, and whatever other affections of this sort belong to the animate parts, but when it comes to the ratio in virtue of which one is already flesh and another bone, this is no longer so; rather this is due to the movement that stems from the progenitor, which is actually what the thing potentially is, from which what comes to be comes to be, just as in the case of what comes to be in accord with craft; for heat and cold make the iron hard and soft, but what makes it a sword is the movement of the instruments containing the account belonging to the craft. For the craft is starting-point and form of what comes to be, but in another thing, while the movement belonging to the nature is in the thing itself, which stems from another nature that contains the active form.

Also, has the seed soul or not? The same argument applies to it as to the parts; for no soul will be in anything else whatever except in what it is in fact the soul of, nor will there be a part (other than homonymously, like a dead man's eye) that does not participate [in soul]. It is clear, then, that seed both has [soul] and is [a soul] potentially. But it is possible to be nearer and further potentially, as the geometer asleep is further than the one awake, and the latter than the one [actively] contemplating.

Of this process of generation, then, no part is a cause, but rather the primary external mover.[97] For nothing generates itself. But once it has come to be, from that point on it causes itself to grow. That is why indeed something comes to be first and not everything at the same time. And this first thing that comes to be is necessarily what contains the starting-point of growth; for whether plant or animal, this belongs to all alike, the nutritive part. (And this is what is generative of another like oneself; for this is the work of everything that is by nature complete, both animal and plant.) And this is necessary, because once something has come to be, it is necessary for it to grow. Therefore, though it was generated by something synonymous (for example, human being by human being), it grows because of itself. Therefore, it itself must be something if it causes growth. If, then, it is one something, and this a first thing, it necessarily comes to be first. So if the heart is the first thing to come to be in certain animals, and in those that do not have a heart the analog of this, the starting-point would be from this in the ones that have it, and in the others from its analog.

What the cause as starting-point is, then, in each case of generation, the primary mover and crafter, has been stated in response to the puzzles gone through previously.

2.2
The Nature of (Male) Seed

About the nature of the seed, someone might raise a puzzle. For seed when it emerges from the animal is coarse-grained and white, but when it cools it becomes liquid like water and its color is that of water. And this may seem strange; for while water does not become coarse-grained due to heat, the seed, on emerging from within the hot [animal], is coarse-grained, and on cooling becomes water. And yet watery liquids solidify, seed does not solidify if exposed to frost in the open air but liquefies, suggesting that the contrary of [cold] makes it coarse-grained. But then it is not reasonable either for it to be made coarse-grained by heat. For it is the things that
735[b]1 contain much earth that get composed and coarse-grained on boiling—for example, milk. It should, then, solidify on cooling. But as things stand nothing of it becomes solid, instead all of it becomes like water.

This, then, is the puzzle. For suppose it is composed of water: it is evident that water does not get coarse-grained due to heat, while the seed on emerging is coarse-grained and hot and the body it emerges from is hot; but if it is composed of earth, or is a mixture of earth and water, then it should not all become liquid and [like] water.[98]

Or is it that we have not distinguished all the results? For it is not only liquids composed of water and earthen material that get coarse-grained, but also those composed of water and breath—for example, foam becomes more coarse-grained and

97. I.e., the proximate one.
98. Reading καὶ ὕδωρ.

white, and the smaller and less clear the bubbles in it, the whiter and firmer the mass appears. Olive oil[99] is also affected in the same way; for on mixing with breath it gets coarse-grained, which is why the whitening [oil] becomes more coarse-grained—the watery material in it gets disaggregated by the heat and becomes breath. Lead ore[100] too, when mixed with water and olive oil and beaten, makes from a smaller mass a bigger one, from something liquid something firm, and from something black something white. The cause is that breath gets mixed in with it, and it makes the mass [bigger] and the whiteness show through, as in foam and snow; for snow too is a foam. And water itself on mixing with olive oil becomes coarse-grained and white; for, in fact, due to the friction breath gets enclosed and the oil itself also contains much breath; for oiliness is characteristic of breath, not of earth or water. That is also why it floats on the surface of water; for the air in it,[101] as if in a vessel, bears it up and makes it float and is the cause of its lightness. And in cold spells and frosts too oil gets coarse-grained, but does not solidify; in fact, because of its heat it does not solidify (for the air is hot and not freezable), but because the air is condensed and compacted by the cold, the oil becomes coarse-grained.

Due to these causes seed too is firm and white when it emerges from within, that is, due to the internal heat [of the animal], it contains much hot breath, but having emerged, when the heat has evaporated and the air has cooled, it becomes liquid and black; for, as in the case of phlegm, the water, and any small quantity of earthen material there may be, remain in the seed too as it dries.

Seed, then, is jointly composed of breath and water, and the breath is hot air. **736^{a}1** That is why it is liquid in nature, because it is composed of water. For what Ctesias of Cnidos said about the seed of the elephants is manifestly false. For he says that it hardens so much in drying that it becomes like amber. But this does not happen; for though one seed is of necessity earthier than another, and most so in those to which, in accord with the mass of their bodies, much earthen material belongs, it is coarse-grained and white because of being mixed with breath. For, in fact, the seed is white in all cases; for Herodotus[102] is not speaking the truth in saying that the semen of Ethiopians is black, as if it were necessary for everything belonging to someone with black skin to be black—and this even while seeing that their teeth are white! The cause of the whiteness of seed is that the semen is a foam, and foam is white, and most so that composed of the smallest particles, and small in the way that each bubble is invisible, precisely as happens indeed in the case when water and olive oil are mixed and beaten, as was said previously.[103]

99. *Mete*. $383^{b}20$–$384^{a}2$.
100. Lead sulfide.
101. Olive oil has breath in it and "breath is hot air" ($736^{a}1$).
102. 3.101.
103. $735^{b}21$–23.

Even the ancients[104] did not fail to notice that the nature of seed is foam-like (*aphrôdês*). At any rate, they named the goddess [Aphrodite] who is in control of sexual intercourse after this capacity.

The cause of the puzzle mentioned has now been stated, and it is evident that it is due to it that seed does not solidify either; for air does not solidify.

2.3
Male Seed Contributes Movements Alone; the Inheritance of Nutritive and Perceptual Soul and Understanding; the Role of Breath; Active and Potential Possession of Soul

The next puzzle to be stated is this. If, in the case of the animals in which semen is emitted into the female, what enters is no part of the embryo that comes to be, where is the corporeal part of it diverted to, if indeed it does its work by means of the capacity it has within itself? It is necessary to determine whether what is being composed in the female receives something, or nothing, from what has entered her, but also, concerning the soul in virtue of which an animal is so called (and it is an animal in virtue of the perceptual part of the soul), whether it is present within the seed and the fetus or not, and where it comes from [if it is]. For one could not regard the fetus as soulless, as in every way deprived of life; for both the seeds and the embryos of animals are no less alive than plants, and are fertile up to a certain point. That they have nutritive soul, then, is evident (and why they must acquire this first is evident from the determinations about the soul made elsewhere[105]), but as they proceed they **736b1** also have perceptual soul in virtue of which they are animals {. . .}.[106] For they do not at the same time become animal and human, or animal and horse, and likewise in the case of the other animals; for the last thing to come to be is the end, and the end of the coming to be of each thing is what is special to it. That is why as regards understanding, when, how, and from where it is acquired by those that participate in this starting-point involve a very great puzzle, and we must try hard to get a grasp on [these things] in accord with our capacity and to the extent possible.

As for the seeds and fetuses that are not yet separable, it is clear that they must be regarded as possessing the nutritive soul potentially, but not actively, until, like separated fetuses, they are drawing in nourishment and doing the work of this sort of soul; for, at first, all things of this sort seem to live the life of a plant. And it is clear that perceptual soul and understanding soul must be spoken about accordingly; for it is necessary for all soul to be possessed potentially before being possessed actively.

104. E.g., Diogenes of Apollonia A24 DK.
105. *DA* 2.4.
106. There is a lacuna in the text at this point.

For either they must all come to be [in the menses or matter] without existing beforehand, or they must all preexist, or some must, but not others; and they must be generated either in the matter without having entered in the male's seed, or in it having come from there; and in the male they must either all come to be [in the seed] from outside it, or none from outside, or some but not others. It is evident from the following that it is impossible for all to be present beforehand; for it is clear that it is impossible for all starting-points whose activity is bodily to be present without body (for example, walking without feet). So they cannot enter from outside; for they can neither enter by themselves, being inseparable, nor enter in a body; for the seed is a residue that comes to be by a change in the nourishment. It remains, then, that the understanding alone enters from outside and alone is divine; for bodily activity has nothing in common with its activity.

The capacity of all soul seems to be associated with a body distinct from and more divine than the so-called elements. And as souls differ from each other in esteem and lack of esteem, so too this sort of nature differs. For within the seed of everything there is present precisely that which makes the seeds be fertile, the so-called hot. This is not fire or that sort of capacity, but the breath enclosed within the seed and within the foamy part—that is, the nature in the breath, which is an analog of the element belonging to the stars. That is why fire does not generate any animal, nor, it is evident, anything composed in things affected by fire, whether wet ones or dry ones. But the heat of the sun and that of animals do generate—and not only does the heat due to the seed do so, but also if there happens to be some other residue belonging to its nature, still it too possesses a life-giving starting-point. That, then, the heat in animals is neither fire nor comes from fire is evident from these considerations.

As for the body of the semen, in which comes away part of the seed of the soul-involving starting-point,[107] part of which is separable from the body in all the ones in which a divine something is enclosed (and what is called "the understanding" is of this sort) and part inseparable—this body of the semen dissolves and evaporates, having a liquid and watery nature. That is why one should not look for it always to emerge outside, nor for it to be any part of the composed shape, any more than the fig juice that composes the milk; for it too changes and is no part of the mass that is being composed.

In what way, then, embryos and semen possess soul, and in what way they do not, has been determined; for they possess it potentially, but actively they do not.

Because the seed is a residue, then, and is being moved with the same movement as the one with which the body grows when the nourishment in its last stage is being partitioned, when it comes into the uterus, it composes and moves the female's residue with precisely the same movement that it is moving with itself. For that too is a residue, and it contains all the parts potentially, but none actively. For it even contains potentially the sorts of parts due to which there is a difference between

107. Reading τὸ σπέρμα τὸ τῆς ψυχικῆς ἀρχῆς. See *MA* 703^{a}9–27.

male and female. For just as from deformed progenitors sometimes deformed offspring come to be and sometimes not, in the same way too from a female a female sometimes comes to be, and sometimes not a female but a male. For the female is like a deformed male, and the menses are seed, but not pure seed; for there is one thing alone that they do not contain, the starting-point of soul. And because of that, in those animals in which wind-eggs occur, the egg that is being composed has the parts of both, but does not have the starting-point, which is why it does not become animate; for this starting-point is brought in by the male's seed. But once the residue of the female has partaken of this sort of starting-point, an embryo comes to be.

{Things that, though liquid, are of a corporeal nature when heated get surrounded by a crust, like the crusts that form on boiled ones as they cool. And viscosity holds all **737[b]1** bodies together. And it is precisely this, as they develop and become larger in size, that is acquired by what is sinewy in nature, which is precisely what holds together the parts of an animal, being sinew [itself] in some and its analog in others. And of the same shape are skin, blood vessel, membrane, and everything of that kind; for these differ in the more and the less and, in general, in excess and deficiency.}[108]

2.4
Generation of the Human Beings and Other Complete Animals; Development and Nutrition of the Embryo (1)

Among the animals having a more incomplete nature, once a complete embryo, though not yet a complete animal, has come to be, it is emitted externally; the causes of this were stated previously.[109] A fetus is complete from the moment when it is either male or female—that is, in the case of those animals where this distinction exists among the offspring; for there are some that generate offspring that are neither female nor male: the ones that themselves come to be neither from male and female progenitors nor from sexual intercourse between animals. About the generation of these we will speak later.[110]

The complete animals, the ones that are internally live-bearing, until they have generated a [complete] animal and sent it forth externally, keep the animal that comes to be naturally united with and within themselves.

The ones that are externally live-bearing but first internally egg-laying, once they have generated a complete egg, in some cases the egg is released, just as in the externally egg-laying animals, and the animal comes to be from the egg inside the female; in other cases, when the nourishment in the egg has been used up, the animal is completed by [nourishment] from the uterus, and that is why the egg is not released

108. This paragraph seems misplaced.
109. 732[a]24–733[b]23.
110. 3.9 (insects), 3.11 (hard-shelled animals).

from the uterus. This is the difference the selachian fishes exhibit, which later must be discussed by themselves.[111]

Now, however, we must first start with the first ones. And these are the live-bearing ones, and of these the human being is first.

In all animals the secretion of seed comes about just like that of any other residue. For each residue is spatially moved to its proper place without being forced by breath or being compelled by any other cause of this sort, as some people say it is, claiming that the sex organs draw the residue like cupping-glasses, forcing it by means of the breath (as if it were not possible either for this residue or that of the dry or liquid nourishment to have spatially moved elsewhere except by being forced), on the supposition that they aid in the emission of these residues by holding the breath. But this is common to all cases in which one must move something; for it is because of holding back the breath that strength springs up. Besides, even without this force **738^{a}1** the residues are secreted during sleep if the [proper] places are full of residue and relaxed. One might as well say that it is by the wind that the seeds of plants are on each occasion secreted to the places where they are in the habit of bearing fruit. Now, the cause of this, as was said,[112] is that in all animals there are parts receptive of the residues, both for the useless one (for example, for the dry and the liquid one[113]) [and for the useful ones]; and for the blood there are the so-called blood vessels.

In the case of females, there is the place around the uterus. The two blood vessels, the great blood vessel and the aorta,[114] are partitioned higher up into many thin blood vessels that end in the uterus. When these are overfilled from the nourishment, and the [female] nature, because of its coldness, is not capable of concocting it, it is secreted through the narrowest blood vessels into the uterus. But, because of its thinness, the uterus is incapable of receiving the excessive quantity, and so the affection that comes about is a sort of hemorrhage. The period is not exactly arranged in women, but it tends reasonably to occur when the moon is waning;[115] for the bodies of animals are colder when their environment happens to become so, and the times of new moon are colder because of the moon's complete waning, which is why too the end of the month is stormier than the middle. When the residue has changed into blood, then, the menses tend to occur in the period stated. But when the residue has not been concocted, a small quantity is always secreted, and this is why "whites"[116] occur in females while they are still small, in fact, children. If both these secretions of residues are moderate, their bodies are preserved, inasmuch as their occurrence is a purgation of the residues that are causes of their bodies being diseased. If, on the

111. 3.3.
112. 737^{b}28–30.
113. Reading οἷον τῇ τε ξηρᾷ καὶ τῇ ὑγρᾷ.
114. The vena cava and the whole venous system, on the one hand, and the aorta and the whole arterial system, on the other.
115. There is in fact no correlation between the lunar cycle and the menstrual cycle.
116. *HA* 581^{b}2.

other hand, they do not occur, or occur excessively, they do harm; for they produce either diseases or an emaciation of their bodies. That is why "whites," if continuous and excessive, subtract from the growth of girls.

Of necessity, then, this residue occurs in women due to the causes stated; for since their nature is incapable of effecting concoction, it is necessary for a residue to occur, not only from the useless nourishment, but also from the blood in the blood vessels, which overflows when it fills the thinnest blood vessels. But for the sake of the better and the end, nature makes full use of it in this place[117] for the sake of generation, in such a way that another thing of the same kind occurs; for [the menses] is already potentially, at any rate, of the same sort as the body whose secretion it is.

In all females, then, it is necessary for a residue to occur, more though in the quite sanguineous ones, and, among these, most in the human being. But in the others too it is necessary for some composite to be collected in the uterine place. The cause of there being more in the quite sanguineous ones and most in the human being was stated previously.[118]

But though a residue of this sort is present in all females, it is not present in all males—for some males do not emit semen, but just as the ones that do emit it craft, by means of a movement within the semen, what is being composed from the matter present in the females, so the ones of this sort generate and compose it by means of a movement within themselves present in that part from which the seed is emitted. This is the place around the diaphragm in all those that have one; for the starting-point of the nature [of an animal] is the heart or its analog, while the lower [place] is an appendage that is for the sake of this. The cause, then, of not all males having a generative residue, while all females do, is that an animal is an animate body. And always the female provides the matter, while the male provides the crafter; for this is the capacity, we say, that each of them possesses, and being female or being male consists in this. So, while it is necessary for the female to provide body and mass, for the male it is not necessary. For neither is it necessary for the instruments or the producer to be present in what is coming to be. But it is the body that comes from the female, the soul from the male; for the soul is the substance of a certain body.

Because of this, in fact, if there is sexual intercourse between a female and a male animal that are not of the same kind (and there is sexual intercourse if their times [of heat] are equal, their pregnancies are quite similar, and the sizes of their bodies not too far apart), the first offspring has a common similarity to both (for example, the offspring of the fox and the dog, of the partridge and the chicken), but as time goes on and one offspring comes from another, the end result takes after the female in shape, just as alien seeds take after the region; for it is what provides the matter and the body for the seed.

117. The uterus.
118. 727[a]21–25, 728[a]30–[b]14.

And because of this the part in the females that is receptive—the uterus—is not [simply] a duct, but rather has dimension, while the males that emit seed have ducts, and these are bloodless. **739^{a}1**

Once each of the residues is in its own proper place it becomes that residue. Before then nothing is one, unless with much force, that is, contrary to nature.

The cause of the secretion of the generative residues in animals has now been stated. 5

But when the seed from the male (in those animals that emit seed) has entered, it composes the purest part of the residue—for the greater part of the menses, being liquid, is useless too, just as the most liquid part of the male semen is, even of a single emission. And the earlier part is more infertile than the later in most cases; for it 10 contains less soul-involving heat due to being unconcocted, while the concocted part has thickness and is more corporeal.

In those cases, whether of women or of other female animals, where an external emission does not occur, because there is not much useless residue present in this sort of secretion, as much occurs within them as is retained within those animals that emit 15 it externally, namely, what is composed by the capacity of the male that is present in the seed secreted by him, or by the part analogous to the uterus being inserted into the male, precisely as is seen to happen in the case of certain insects.

That the liquid accompanying sexual pleasure that is produced in females contrib- 20 utes nothing to the embryo was stated previously.[119] It might especially seem to do so because in women too, just as in males, so-called wet dreams occur at night. But this is no sign of anything; for in fact the same thing occurs in young men who are about to, but do not yet, emit semen, in fact emit nothing, or still more in those who emit something infertile. 25

Without an emission from the male in sexual intercourse, then, and without the womanly residue, whether emitted externally or whether present in sufficient quantities internally, it is impossible to conceive. Females conceive, however, without the pleasure that usually comes about in them during sexual intercourse, if the place 30 happens to be in heat and the uterus has descended within. But, for the most part, conception does occur this way because, when the secretion takes place, which is usually accompanied by pleasure both in males and in women, the mouth of the uterus has not closed. And, when this is so, there is also an easier passage for the seed of the male.

The emission does not take place within the uterus, as some people think (for 35 the mouth of the uterus is narrow), but rather in front of it, precisely where the female emits her wet secretion in some cases, is where the male too emits [his semen]. **739^{b}1** Sometimes it remains in this place, sometimes, if the uterus happens to be suitably disposed and hot due to the purgation, it draws [the semen] in. A sign of this is that pessaries, though wet when applied, are dry when removed. Further, in those 5

119. 727^{b}33–728^{a}1.

animals that have the uterus near the diaphragm, as the birds and the live-bearing fishes do, it is impossible for the seed not to be drawn in there, but instead to enter when emitted.[120] And this place, because of the heat present in it, does draw in the semen. And the secretion and collection of the menses kindle heat in this part, so that it is like conical vessels which, having been washed out with something hot, draw water into themselves when the mouth is turned downward.[121] And this is the way in which the drawing in occurs—it does not in any way occur, as some say, due to the instrumental parts involved in sexual intercourse. And the reverse process happens in fact for those who say that the female also emits seed; for if the uterus emits any outside itself, it will have to draw it back in again, if indeed it is to be mixed with the semen of the male. But for it to occur in this way is superfluous, and nature produces nothing superfluous.

When what is secreted in the uterus by the female has been composed by the semen of the male, what it does is much the same as what rennet does in the case of milk—for in fact rennet is milk that contains vital heat, which brings together what is similar into one and composes it, and the semen in relation to nature of the menses has the same effect; for the nature of milk and menses is the same.[122] When, then, the corporeal part comes together, the liquid one is secreted and, as the earthen parts dry out, membranes form in a circle around it. And this happens of necessity and for the sake of something; for it is both necessary for the extreme surfaces to dry out when heated and becoming cold, and the animal[123] must not be in liquid but separated from it. Among these [separators] some are called "membranes," others "choria"—they differ by the more and the less. They are present in egg-laying and live-bearing animals alike.

When the embryo is once composed, it does things in much the same way that sown seeds do. For the first starting-point[124] is also present in the seeds themselves. And when this, which previously was present potentially, has been distinctly formed, the shoot and the root are sent off from it. And it is by the root that it gets its nourishment; for the plant needs growth. So too in the embryo in a certain way all the parts are present potentially, but the starting-point is farthest along the route.

That is why the heart is the first to be distinctly formed actively. This is clear not only to perception (for it happens this way), but also to reason; for when what is coming to be is distinctly formed and free from both parents, it must manage for itself, just like a son who has set up house away from his father. So that is why it must have a starting-point from which even the later orderly arrangement of the body in animals derives. For if it is to come in from the outside at some time and be present in it later, not only might one be puzzled as to the time, but also because it is necessary,

120. Aristotle calls the ovarian passages of birds and fishes a "uterus."
121. As in cupping.
122. Since both are late stages in the concoction of nourishment.
123. The fetus.
124. I.e., nutritive soul.

when each of the parts is being separated out, for this starting-point to be present first, the one from whose presence both the growth and the movement of the various parts derives.

That is why all those who say, like Democritus, that the external parts of animals become disaggregated first, and later the internal ones, do not speak correctly. It is as if they were speaking of animals made of wood or stone; for things of this sort have no starting-point at all, while all animals have one and have it within. That is why the heart is manifestly the first thing to become distinct in all blooded animals; for it is a starting-point of both the uniform and non-uniform parts. For this already deserves to be called the "starting-point" of the animal and its composition at the moment when it needs nourishment; for what is [an animal] of course grows. And for an animal nourishment in its last stage is blood or its analog, and of these the blood vessels are the receptacle. That is why the heart is the starting-point of these too. This is clear from the *History of Animals*[125] and the *Dissections*.

Since the embryo is already potentially an animal, but is incomplete, it is necessary for it to get its nourishment from elsewhere. That is why it uses the uterus, that is, the mother to get nourishment, just as a plant uses the earth, until it is complete to the point of being already an animal capable of movement by walking. That is why nature has first traced out the two blood vessels from the heart, and from these hang smaller blood vessels near the uterus, forming what is called the "umbilical cord." For the umbilical cord is a blood vessel, consisting of one vessel in some animals, and of several in others. Around these is a skin-like sheath, because the weakness of the blood vessels needs preservation and shelter. The blood vessels are attached to the uterus like roots, and through them the embryo gets its nourishment. For it is for the sake of this that the animal remains in the uterus, and not, as Democritus says, so that the parts may be molded in accord with the parts of the mother. This is evident in the case of the egg-laying animals; for they get their disaggregation in the eggs, when they have separated from the matrix.[126]

But one might raise a puzzle, if the blood is nourishment, and the heart, being already filled with blood, is the first thing to come to be, and the nourishment comes from outside, where did the first nourishment[127] enter from? Perhaps it is not true that all of it comes from outside, but rather, just as with the seeds of plants, where there is something of this sort present in them which at first has a milky appearance, in the same way too, the residue of the matter in animals of which they are composed is their nourishment from the outset.

The growth in the embryo occurs, then, by means of the umbilical cord in precisely the same way as the growth in plants does by means of the roots, and as in

125. 3.3.
126. I.e., the cervix including the orifice of the womb. *HA* 510^{b}14.
127. I.e., the blood already in the heart when it first came to be.

animals themselves when they are free of the nourishment within themselves. These issues must be spoken about later, at the opportune time for the proper accounts.[128]

The disaggregation of the parts, however, does not occur in the way that some people suppose,[129] by like naturally being carried to like (for in addition to the many other difficulties involved in this account, it follows that each of the uniform parts comes to be separately, for example, bones by themselves, and sinews and flesh by themselves, if one accepts this cause). Instead, it is because the residue of the female is potentially such as the animal is by nature and each of the parts is present in it potentially, but none actively, and it is due to this cause that each of them comes to be, and because, when what can affect and what can be affected make contact in the way in which one can affect and the other can be affected (by "way," I mean, how, where, and when), then straightaway the one affects and the other is affected. The female provides the matter, while the male provides the starting-point of the movement. And as the things that come to be due to craft come to be because of its instruments—or to put it more truly, because of the movements of these—and this is the activity of the craft, and the craft is the shape of the things that come to be that is present in something else, so it is with the capacity of nutritive soul. Just as it also does in the animals and plants themselves later on, it generates growth from nourishment, using heat and cold as instruments (for it is in these that its movements are present and a certain account of each [part of the animal]), in the same way as well it composes from the outset what is by nature coming to be. For the matter by which the thing grows is the same as that of which it is first composed, so that the productive capacity [of growth] is the same as the starting-point of [the animal]; although it is greater. If, then, it is the nutritive soul, it is also the generative one. And it is the nature of each thing, present in all plants and animals, while the other parts of the soul are present in some living things, not present in others.

In plants the female is not separated from the male. In some of the animals, however, it is separated, and in these the female has need of the male in addition.

2.5
Why Female Needs Male

And yet one might be puzzled as to what cause this is due to. If indeed the female possesses the same soul [as the male] and the matter is the residue of the female, why has the female need of the male in addition, why does it not itself generate from itself? The cause is that animal differs from plant by perception. And it is impossible for face, hand, flesh, or any other part to exist without perceptual soul being present in it either actively or potentially, whether in some way or unconditionally; for it will

128. 3.2.
129. E.g., Hippocrates, *The Nature of the Child* 17.1–9.

be like a corpse or part of a corpse. If, then, it is the male that is productive of this sort of soul, in cases where the female and the male are separated, it is impossible for the female itself to generate an animal from itself; for what was mentioned[130] is the being for what is male.[131] But that there is a reason for the puzzle stated is evident from the case of those birds that lay wind-eggs, since it shows that up to a point the female can generate. But this too involves a further puzzle as to what way we are to say their eggs are alive; for it is neither possible for it to be in the way that fertilized eggs are (for then an actually animate thing would come to be from them), nor again in the way that wood or stone is. For there exists for these eggs as well [as for fertile ones] a sort of passing away, suggesting that previously they in a way participated in life. It is clear, then, that they possess a sort of soul potentially. But what sort of soul is it? It is necessary, surely, that it be the last. And this is the nutritive; for it is present alike in all animals and plants. Why, then, does it not complete the parts and the animal? Because these must possess perceptual soul; for the parts of animals are not like those of plants. That is why there is a need for the contribution of the male; for the male is separated from the female in these cases. And this is precisely what happens; for wind-eggs become fertile if in a certain period of time the male mates with the female. But the cause of these things will be determined later on.[132]

If there is any animal kind that, though the female exists, contains no separated male, it is possible that this generates an animal from itself. Though this precise thing has not been observed in a reliable way up to now at least—a case in the fish kind does make one hesitate; for among the ones called "erythrinus" no male has so far been seen, while females and females full of embryos have been. But of this we have as yet no reliable experience. Also, ones that are neither female nor male exist in the fish kind—for example, the eels and the mullet kind found in marshland rivers.

But in those animals where the female and the male are separated, it is impossible for the female by itself to bring generation to a complete end; for otherwise the male would be pointless, and nature produces nothing pointless. That is why in animals of this sort the male always completes the generation. For he produces the perceptual soul in [the embryo] either due to himself or due to his semen.

Because the parts are present potentially in the matter, once the starting-point of movement has come to be, just as in those wondrous automata, one thing follows another in succession. And what certain of the natural scientists[133] must mean when they say that "like is naturally carried to like" is not that the parts move in the sense of changing their places, but rather that they remain where they are and undergo alteration in softness, hardness, color, and the other differences of uniform things—becoming actively what they previously were potentially.

130. I.e., being productive of perceptual soul.
131. Reading ἄρρενι.
132. 750^{b}3–751^{a}30, 757^{b}1–30.
133. In particular, Hippocratics.

What comes to be first is the starting-point. This is the heart in the blooded animals, and its analog in the others, as was said often.[134] And it is evident not only to perception that it comes to be first but also around the last moments; for the heart is what life leaves last. And it happens in all cases that the last to come to be is the first to leave, and the first last, as if nature ran a double course, turning back to the starting-point from which it came. For coming to be is from what is not to what is, and passing away from what is back again to what is not.

2.6
Development of the Embryo (2)

After the starting-point, as was said,[135] the internal parts come to be earlier than the external ones. The larger parts become apparent earlier than the smaller ones, although some of them do not come to be earlier. First, the parts above the diaphragm become articulated and are superior in size, while what is below is smaller and not distinctly formed. And this happens in all cases in which the upper and the lower are distinctly formed, except in the insects. In those that are given birth to as larvae, growth occurs toward the upper part; for the lower part is smaller from the start. Lack of distinction between the upper part and the lower parts, among the animals that move by walking, exists only in the soft-bodied animals. And what was just said applies in the case of the plants as well: the upper body comes to be earlier than the lower. For the seeds send out roots earlier than shoots.

The parts of animals are distinctly formed by breath—not however by that of the female progenitor or of [the embryo] itself, as some of the natural scientists[136] say. This is evident in the case of the birds, the fishes, and the insects; for some of these, after being separated from the female progenitor, come to be from an egg, within which they get their articulation, while other animals do not breathe at all, but are given birth to as larvae or as eggs. Others, though they breathe and get their articulation within the womb, do not breathe until the lung has got its end,[137] the preceding parts too getting their articulation in this way before the animals breathe. Further, the many-toed four-footed animals—for example, the dog, the lion, the wolf, the fox, and the *thôs*[138]—all generate blind young, and the eyelid does not divide until some time after their birth. So it is clear that it is also the same way in the case of all the other parts: just as its quality and its quantity come to be, preexisting potentially but later actually, due to the same causes due to which its quality is distinctly formed, and

134. E.g., 738ᵇ16–17, 740ᵃ3–4, 17–18, 22–23.
135. 740ᵃ12–23.
136. Hippocratics again.
137. I.e., its articulation.
138. *HA* 507ᵇ17.

two things come to be from one [eyelid]. But for breath to be present is necessary, because it is wet and hot, the hot affecting and the wet being affected.

Some of the ancient natural scientists attempted to state which part comes to be after which, but had not very much experience of the facts. For in the case of the parts, as with other things, one is naturally prior to another. But, in fact, something is [said to be] prior in many ways; for the for-the-sake-of-which and what is for the sake of this are different, and of these the latter is prior in coming to be, the former in substance.[139] But what is for the sake of this also exhibits two differences; for one is what the source of movement is, and the other is what the for-the-sake-of-which uses. I mean, for example, what is generative and what is an instrument for what comes to be; for of these, one must be possessed prior, the one capable of affecting (for example, the teacher is prior to the one who learns), and other posterior (for example, the pipes to the one learning to play them); for it is superfluous for those to possess them who do not have the scientific knowledge of how to play them.

There are, on the one side, three things: one is the end, which we say is [the] for-the-sake-of-which; second, the starting-point that is capable of causing movement in, and is generative of, the things that are for the end's sake (for what is productive and generative, insofar as they are such, are such in relation to what is produced and what comes to be); third, what is useful, that is, what the end uses. On the other side, it is necessary, first, for there to be present some part in which the starting-point of the movement resides (for even from the outset this part is a part of the end and the most controlling one); next after this, the whole and the end; thirdly and finally, the instrumental parts that these put to various uses. So, if there is something of this sort that is precisely what is necessarily present in animals, containing the starting-point and end of their entire nature, it is necessary for it to come to be first—first, insofar as it is capable of causing movement, but, insofar as it is a part of the end, along with the whole.

So those instrumental parts that are generative in nature must always be present themselves prior [to the others] (for, as a starting-point, they are for the sake of something else); those parts that are not of this sort, but are for the sake of something else, posterior. That is why it is not easy to determine which parts are prior, the ones that are for the sake of something else, or the one these are for the sake of. In fact, the parts capable of causing movement intrude [between the other parts], because they are prior to the end in coming to be, but it is not easy to determine between the parts capable of causing movement and the instrumental parts [as to which is prior]. And yet in accord with the present methodical inquiry we must inquire about what comes to be after what; for the end is posterior to some parts and prior to others. And because of this the part that contains the starting-point comes to be first, next the upper body. That is why the parts around the head and the eyes appear largest from the start in embryos, while the parts below the navel—for example, the legs—appear

139. *Met.* 1035^{b}14–27.

small. For the lower parts are for the sake of the upper ones, and are neither parts of the end nor generative of it.

But people do not speak correctly, not even about the necessity belonging to "what it is due to," who say that "this is the way it always comes to be," and consider this to be a starting-point in these cases. Thus Democritus of Abdera says that of what is unlimited[140] there is no starting-point, but what something is due to is a starting-point and what is always is unlimited, so that to ask for what it is due to in cases of this sort, he says, is to seek a starting-point for what is unlimited. And yet according to this argument, according to which it is fitting not to seek what the thing is due to, there will be no demonstration whatever of what is eternal. But it is evident that there are many, both of things that always come to be and of things that always are, since the triangle always has angles equal to two right angles and the diagonal is eternally incommensurable with the sides, but nonetheless there is a cause and a demonstration of these things. While, then, it is correctly said that it is not fitting to seek a starting-point in all cases, it is not correctly said of all the things that always are and always come to be, but [only] of those that really are starting-points of what is eternal; for of a starting-point there is another sort of knowledge and not a demonstration. A starting-point in the case of immobile things is the what-it-is, but in the case of things that come to be there are immediately several starting-points—although the way [each is a starting-point] is distinct and not the same for all. One of this number is the starting-point from which the movement comes. That is why all the blooded animals have a heart first, as was said at the start,[141] while in the other animals it is the analog of the heart that comes to be first.

743ᵃ1 From the heart, the blood vessels extend throughout [the body], as in the mannikins drawn on the walls;[142] for the parts lie around these because they come to be from them. The generation of the uniform parts is due to cold and heat; for some are composed and solidified by cold, others by heat. The differences of these have been spoken about previously elsewhere,[143] and what sorts of things are dissolvable by liquid and by fire, and what sorts are non-dissolvable by liquid and un-meltable by fire. As the nourishment oozes through the blood vessels, then, and the ducts in each of the parts, like water in unbaked pottery vessels, flesh or its analogs are composed due to the cold, which is why it is also dissolved due to fire. But of the things arising [from the blood vessels] the ones that are too earthen, because they contain too little liquid and heat, cool as the liquid evaporates along with the heat, becoming hard and earthen in shape—for example, nails, horns, hoofs, and beaks. That is why these are softenable by fire, while none is meltable by it, although some are by liquids—for example, the shells of eggs.

140. Secluding ἀεὶ καὶ.
141. 740ᵃ3–4.
142. Presumably, of Aristotle's "lecture room." See 764ᵇ20–31, *HA* 515ᵃ34–35.
143. *Mete*. 4.7–10.

Due to the internal heat, the sinews and the bones come to be as their liquidity dries. That is why in fact bones are non-dissolvable due to fire, just like pottery; for it is as if they have been baked in an oven due to the heat present in their generation. But this heat does not make any random thing to be flesh and bone, nor in any random place, nor at any random time, but rather what is natural, where it is natural, and when it is natural. For neither will what potentially is [be produced] due to what does not actively possess the capacity to move it, nor will what actively possesses it produce it from a random thing, any more than a carpenter could produce a box except from wood, nor without him will a box [be produced] from the wood.

And the heat is present in the spermatic residue and the movement and the activity it possesses are of such a quantity and sort as to be proportional to each part. But to the extent that there is any deficiency or excess to that extent what comes to be is completed in a worse way or is deformed, in much the same way as the one in which external things[144] are composed due to boiling, [for example,] to make nourishment more pleasant, or for some other work. But here it is we who establish the proportion in the heat required for the movement, while there it is the nature of the male progenitor that provides it. In the case of those that come to be spontaneously, on the other hand, the cause is movement and heat at the proper time.

Cooling is privation of heat. Nature uses both, because of necessity they have a capacity, so that they make one thing this and another thing that, but, of course, in the case of what is produced, it is for the sake of something that the one of these cools **743^{b}1** and the other heats and that each of the parts comes to be—flesh being made soft, on the one hand, of necessity, and, on the other, for the sake of something; sinew, dry and pullable; and bone, dry and shatterable.

The skin comes to be as the flesh dries just as so-called scum forms on liquids in which things are boiled. This is not only because its generation occurs at the extremity of [the body], but also because what is viscous stays at the surface, because it is not capable of evaporating. While in other animals the viscous is dry (which is why the extremities of the bloodless ones are hard-shelled or soft-shelled), in the blooded ones the viscous is more oily. And in those among the latter ones whose nature is not too earthen, what is fatty gathers under the covering of their skin, suggesting that the skin comes to be from this sort of viscous material; for what is oily is somewhat viscous. And all these, as we stated, must be said to come to be in one way of necessity, and in another way not of necessity but for the sake of something.

The upper body, then, is the first thing marked off in the course of generation, while in the blooded animals the lower gets its growth as time goes on. All the parts have their outline shapes determined earlier, and later get their colors and their degrees of softness and hardness, absolutely as if they were crafted by an animal

144. Things outside the uterus.

painter: nature; for painters too, after having traced the animal in outline shape by means of lines, just apply the colors.[145]

Because the starting-point of the perceptual modalities and of the entire animal is in the heart, the heart is the first part to come to be, and because of its heat, at the place where the blood vessels terminate above, the cold composes the brain, as a counterpart to the heat around the heart. That is why the [parts] around the head get their generation next after the heart, and surpass the others in size; for the brain is large and liquid from the start.

There is a puzzle, however, about what happens with the eyes of animals. For though at the start they appear very large in animals, whether they walk, swim, or fly, yet they are the last of the parts to be composed completely; for they shrink into line in the meantime. The cause is that, though the perceptual organ of the eyes, like the other perceptual organs too, is set on ducts, [there is the following difference]: while the perceptual organ of touch and taste is just the body or some part of the body of animals, and smell and hearing are ducts, connected to the air outside, that are full of innate breath, and terminate at the little blood vessels around the brain that extend from the heart, by contrast, the eye is the only one of the perceptual organs that has a special body of its own. It is liquid and cold and does not preexist in its place, as the other parts preexist potentially, and then become so actively later on, but instead the purest of the liquid from around the brain is secreted through the ducts that are visible leading from the eyes to the meninx[146] around the brain.

A proof of this is that, besides the brain, no other part in the head is liquid and cold except the eye, which is cold and liquid. Of necessity, then, this place gets large at first, but shrinks into line later; in fact, it also happens in the same way with the brain; for first it is liquid and large, but as evaporation and concoction proceed the brain too becomes more body-like and shrinks into line, as does the size of the eyes. But at the start, because of the brain, the head is very large, and because of the liquid in the eyeballs, the eyes appear large. They are the last to reach the end of their completion because the brain too is composed with difficulty; for it is [only] later on that its coldness and liquidity come to an end.

[And this is so] in the case of all those animals having brains, but especially in the case of the human beings. For this is why the bregma is the last of the bones to come to be; for in the case of embryos that come to be externally, this bone is still soft in the children. (The cause of this happening especially in the case of the human beings is that of the animals their brain is the most liquid and largest, and the cause of this, again, is that the heat in their heart is purest. And their thought makes clear how well blended it is; for the most practically wise of the animals is the human being.) But even children for a long time have no control of their head, which is because of the

145. A *zôgraphos* is someone who paints from life; a *zôion* is both a painting (not necessarily of an animal) and an animal (*Cat.* 1ᵃ1–6).
146. *HA* 495ᵃ8–9.

heaviness of the brain. And likewise too in the case of the parts that must move; for it is [only] later on that the starting-point of movement gets control over the upper parts, and last of all over those whose movement is not closely connected with it, like that of the limbs. And the eyelid is a part of this sort. And since nature produces nothing superfluous or pointless, it is clear that neither does it produce anything too late or too soon; for otherwise what comes to be will be either pointless or superfluous. So it is necessary for the eyelids to be separated at the same time as [the animal] is capable of moving them. It is later on, then, because of the amount of concoction required for the brain, that the eyes of animals are completed, and they last of all the parts, because the movement must be very controlling in order to move what is so far away from the starting-point and so cold. And it is clear that the eyelids have a nature of this sort; for if any degree of heaviness whatever comes about in the head, due to sleep, drunkenness, or anything else of this sort, we are also incapable of raising our eyelids, even though the weight they have is so small.

As regards the eyelids, then, it has been stated how and why they come to be, and due to what cause they are the last to get their articulation.

Each of the other parts comes to be from the nourishment: the most estimable ones and the ones participating most in the most controlling starting-point, from the nourishment that is concocted, purest, and first; the ones that are necessary and for the sake of the former ones, from the inferior nourishment, and from the leftovers and residues. For like a good household manager, nature too is not accustomed to throw anything away from which something useful can be made. In the management of households, however, the best of the available nourishment is assigned to the free males, while the inferior nourishment and the residues of the other is assigned to the household slaves, and the worst is given to the animals that are nourished along with them. Just, then, as the understanding produces from outside[147] these things for their growth, so within the things themselves that come to be the nature composes flesh and the bodies of the other perceptual organs from the purest matter, while from the residues it composes bones, sinews, and hair, and further, nails, hoofs, all things of this sort. That is why these are the last to get composed, namely, when a residue for the nature [to use] has already come to be.

The nature of the bones, then, comes to be in the first composition of the parts from the spermatic residue, and, as animals grow, they get their growth from the natural nourishment (which is precisely what the controlling parts get theirs from), but [only] from the leftovers and residues of this. For in every case a first and a second sort of nourishment comes to be, one nutritive and the other growth-productive. Nutritive is what provides the being to the whole and the parts, growth-productive is what produces increase in size. Determinations about these must be made later on.[148]

147. Reading θύραθεν. Presumably, "from outside" means from outside the human beings and animals that constitute the household.
148. Reference unclear.

The sinews are composed in the same way as the bones, and from the same things,
745a1 the spermatic residue and the nutritive. Nails, hair, hoofs, horns, beaks, the spurs of male birds, and any other part of this sort, on the other hand, are composed from the supplementary and growth-producing nourishment acquired from the female and from outside. And it is because of this that the bones get their growth [only] up to
5 a certain point; for there is a limit of size for all animals, which is why there is also one of growth of the bones. For if these always had growth, whichever animals had bone or its analog would grow as long as they lived, because bones are the defining mark of size for animals. Due to what cause they do not always get growth must be
10 stated later.[149] Hair and things of the same kind as it go on growing as long as they exist. And do so more during diseases, and when bodies are getting old and diminish, because more residues are left over, since less get used up by the controlling [parts] because of old age and diseases—although when these residues too fail due to time of
15 life, the hair also fails. The bones, however, do the contrary; for they diminish along with the body and its parts. Hair goes on growing even after death, although it does not restart to grow.

About the teeth, however, one might raise a puzzle. For they have the same nature as the bones and come to be from the bones, while the nails, the hair, the horns,
20 and things of that sort come to be from the skin, which is why they change in color along with the skin; for they become white, black, and all sorts of colors according to the color of the skin. The teeth do none of this; for they are from the bones—at any rate, in those animals that have teeth and bones. And they alone among the various
25 bones go on growing throughout life. This is clear from teeth that turn aside and do not make contact with each other.[150] The cause of their growth, as that for whose sake it is, is due to their work; for they would soon be worn down if there were not some compensating process, since even as things stand, in some aging animals that are voracious but do not have large teeth, they are altogether worn down; for their
30 destruction proceeds at a greater rate than their growth. Hence in this case too nature has contrived things well with an eye to the result; for it makes the decline of the teeth coincide with old age and death. If life lasted for ten thousand years, or even for a thousand, the teeth would have to be extremely large from the start and grow
35 anew many times; for even if they had got their growth continuously, they would
745b1 nonetheless have been worn down and been useless for their work. What their growth is for the sake of, then, has now been stated.

But it turns out that the teeth do not have the same nature as the other bones either; for they all come to be in the first composition and none of them later, while
5 the teeth come to be later. That is why in fact it is possible for them to grow again after [the previous ones] have fallen out; for though they make contact with the bones, they are not naturally united with them. Yet they come to be from the nourishment

149. Reference unclear.

150. True of the incisors of rodents and tusks of elephants, but not of all teeth.

that is distributed to the bones (which is why they have the same nature), and at a time when the latter have already attained their full complement.

The other animals are born possessing teeth or the analog of teeth, unless something contrary to nature occurs, because when they are brought forth from their progenitor they are more complete than the human being. But the human being, unless something contrary to nature happens, does not have them.

The cause due to which some teeth come to be and fall out, while others do not fall out, will be stated later.[151]

It is because parts of this sort come from a residue that the human being is the most bare-skinned of all the animals and has the smallest nails for its size; for it has the smallest quantity of earthen residue. A residue is what is unconcocted, and what is earthen is what in the bodies of all animals is least concocted.

How each of the parts is composed, then, has now been stated, as has what the cause is of their coming to be.

2.7
Nutrition of the Embryo (2); Hybrids and Sterility

In live-bearing animals the fetuses get their growth, as was said previously,[152] through the umbilical cord. For since the nutritive capacity of the soul, as well as the others, is present in animals, it immediately sends out the umbilical cord like a root to the uterus. The umbilical cord consists of blood vessels in a sheath, more numerous ones in larger animals (for example, the cow and the like), two in intermediate-sized animals, and one in the smallest ones. Through it the fetus gets its sanguineous nourishment; for the uterus is the terminus of many blood vessels.

All animals without two rows of teeth, and all those with two,[153] whose uterus does not have one great blood vessel running through it but many ones close together instead, have in their uterus the so-called cotyledons, {(the umbilical cord connects to these and is naturally attached to them; for the blood vessels, which run through the umbilical cord on this side and on that, divide up [into smaller ones] all over the uterus, and it is where they terminate that the cotyledons come to be),}[154] with their convex side toward the uterus, their concave one toward the fetus. Between the uterus and the fetus are the chorion and the membranes. As the fetus grows and becomes complete, the cotyledons become smaller, and finally disappear when it is completed. **746^{a}1** For nature prepares the sanguineous nourishment for fetuses in this part of the uterus as in breasts, and because the cotyledons are gradually gathered together from many

151. 788^{b}3–15.
152. 740^{a}24–^{b}2.
153. Ruminants.
154. These lines are absent in some mss.

into a few, the body[155] of the cotyledon becomes like an eruption or inflammation. As long as the fetus is comparatively small, incapable of taking much nourishment, they are clearly visible and large, but when it has grown, they shrink.

But most of the docked animals[156] and most of those that have two rows of teeth have no cotyledons in their uterus, but the umbilical cord extends to meet a single blood vessel that is large and extends throughout the uterus. Some of these animals are one-offspring-bearing, others many-offspring-bearing, but the several fetuses are connected to it in the same way as the one. (But one must observe these things with the help of the paradigms drawn in the *Dissections* and in the *History of Animals*.[157]) For the animals grow out from the umbilical cord, and the umbilical cord from the blood vessel, and they are next to each other along the stream of the blood vessel as along a water pipe. And around each of the fetuses are membranes and a chorion.

Those who say[158] that children are nourished in the uterus through sucking on a bit of flesh do not speak correctly; for if this were so, the same would occur in the case of the other animals, but as things stand it manifestly is not (in fact this will easily be seen in dissections). Also, all fetuses alike, whether of animals that fly, swim, or walk, have thin membranes that encompass them, separating them from the uterus and from the liquids that arise in it, and neither in these membranes themselves is there anything of the relevant [nourishing] sort, nor is it possible that anything of advantage will be gotten through them. As for those laid as eggs, it is evident that all of them get their growth on the outside, when separated from the matrix.

Copulation in accord with nature occurs between animals of the same kind, nonetheless it also occurs between those that have a close nature, although not undifferentiated in form, if their size is much the same and if the times of their pregnancy are equal. Although, in the case of other animals, such occurrences are rare, it does occur in the case of the dogs, the foxes, and the wolves.[159] And Indian hounds[160] are born from some wild dog-like animal and a dog. And in the case of the birds that mate
746[b]1 frequently it has been seen to occur—for example, in the case of the partridges and the hens. And among the crook-taloned birds, the hawks that differ in form seem to have sexual intercourse with each other, and it is the same way in the case of certain other birds as well. In the case of the sea animals nothing worth mentioning has been seen; but the ones called *rhinobatos*[161] especially does seem to come to be from the copulation of the angelfish (*rhinê*) and the ray (*batus*). And it is said that the proverb

155. The "caruncle" or "swelling" in the wall of the uterus in which the cotyledon is located. It is unclear what "gathered together" refers to.
156. Here, apparently, the hornless ones.
157. The reference is probably to *HA* 7.8, which presumably included diagrams.
158. E.g., Democritus, Hippocratics.
159. Rejecting the addition of καὶ θώων.
160. *HA* 607[a]3–4.
161. *HA* 566[a]26–30.

about Libya suggesting that "Libya is always nourishing something new"[162] is because there animals not of the same family have sexual intercourse with each other; for it is said that because of the scarcity of water they all meet at the few places with springs and have sexual intercourse, even those that are not of the same sort.

Among the animals that come to be from this sort of sexual intercourse all are seen to copulate again with each other and are capable of generating both a female and a male, while the mules alone among the animals of this sort are infertile; for they do not generate either through sexual intercourse with each other or with other animals. There is, however, a universal problem as to what the cause is due to which a male or a female is infertile; for there are both women and men who are infertile, and in the case of the other animals there are some in each kind—for example, the horses and the sheep. But in this case, the case of the mules, the whole kind is infertile. In the case of the others, the causes of their infertility are several; for both women and men are infertile from birth when the places used for sexual intercourse are deformed, so that the former do not have pubic hair and the latter do not grow a beard but remain like eunuchs. But others, as they advance in age, are affected in the same way, sometimes because of their well-nourished bodies (for in women who are too fat and in men who are in too good condition, the spermatic residue is used up by the body, and in the former menses do not occur or in the latter semen), and sometimes, because of disease, men emit semen that is cold and liquid, while the purgations [of menses] by the women are bad and full of diseased residues.

But in the case of many men and many women, this affection occurs because of deformations in the parts and the places useful for sexual intercourse. Some of these are curable, some incurable, but those especially remain infertile if things of this sort have come about in the first composition;[163] for then mannish women and womanish men come to be, and in the former menses do not occur, while in the latter the seed is fine-grained and cold. That is why the [semen] of males is reasonably tested for infertility by trials in water; for what is fine-grained and cold quickly disperses on the surface, while what is fertile sinks to the bottom; for what is concocted is hot, and what is composed and coarse-grained has been concocted. They test women, on the other hand, by means of pessaries,[164] to see whether its odors penetrate upward from below to the exhaled breath, and by colors rubbed on the eyes to see whether they color the sputum in the mouth. For if these things do not result, it makes it clear that, in the body, the ducts through which the residue is secreted are commingled and grown together. (For the place around the eyes, of all those around the head, is the most spermatic. This is made clear by the fact that during acts of sexual intercourse it alone changes its configuration in an obvious way, and that those who indulge too much in sexual intercourse have manifestly sunken eyes.[165] The cause is that the

162. *HA* 606ᵇ19–20.
163. I.e., the one from the spermatic residue (744ᵇ27, 745ᵇ4).
164. These were scented with various fragrant herbs.
165. †*Pr.* 876ᵃ36–ᵇ17.

nature of the semen is similar to that of the brain; for the matter of it is watery, and the heat acquired.) Also, the spermatic purgations are from the diaphragm; for the starting-point of the nature is there, so that the movements from the sexual parts penetrate to the thorax,[166] and all the odors from the thorax become perceptible via the breathing.

2.8
Mules

In the human beings, then, and in the other kinds, as was said previously,[167] this sort of deformation occurs in particular individuals, but in the case of the mules, the whole kind is infertile. About its cause, Empedocles and Democritus speak (the first not in a perspicuous way, Democritus in a better known one), but they did not speak correctly. For they state their demonstration alike in the case of all the animals that copulate contrary to sameness of kind.

For Democritus says that the ducts of mules are destroyed in the uterus because the animals do from the start come to be from those that are not of the same kind. This latter happens in the case of other animals and they generate nonetheless—and yet it is necessary, if indeed this were the cause of their infertility, for all the others that have sexual intercourse in this way to be infertile too.

Empedocles, on the other hand, makes the cause be the mixture of the seeds becoming coarse-grained as a result of the semen of each being soft (for the hollows of one fit into the coarse-grains of the other, just like bronze mixed with tin)—not even stating the cause correctly in the case of bronze and tin (they are spoken about in the *Problems*[168]), nor, in general, producing his starting-points from known things. For how do the hollows and the coarse-grains fit together to produce the mixture, for example, of wine and water? For this saying is beyond us; for the way we are to understand the hollows of wine and of water is too far contrary to perception.

Further, since in fact it happens that from horses a horse comes to be, from asses an ass, and from a horse and an ass a mule does so, and in two ways, depending on whichever of the two is male or female, why is it that from these something so coarse-grained is produced that what comes to be [from it] is infertile, while from a female and male horse or a female and male ass what comes to be is not infertile? And yet, though the seed of both the male horse and the female one is soft, both a female horse and a male ass and a male horse and a female ass have sexual intercourse, and that is why what comes to be from both is infertile, he says: because from the two one thing comes to be that is coarse-grained, because the seeds are soft. But so it should also be, then, when it comes to be from a male and female horse. For if only one of the

166. *HA* 491a29–30.
167. 746b12–747a2.
168. There is nothing about this in the extant †*Pr*.

two had sexual intercourse, it would be open to say that one of the two's not being a match for the semen of the ass was the cause of its not generating. But as things stand, whatever sort it is in that intercourse, it is this same sort too in intercourse with an animal of the same kind.

Further, the demonstration is stated alike for both the female and the male mule—the male alone does generate (and does so at the age of seven years), so it is said; the female, on the other hand, is wholly infertile, and even she is so [only] because she does not nourish [the embryo] to the end, since cases have been observed of a female mule that contained an embryo.

But perhaps a logico-linguistic demonstration might seem more persuasive than the ones stated—I call it "logico-linguistic" because, in being more universal, it is further away from the proper starting-points. It is something like this: Suppose that from a male and a female of the same form a male or a female naturally comes to be that is of the same form as its progenitors (for example, from a male and a female dog a male or a female dog), while from a pair distinct in form, one distinct from them in form comes to be (for example, if a dog is distinct in form from a lion, from a male dog and a female lion one distinct from them in form also comes to be, and from a male lion and a female dog too). So, since a male and a female mule come to be and are not different in form from each other, and a mule comes to be from a horse and an ass, and these are distinct in form from mules, it is impossible for anything to come to be from mules; for something of a distinct kind cannot come to be, because what comes to be from a male and female of the same form is the same in form as they, and a mule cannot, because it comes to be from a horse and an ass, which are distinct in form, and it was accepted that from animals distinct in form a distinct [form of] animal comes to be.

But, in fact, this argument is too universal and empty; for arguments that are not from the proper starting-points are empty: they seem to be based on the things at issue, but are not really. For [arguments] from geometrical starting-points are geometrical ones, and likewise in the other cases. But what is empty, though it seems to be something, is nothing. And it is not true; because many animals that come to be from ones not of the same form are fertile, as was said previously.[169] One should not, then, inquire in this way either concerning other things or concerning natural ones.

Rather it is from getting a theoretical grasp on what belongs to the horse kind and the ass kind that one should get the cause. In the first place, each of them is one-offspring-bearing from animals of its own kind; next, the females are not always able to conceive from the males (which is why breeders mate horses again at intervals), because they are not continuously capable of bearing.[170] On the contrary, the mare is not [abundantly] menstruous, but among the four-footed animals emits the least.[171]

169. $746^{a}29$–$^{b}11$, $747^{a}31$–33.

170. Reading διὰ τὸ μὴ δύνασθαι συνεχῶς φέρειν.

171. In proportion to size (*HA* $573^{a}11$).

And the female ass is not receptive of mating, but expels the seed with her urine, which is why people follow behind flogging her.[172] Further, the ass is a cold animal, which is why—because its nature is sensitive to cold—it does not readily occur in cold climates, such as Scythia and the bordering region, or among the Celts beyond Iberia; for it is also a cold region. And it is due to this cause that they do not put the jackasses to the females at the equinox, as is done with horses, but around the summer solstice, in order that the foals may be born in a warm season; for the season they are born in is the same as the one in which mating occurs; for both the horse and the ass are pregnant for a year. And because, as was just said, its nature is cold, it is necessary for the semen of an animal of this sort to be cold as well. A sign of this is that, because of it, if a horse mounts a mare that has already mated with an ass, he does not destroy the result of the ass's mating, but if the ass mounts second, he does destroy that of the horse, due to the coldness of his own seed. When, then, they have sexual intercourse with each other the result is preserved by the heat of one of the two of them; for what is secreted by the horse is hotter; for both the matter and the semen of the mule are cold, while those of the horse are hotter. And when hot is mixed with cold or cold with hot, the result is that the embryo that comes to be from them is preserved and they are fertile from each other, while what comes to be from them is no longer fertile, but is infertile as regards generating complete offspring.

In general, each of the two is naturally well-disposed to infertility, for the other things mentioned[173] belong to the ass, and in addition if it does not begin to generate after the first shedding of teeth,[174] it no longer generates at all, so close does the body of the ass come to being infertile. It is the same way with the horse; for it is naturally well-disposed to infertility, and all that remains to make it infertile is for [the semen] from it to become colder. And this comes about when it is mixed with the secretion of the ass. And in the same way the ass, should it copulate with its own, comes equally close to generating something infertile, so that when in addition copulation occurs contrary to nature (if at the same time asses are capable only with difficulty of generating a single offspring from each other), what comes to be from the pair, being yet more infertile and contrary to nature, will need nothing [else] to make it infertile, but will of necessity be infertile.

It results too that the bodies of the female mules become large in size, because the secretion that goes to the menses is diverted to growth. And since the pregnancy in animals of this sort lasts a year, the female mule must not only conceive but also nourish [the embryo], and this is impossible if menses do not occur. But in the female mules none occur, instead, the useless part [of the nourishment] is excreted with the residue that comes from the bladder (which is why the male mules do not even smell at the sexual parts of the female as the other solid-hoofed animals do), while the other

172. *HA* 577a21–24.
173. Paucity of menses, expulsion of semen with urine, and a cold nature.
174. At thirty months (*HA* 577a18).

parts are diverted to the growth of the body and to size. So, while it is sometimes possible for the female to conceive (which is precisely what it appears has already happened), for her to nourish [the embryo] to the end and bring to birth is impossible.

The male, for his part, may sometimes generate, both because the male is hotter by nature than the female and because the male contributes no body at all to the mixture. And the complete thing that comes to be is a ginnus,[175] which is a deformed mule; for the ginni also come to be from the horse and the ass when the embryo gets diseased in the uterus. For the ginnus is like the runts in pigs; for there too what is deformed in the uterus is called a "runt" and any random piglet may come to be of this sort. And human dwarfs come to be in a similar way; for they are deformed, both in their parts and their development, during pregnancy, and are like runts and ginni.

BOOK 3

3.1
The Birds (1): Wind-Eggs; the White and the Yellow

The sterility of mules has now been spoken about as have the animals that are live-bearing both externally and internally. In the egg-laying blooded ones, things having to do with generation proceed in much the same way as those in animals that walk and one must grasp the same thing about them all, although in another way they exhibit differences both in relation to each other and in relation to the animals that walk.

All of them alike, then, come to be from copulation and the emission of male semen into the female. But among the egg-laying ones, the birds emit a complete hard-skinned egg, unless it is deformed by disease, and the eggs of birds are all two-colored. The selachian fishes, as has often been said, after being internally egg-laying, are live-bearing, the egg changing previously from one place in the uterus to another, and their egg is soft-skinned and single-colored. One alone of these is not internally egg-laying, the one called the "fishing frog."[176] The cause of this will be spoken about later.[177] All the other fishes that are egg-laying emit an egg of one color only, but it is incomplete; for it gets its growth outside due to the same cause that the eggs completed inside also do.

Their uteruses, the differences they exhibit, and due to what causes, have been spoken about previously.[178] For in fact some of the egg-laying ones have the uterus high up near the diaphragm, while others have it low down near the sexual parts.

175. The offspring of a mule and a mare (*HA* $577^{b}21$).
176. *HA* $487^{a}27$.
177. $754^{a}25$–31.
178. 1.3.

The selachian fishes have it high up; the ones that are both internally and externally live-bearing (for example, the human being, the horse, and each of the others of this sort) have it low down; and, among the egg-laying ones, it is sometimes low down (as in the egg-laying fishes), sometimes high up (as in the birds).

Fetuses also get composed in birds spontaneously, the ones some people call "wind-eggs" and *zephuria*.[179] These come to be in the ones that are neither flyers nor crook-taloned, but prolific, due to the large quantity of residue these have (in the crook-taloned ones, on the other hand, this sort of secretion is diverted to the wings and wing-feathers, and they have a small body that is dry and hot), and menstrual secretion and semen are residues. Since then both the nature of the wings and that of the seed come to be from residues, nature is incapable of yielding much for both. And it is due to this same cause that the crook-taloned birds neither mate frequently nor are prolific, while the heavy birds and the flyers that have bulky bodies are prolific, like the common pigeon and those of this sort. For in those birds that are heavy and are non-flyers—for example, the chickens, the partridges, and the others of this sort—much residue of the relevant sort comes to be. And this is why their males mate frequently and their females emit much matter, and some of this sort lay many eggs, while others do so often—for example, the chicken, the partridge, and the Libyan ostrich[180] lay many, while the pigeon family lay not many but often; for these are intermediate between the crook-taloned birds and the heavy ones; for they are flyers like the crook-taloned ones, and have magnitude of body like the heavy ones. So, because they are flyers and the residue is diverted to there, they lay few eggs, but because of the size of their bodies and because of the heat their stomach possesses and its very great capacity for concoction, and in addition because they easily get nourishment, while the crook-taloned ones do so with difficulty, they lay them often.

The small birds too mate frequently and are prolific, just as sometimes the small plants are; for what is for the growth of their body becomes spermatic residue. That is why the Adriatic chickens[181] lay the most eggs. For because of the smallness of their body the nourishment is used up for procreation. Also, the ones not true to their stock lay more eggs than those true to their stock; for their bodies are more liquid and more bulky, while those of the latter sort are leaner and drier; for the spirit that is true to its stock comes about more [often] in bodies of this sort. Further, the thinness and weakness of the legs contribute to the nature of this sort of bird being to mate frequently and be prolific, just as in the case of the human beings; for in animals of this sort the nourishment for the legs is diverted to the spermatic residue; for what nature subtracts from one place, it adds at another. The crook-taloned birds, on the other hand, have a strong foot and their legs are thick due to their [way of] life, so that, due to all these causes, they neither mate frequently nor are prolific. The

179. Wind-eggs produced in spring (*HA* 560ª6).
180. *PA* 4.14.
181. *HA* 558ᵇ16–17.

kestrel, however, is the most prolific; for pretty much alone among the crook-taloned birds it drinks, and the liquid, both innate and taken in, is productive of seed when combined with the heat that is present in the kestrel. But it does not lay very many eggs either, but rather four at the most.

The cuckoo, though not a crook-taloned bird, lays few eggs, because its nature is cold (as the cowardice of the bird makes clear), while a spermatic animal must be hot and liquid. That it is cowardly is evident; for it is chased away by all birds and lays its eggs in the nests of others.

Birds of the pigeon family are generally in the habit of laying two eggs. For they neither lay one egg (for no bird lays one egg except the cuckoo, and it sometimes lays two) nor many eggs, but often lay two or at the most three, generally two; for these numbers are intermediate between one and many.

That the nourishment in those that lay many eggs is diverted to the seed is evident from the facts. For most trees, if they bear too much fruit, dry up after the crop, when nourishment is not left over for their bodies, and this is how the annuals seem to be affected—for example, the legumes, wheat, and the others of this sort; for they use up all the nourishment for seed; for they are of the abundant-seed kind. And some chickens, after having laid very many eggs, even laying two eggs in a day, have died after the laying of so many. For they become exhausted, and this applies to both the plants and the birds; and this affection is an excess excretion of residue. And an affection of this sort is also the cause of the later infertility of the lioness; for at first she gives birth to five or six cubs, then in the next year four, and again three, then the next number down to one, then none at all, suggesting that the residue is being used up and that at the same time as the seed is withering the life is abating.

In which birds wind-eggs occur, further, what sorts lay many eggs and what sorts **750^{b}1** few eggs, and due to what causes, has now been stated.

Wind-eggs occur, as was also said previously,[182] because, while the spermatic matter is present in the female, in the birds the secretion of menses does not occur, as it does in the blooded live-bearing ones; for in all those of the latter sort it does occur, more in some, less in others, and in some just enough to show signs of it. Similarly, it does not occur in the fishes either, any more than in the birds; which is why in the fishes as well [as in the birds], without mating, a composition of embryos occurs, although less noticeably; for their nature is colder. The secretion corresponding to the menses in the egg-laying animals occurs in the birds at the times appropriate for the residue, and as the place near the diaphragm is hot, the [eggs] are completed in respect of size, but both these bird ones and those of the fishes alike are, without the semen of the male, incomplete for purposes of generation. The cause of these things was stated previously.[183]

182. 741^{a}16–32, 749^{a}34–^{b}3.
183. 2.5.

Wind-eggs do not occur, however, in the birds that are flyers, due to the very same cause as the one due to which they do not lay many eggs either; for in the crook-taloned birds the residue is small in amount, and they need the male to provide the impulse for the excretion of the residue. The wind-eggs occur in greater numbers than the fertilized eggs, but are smaller in size, due to one and the same cause; for because they are incomplete, they are smaller in size, and because they are smaller in size, they are greater in number. They are less pleasant to eat because they are more unconcocted; for in all cases what is concocted is sweeter.

That, then, neither the eggs of the birds nor those of the fishes are complete for purposes of generation without the male has been sufficiently observed, but as regards embryos that come to be without males in the fishes, it has not been observed to a similar extent, but has been observed most in the case of the river fishes; for some manifestly have eggs from the outset, as is recorded about them in the *History of Animals*.[184] Generally speaking, at any rate, in the birds, even the eggs that come to be through mating are, for the most part, not naturally disposed to get growth if the hen is not mated continually. The cause of this is that just as in the case of women, having sex with men draws down the womanly secretion (for when the uterus has been heated it draws the liquid and the ducts are opened up), so this also happens in the case of the birds, advancing the menses-like residue a little at a time. It is not secreted externally because of the smallness of amount and because the uterus is high up near the diaphragm, but trickles down and collects in the uterus itself. For this will make the egg grow—just as the embryos of the live-bearing animals are made to grow through the umbilical cord—through flowing on the inner surface of the uterus, since, when the hens have been mated once, they pretty much all continue to have eggs, though altogether small ones.

That is why some people are in the habit of speaking of wind-eggs as not occurring [without the male] either, but as being leftovers from previous matings. But this is false; for it has been sufficiently observed both in the case of newborn chicks and geese that wind-eggs occur without mating. Further, female partridges, both those that are unmated and those that have been mated, when taken out to act as decoys, smell the male and hear his call, the first lot become full of eggs, while the second lay them at once. The cause of the affection is precisely the same as the one in the case of the human beings and the four-footed animals; for if their bodies happen to be in heat for sexual intercourse, some emit seed at the sight [of a female], others at the occurrence of a slight touch. The nature of the birds of this sort is to mate frequently and have abundant seed, so that the movement they need is small when they happen to be in heat, and the excretion takes place quickly in them, so that wind-eggs are composed in the unmated ones, while in those that have been mated the eggs grow and are completed quickly.

184. 567ᵃ30–31.

Among the externally egg-laying animals, the birds emit an egg that is complete, the fishes one that is incomplete, but that gets its growth outside [the mother], as was also said previously.[185] The cause of this is that the fish kind is prolific. But it is impossible for a large number of eggs to reach completion inside [the mother], which is why they are laid outside. Their emission is quickly effected; for in the externally egg-laying fishes the uterus is near the sexual parts.

While the eggs of the birds are two-colored, those of all the fishes are single-colored. One may observe the cause of their being two-colored from the capacities of each of their parts, that of the white and of the yellow. For the secretion comes to be from the blood (for no bloodless animal lays eggs), and that blood is the matter for bodies has often been stated.[186] The one part, then, is nearer the shape of what is coming to be, namely, the hot; the more earthen part, by contrast, supplies consistency for its body and is further away [from the shape]. That is why in all two-colored eggs the animal gets the starting-point of generation from the white (for the soul-involving starting-point is in the hot), but its nourishment from the yellow. In animals with a hotter nature the part from which the starting-point comes to be is set apart and separate from the one from which nourishment derives, the first being white, the second yellow, and there is always more of the white and pure than of the yellow and earthen.

But in those that are less hot and more liquid, the yellow is more and more liquid. That is precisely what occurs in the case of the marsh birds; for their nature is more liquid and colder than the land birds, so that the eggs of this sort of bird have more of what is called "lecithus" and are less yellow, because the white is less set apart from it. And the egg-laying animals, whose nature is both already cold and yet more liquid (and the fish kind is of this sort), have the white not set apart at all, both because of the smallness [of the eggs] and because of the quantity of cold and earthen material. (That is why all the fishes' eggs are single-colored, and are white as compared with yellow, yellow as compared with white.) Even the wind-eggs of the birds have this double coloring; for they contain that from which will come each of the two parts (both the one from which the starting-point comes and the one from which the nourishment does), although these are incomplete and have need of the male in addition; for wind-eggs become fertile if [the female] is mated with the male within a certain period of time. The cause of the double coloring, however, is not the male and the female (as if the white came from the male and the yellow from the female)—on the contrary, both come from the female, but the latter is cold and the former hot. In those cases, then, in which there is much of the hot, it is set apart, but when there is little, it cannot be. That is why the embryos of animals of this sort are single-colored, as was said.[187]

185. $749^{a}25–27$.
186. E.g., $740^{b}34–35$.
187. $751^{b}10–20$.

The semen alone composes them. And that is why an embryo in the birds first appears white and small, but all yellow as it advances, and more bloodlike material is continually mixed with it. In the end, as the hot is set apart, the white takes up a position all around it, equally distributed on all sides, as when a liquid boils [some-
752a1 thing]; for the white is by nature liquid and has within itself the soul-involving heat. That is why it is set apart all around, while the yellow and earthen part is inside. And if one pours together many eggs into a bladder or something of that sort and boils
5 them by means of a fire that does not make the movement of the heat faster than the disaggregation within the eggs, then just as in one egg, so too in the whole composed of all the eggs, the yellow comes to be in the middle, the white around it.

Why some eggs are single-colored, then, while others are two-colored, has now been stated.

3.2
The Birds (2): Shape of Eggs; Growth of Eggs; Brooding; Umbilical Cords

10 The starting-point coming from the male is set apart in eggs at the place where the egg is attached to the uterus, and a two-colored egg then becomes non-symmetrical, that is, not altogether round, but rather sharper at one of the two ends, because it is necessary to make the white, in which the starting-point resides, different [from the rest]. That is why the egg is harder at that point than below; for it is necessary to
15 shelter and safeguard the starting-point. And because of this the sharp end of the egg emerges later; for the part attached [to the uterus] emerges later, the egg is attached at the starting-point, and the starting-point is in the sharp end. It is the same way too in the seeds of plants; for the starting-point of the seed is attached in some cases to
20 the branch, in some to the husk, and in others to the seedcase. This is clear in the case of the leguminous plants; for the point at which the two valves of beans and seeds of this sort make contact is where the seed is attached; and the starting-point of the seed is there.[188]

Someone might raise a puzzle, however, about the growth of the egg, as to what way it comes about from the uterus. For if animals get their nourishment through
25 the umbilical cord, what do eggs get it through—since they do not, like larvae, get their growth through themselves? And if there is something through which they are attached [to the uterus], where does it go when the egg has reached completion? For it does not emerge with the egg, as the umbilical cord does in the case of animals;
30 for when it has reached completion, its surface envelope becomes a shell. The puzzle stated, then, is correctly inquired about. But [the one who raises it] fails to consider the fact that when the shell first comes to be it is a soft membrane, while, when it has reached completion, it becomes hard and brittle, but in such a measured way

188. *Juv.* 468b18–23.

that when it emerges it is still soft (for otherwise laying the egg would cause pain), though when it has emerged, it immediately solidifies when it has cooled, the liquid evaporating quickly because there is very little of it, leaving the earthen material behind. Part of this membrane, then, is at the start like an umbilical cord at the sharp **752ᵇ1** end, and projects, while the egg is still small, like a pipe. It is visible in small aborted eggs; for if, being wet through or chilled in some other way, the bird ejects the egg [too soon], the embryo appears still bloody and with a small tail running through it like an umbilical cord. As the egg becomes larger, this becomes more twisted around and becomes smaller. And when the egg has reached completion, the sharp end of the egg [is where] this comes to its limit. Underneath this is the inner membrane which divides the white and the yellow from it. When the egg has reached completion, the whole egg is released and the umbilical cord is reasonably not visible; for it is the last extremity of the egg itself.

Delivery, however, occurs in a contrary way with eggs than with the offspring of live-bearing animals; for, with the latter, it is head and starting-point down, while with an egg the delivery is, as it were, feet down. And the cause of this is the one that was stated,[189] that the egg is fastened at the starting-point.

Generation from an egg comes about in the birds due to the mother bird's brooding and helping the concoction, with the animal being set apart from a part of the egg, while it gets its growth and completion from the remaining part; for nature puts in the egg both the matter for the animal and sufficient nourishment for its growth; for, since the mother bird is not capable of completing the egg within herself, she composes the nourishment in the egg along with it. For while in the case of the live-bearing animals the nourishment (which is called "milk") occurs in a different part (the breasts), in the case of the birds, nature produces it within the eggs—in the contrary way, however, to the one people think and Alcmaeon of Croton states. For it is not the white that is the milk but rather the yellow; for this is the nourishment for the newborn chicks, while they think it is the white because of the similarity of color.

The newborn chick, then, as was said,[190] comes to be due to the mother bird's brooding. But if the season is well blended[191] or if the place in which they are situated is sunny, the eggs get completely concocted, both those of the birds and those of the egg-laying four-footed animals—for all of the latter lay their eggs on the ground, where they get concocted with the help of the heat of the earth, and whichever of the egg-laying four-footed animals visit their eggs and brood on them do so more for the sake of safeguarding them.

Both the eggs of the birds and those of the four-footed animals turn out the same way; for they are both hard-skinned and two-colored, and are composed near the **753ᵃ1** diaphragm just like those of the birds, and all the other things occur in the same

189. 752ᵃ10–18.
190. 752ᵇ15–17.
191. I.e., temperate.

ways both internally and externally, so that the theoretical knowledge of the causes is the same for all of them. But while the eggs of the four-footed animals, because of their strength, get completely concocted due to the season, those of the birds are more vulnerable and need the mother. It seems that nature too tends to establish [in animals] a perception-based capacity for taking care of the young. In the inferior animals this capacity implanted by nature lasts till the latter's birth; in others till their complete development too; and in those that are more practically wise even till they are brought up. In those, then, that have the greatest share in practical wisdom, there is intimacy and love toward them even after they have completely developed, as in the case of the human beings and some of the four-footed animals. But in the birds the capacity lasts until they have borne the chicks and brought them up. That is why females that do not brood when they have laid the eggs get into worse condition, as if they have been deprived of things that are naturally a part of them.

The animal reaches completion more quickly within the egg during sunny days; for the season contributes to the work; for concoction too is [a sort] of heat. And, indeed, the earth helps concoct them with its heat, and the brooding female does this same thing; for she infuses [into them] the heat that is within herself. And the eggs get ruined and become so-called *ouria* more often in the hot season—and reasonably so; for just as wines sour during sunny periods because the sediment gets stirred up (for this is the cause of their being ruined), in the eggs the yolk does. For what gets stirred up is the earthen material in both of them—which is also why wine becomes turbid when the sediment mixes with it, and the eggs become ruined when the yolk does so [with the white].

In the case, then, of the birds that lay many eggs this sort of thing occurs reasonably (for it is not easy to assign the fitting amount of heat to all, but some will get too little and others too much, making them turbid and, as it were, putrefying). But in the crook-taloned birds, though they lay few eggs, this occurs to no less an extent; for often in fact one of a pair becomes rotten, and the third (one might almost say) always does; for their nature being hot they make the liquid in the eggs to boil over, as it were. For of course the yellow and the white are of a contrary nature too. For the
753b1 yellow gets coarse-grained in frosts but liquifies when heated. That is why, when concocted in the earth or due to brooding, it liquifies, and when it is of this sort, it becomes nourishment for the animals being composed. When exposed to fire and baked, it does not become hard, because its nature is to be earthen in the way wax is. And because of this, when [the eggs] are heated more,[192] they turn serous and become rotten. The white, on the other hand, does not become coarse-grained due to frosts, but liquifies (the cause has been stated previously), while when exposed to fire it becomes solid. That is why, in fact, when it is concocted in connection with the generation of animals it becomes coarse-grained. For it is from this that the animal is composed, while the yellow becomes nourishment, and the parts, as they are serially

192. Omitting ἐὰν ᾖ μὴ ἐξ ὑγροῦ περιττώματος.

composed, get their growth from there. That is why too the yellow and the white are distinct and kept separate by membranes, as each having a distinct nature.

The exact way these parts stand to each other, both at the start of generation and during the composition of the animal, and further as regards the membranes and umbilical cords, one must observe with the help of what is written in the *History of Animals*.[193] But for the present investigation it is enough for this much to be evident, that when the heart has been first composed and the great blood vessel has been marked off from it, two umbilical cords extend from this blood vessel, one to the membrane that encompasses the yellow, the other to the chorion-like membrane that encompasses the animal like a circle, and thus it goes around the membrane of the shell. Through one of the two cords the embryo gets the nourishment from the yellow, while the yellow becomes larger; for it becomes more liquid when it is heated. For the nourishment, which is corporeal, needs to be liquid, just as it does for plants, and both the things that come to be in eggs and those that do so in animals at first live a plant's life; for they get their first growth and nourishment from something by growing from it.

The other umbilical cord extends to the encompassing chorion. For in the case of the animals born from eggs, we must suppose them to stand in the same relation to the yellow as the live-born embryo does to the mother, when they are within the mother (for since the ones born from eggs are not being nourished in the mother, they take some part of it[194]), while its relation to the outermost membrane—the one that is bloody—is like that of the live-born one to the uterus. At the same time, the egg shell of the egg that grows around both the yellow and the chorion is the analog of the uterus, as if one were to put one around both the [live-born] embryo itself and around the whole mother. It is this way because the embryo must be in the uterus, that is, in contact with the mother. In the live-bearing animals, in fact, the uterus is within the mother, but in the egg-laying ones it is the reverse, as if one were to say that the mother is within the uterus; for what comes to be from the mother—the nourishment—is the yellow. And the cause is that the nourishing is not within the mother.

In the process of growing, the umbilical cord going to the chorion collapses first, because it is where the animal is to emerge, while the rest of the yellow and the umbilical cord going to the yellow do so later; for what has come to be must have nourishment from the outset; for it is neither nursed by its mother nor capable from the outset of providing nourishment by itself. That is why the yellow goes inside it along with the umbilical cord and the flesh grows around it.

The ones, then, that come to be outside from complete eggs come to be in this way both in the case of the birds and in that of the four-footed animals that lay a

193. *HA* 6.3.
194. The yolk.

hard-skinned egg. These things are clearer in the larger animals; for in the smaller ones they are non-apparent because of how small their dimensions are.

3.3
The Fishes (1): The Selachians

Further, the fish kind is egg-laying. Among these, the ones that have the uterus low down lay an incomplete egg, due to the cause stated previously, while the so-called selachian fishes lay a complete egg internally, though they are externally live-bearing, with one exception, the so-called fishing frog, which alone lays a complete egg externally. The cause of this is the nature of its body; for its head is many times as large as the rest of its body and is spiny and very rough. That is why it neither takes its young in again afterward nor is live-bearing from the start;[195] for just as the size and roughness of the head prevents their coming in, in the same way it prevents their emerging. But since the egg of the selachians is soft-skinned (for they are incapable of hardening and drying its surface envelope; for they are colder than the birds are), only the egg of the fishing frog is solid and firm so as to be preserved outside, while those of the others are wet and soft in nature; for they are sheltered within and by the body of the mother.

754b1 The process of generation from the egg both for the fishing frogs, which are completed externally, and for the ones completed inside is the same, and in these it is partly similar to and partly different from the ones in the birds. For first they do not have the other umbilical cord which extends to the chorion that is under the encompassing shell. The cause of this is that they do not have the surrounding shell; for it is of no use to them (for the mother shelters them), while a shell is a defense against external harms for eggs that are laid outside. Second, the process of generation is from the extremity of the egg in these as well, but not [as in the birds] at the place where it is attached to the uterus; for birds come to be from the sharp end, and this is where the egg was attached. The cause is that the egg of the birds is separated from the uterus, while the egg, not of all but of most of these sorts of fishes, stays attached to the uterus when complete. And when the young animal comes to be at the extremity, the egg gets used up, just as in the case of the birds and the others that are detached [from the uterus], and in the end the umbilical cord remains attached to the uterus of those that are by this time complete. It is likewise too with those selachians whose eggs get detached from the uterus; for in some of them the egg is detached when it has become complete.

One might raise a puzzle, then, as to why the process of generation in the birds and in fishes differs in this respect. The cause is that in the eggs of the birds the white and the yellow are separate, while those of the fishes are single-colored, and what is of

195. *HA* 565b23–31.

this sort is mixed together throughout, so that there is nothing to prevent them from having the starting-point be from the contrary end; for it is not only at the point of attachment that it is of this mixed sort, but also at the opposite one, and it is easier to draw the nourishment from the uterus by means of certain ducts coming from this starting-point. This is clear in the case of the eggs that are not detached; for in some of the selachians the egg is not detached from the uterus, but rather stays connected as it is displaced downward for purposes of live-bearing; in these cases, when the animal is completed it retains the umbilical cord coming from the uterus after the egg has been consumed. It is evident, then, that previously too, while the egg was still around it, the ducts extended to the uterus. This occurs, as we have said, in the smooth sharks.[196]

The process of generation in the birds differs in these respects from that of the fishes, then, and does so due to the causes just stated. But in the other respects it occurs in the same way; for they have the other umbilical cord in the same way, as the birds have it going to the yellow, so the fishes have it going to the whole egg (for it is not the case that part of it is white and part yellow but rather it is all single-colored), and they get their nourishment from it, and as it gets used up the flesh likewise comes and grows around it.

3.4
The Fishes (2): Non-selachians

As regards the fishes that lay a complete egg within themselves but are externally egg-laying, then, this is the way their process of generation proceeds. Most of the other fishes, by contrast, are externally egg-laying, with all except the fishing frog laying an incomplete egg—the cause of this was stated earlier.[197] And of the others' laying incomplete eggs the cause has also been stated.[198]

In the case of these too the process of generation from an egg proceeds in the same way as the one in the case of the internally egg-laying selachians, except that their growth is quick, from small things, and the extremity of the egg is harder. The growth of the egg is similar to that of larvae; for those animals that give birth to larvae also give birth to something small at first, which grows due to itself and not due to any attachment at all. The cause of this is much the same as the one in the case of yeast; for yeast too from being small becomes large as the more solid part liquifies while the liquid part becomes pneumaticized. What crafts this in living things is the nature of the soul-involving heat, and within yeast is the heat of the humor blended with it. The eggs, then, though they grow of necessity due to this cause (for they contain a yeast-like residue), also do so for the sake of the better; for it is impossible for them

196. *HA* $565^{b}2$–17.
197. $754^{a}26$–31.
198. $718^{b}5$–15.

to get the whole of their growth in the uterus because these animals lay so many eggs. It is because of this indeed that they are altogether small when they are secreted and get their growth quickly: small—because of the narrowness of the uterus in relation to the quantity of eggs; quickly growing—in order that their kind not be destroyed because of spending a lot of time during the process of generation on growth, since even as things stand most of the embryos that are laid externally are destroyed. That is why the fish kind is prolific; for nature fights back against destruction by the quantity. And there are some fishes—for example, the one called *belonê*[199]—that burst because of the size of their eggs; for the embryos it holds are large instead of many; for what nature subtracts from quantity it adds to size.

That there is growth of these sorts of eggs, then, and also what cause it is due to, has now been stated.

3.5
The Fishes (3): Erroneous Theories of Mating

A sign that these fishes too are egg-laying is that even the live-bearing fishes, such as the selachians, are first internally egg-laying; for [then] it is clear that the whole fish kind is egg-laying. However, none of these sorts of eggs reaches completion—where there is a female and a male and they come to be from mating—unless the male sprinkles his seminal fluid on them.

There are some who say that all fishes are females except selachian ones, but this is not correctly stated; for they think that the females differ from the ones considered to be males in the same way as in those plants where the one bears fruit and the other is barren—for example, olive, oleaster, fig, caprifig. It is likewise too, they think, with the fishes, except the selachian ones—for they do not dispute the issue in their case. And yet there is no difference with respect to their seminal-fluid-generating parts[200] between selachian males and those in the egg-laying kind; that is, it is evident that seed can be squeezed from both at the proper season. And the females, for their part, also have a uterus. But it should not be only those that lay eggs that have a uterus but also the others, although it should be different from that of the egg-layers, if indeed the whole kind was female, although some of them are infertile (like mules in the kind with long hair in their tails[201]). But as things stand one lot have seminal-fluid-generating parts, the other lot uteruses, and in all except two, erythrinus and channa, the difference is the following one: the ones have seminal-fluid-generating parts, the others have uteruses. And the puzzle because of which they suppose things to be this way is easily resolved by harkening to what happens. For they say correctly

199. One of the "pipefishes," perhaps *Sygnatus acus*, of which the seahorse is another member. *HA* 567[b]21–26.

200. I.e., the spermatic ducts (716[b]17).

201. Reading ὥσπερ αἱ ἡμίονοι ἐν τῷ γένει τῷ τῶν λοφούρων. The kind is *Equus*.

that none of the animals that mate give birth to many offspring; for of those that from themselves generate complete ones, either animals or eggs, none is as prolific as the egg-laying fishes; for the quantity of their eggs is something immense.

But this is what they have overlooked, that the eggs of fishes do not [develop] in the same way as those of the birds. For the birds, whichever of the four-footed animals are egg-laying, and any of the selachians that are egg-laying, lay a complete egg, and it does not get its growth once it has emerged outside, while the fishes lay an incomplete one, and their eggs do get their growth outside. Further, in the case of the soft-bodied and soft-shelled animals it is the same way, yet these are actually seen copulating, because their copulation lasts a long time. And it is evident in these cases that the one is male, while the other has a uterus. It would be strange too if this [difference in] capacity did not exist in the entire kind, just as in the live-bearing animals one is male, another female. The cause of the ignorance of those who speak in **756^{a}1** the foregoing way is that the differences in the matings of animals and their processes of generation, differences that are of all sorts, are not clear to see. Instead, getting a theoretical grasp on them from a few cases, they think that the same must hold in all of them.

That is also why those who say that conceptions come from the gulping down of [male] seed by the females among the fishes have not understood some things when they speak in this way. For it is at around the same time that both the males have seminal fluid and the females have eggs, and the closer the female is to laying the eggs the more abundant and more liquid the seminal fluid of the males becomes. And just as the growth of the seminal fluid in the male and that of the egg in the female occurs at the same time, so it is too with their emission; for the females do not lay all their eggs at once, but a few at a time, nor do the males emit the seminal fluid at once. And all these things happen in accord with reason; for just as in some cases among the bird kind [a female] holds eggs without impregnation (but few and seldom—rather, most come from mating), so the same occurs in the case of the fishes, but to a lesser extent. And these spontaneous eggs that also occur in both are infertile if they are not sprinkled on by the male (in those kinds of them in which the male exists as well). In the birds, because the eggs are complete on emerging, it is necessary for this to occur while they are still inside; but in fish, because in all cases the eggs are incomplete and get their growth outside, even if no egg within becomes fertile from mating, nonetheless the ones outside are preserved by the sprinkling, and it is there that the seminal fluid of the males is used up. And that is why it comes down [the ducts] in smaller quantities at the same time as the eggs in the females do; for the males always follow along sprinkling seminal fluid on the eggs as they are laid. So there are males and females and all of them mate (unless in some kind the female and the male are not distinct), and without the semen of the male nothing of this [fish] sort comes to be.

What also contributes to the deception is the quickness of copulation among fishes of this sort, so that even many fishermen fail to notice it; for none of them observes something of this sort for the sake of knowledge; but nonetheless their

copulation has been seen. For the fishes mate in the same way as the dolphins, by
756[b]1 placing themselves side to side—that is, those whose tail prevents [another sort of copulation]. But ejaculation in the case of the dolphins takes a longer time, while in the cases of the fishes of this sort it happens quickly. That is why, not seeing it, but seeing the swallowing of the seminal fluid and the eggs, even the fishermen state
5 the simple-minded and oft-repeated account of Herodotus the storyteller,[202] to the effect that the fishes are conceived from the swallowing of seminal fluid, not comprehending that this is impossible. For the duct entered through the mouth goes into
10 the stomach, not into the uterus, and it is necessary for what enters the stomach to become nourishment (for it gets concocted). The uterus, however, is manifestly full of eggs—where did they enter it from?

3.6
Erroneous Theories of Bird Mating; the Trochus and Hyena

It is the same way with the generation of the birds. For there are some who say that the ravens and the ibis have sexual intercourse by mouth, and that, among the four-
15 footed animals, the weasel gives birth by mouth. For both Anaxagoras and certain others among the natural scientists say these things, speaking far too simply and without investigation. As regards the birds, they are deceived on the basis of a deduction, because the mating of ravens is seldom seen, while they are frequently seen
20 communing with each other with their beaks, which is something all the raven-like birds do. This is clear in the case of tame jackdaws.[203] Birds of the pigeon kind do the same thing, but because they also manifestly mate, they have not gained this reputation [for having sexual intercourse by mouth]. But though the raven-like kind
25 is not lecherous (for it is among the ones that lay few eggs), [it does do so,] since even it has been observed to mate. It is a strange thing, however, that these natural scientists do not deduce how the seed enters the uterus through the stomach, since the stomach always concocts whatever comes into it, just as it does nourishment. In fact, even these
30 birds have a uterus, and eggs that are visible near the diaphragm. The weasel too, like other four-footed animals, has a uterus in the same way as them, so how is the fetus going to make its way from the uterus into the mouth? Still, because the weasel gives birth to altogether tiny young, just as the other cloven-hoofed animals—about which
757[a]1 we will speak later[204]—also do, and often carry the newborns in the mouth, this belief[205] has come about.

Also very deceived are those who speak in a simpleminded way about the trochus and the hyena. For many people say that the hyena, and Herodorus of Heraclea says

202. 2.93.
203. *HA* 617[b]16–19.
204. 771[a]21–[b]14.
205. That weasels reproduce orally.

that the trochus,[206] has two sex organs, those of the male and those of the female, and that the trochus impregnates itself, while the hyena impregnates and is impregnated in alternate years. [But this is false,] for the hyena has been seen to have only one sex organ. For in some places there is no scarcity of opportunities to observe them. But hyenas have a line under their tail like the female sex organ.[207] Both the males and the females have this sort of sign, but males are caught more frequently. That is why, on the basis of these non-methodical observations, the belief [about their sex organs] has come about.

But about these things what has just been said is enough.

3.7
Mating of Fishes; Wind-Eggs in the Birds

As regards the generation of the fishes, however, someone might raise a puzzle as to what exactly the cause is due to which among the selachian-like fishes neither the females are seen shedding their embryos nor the males shedding their seminal fluid, while among the non-live-bearing fishes both the females are seen shedding their eggs and the males their seminal fluid. The cause of this is that the selachian-like kind does not, in general, generate much seed; and further, the females have their uterus near the diaphragm. For males differ from the males, and the females from the females, in a similar way; for the selachian kinds are also low-yielding as regards semen. But in the egg-laying ones, the male kind sprinkles its seminal fluid, just as the females lay their eggs, because of their quantity; for they have more seminal fluid than suffices for mating; for nature tends to use up the seminal fluid for helping to grow the eggs, once the female has laid them, rather than in composing them from the start. For as was said in the accounts further back and in the more recent ones,[208] the eggs of the birds are completed internally, those of the fishes externally. For in a certain way the latter are like those that give birth to larvae; for the larvae-generating animals emit an embryo that is yet more incomplete. Completion in both cases, both in that of the eggs of the birds and in those of the fishes, is produced by the male, except that in the case of the birds he does so internally (for they are completed internally), while in those of the fishes he does it externally, because the egg is incomplete when released outside. The result, however, is the same in both cases.

The wind-eggs of the birds become fertile, and those previously fertilized by mating with one kind of male change their nature to that of the later [kind of] mating male. And the eggs of the original male, which do not grow if the mating is interrupted,[209] when he has fertilized them by mating again, get their growth rapidly—not, **757b1**

206. It is not clear what animal is referred to.
207. *HA* 579b19–26.
208. 718b5–27, 755a11–b1.
209. Reading ἀναύξητα ὄντα ἂν διαλείπῃ τὴν ὀχείαν, ὅταν ὀχευθῇ.

however, during all of the time, but if the mating occurs earlier, before the change's occurring that leads to the separation of the white. But in the eggs of fishes, nothing of this sort is determined; instead, the males sprinkle seminal fluid on them quickly to preserve them. The cause of this is that these eggs are not two-colored. That is why a period of time of this sort is not fixed for them as in the case of the birds. And this has come about reasonably; for when the white and the yellow have been set apart from each other, the egg already contains the starting-point that comes from the male (for this is what the male contributes).

Wind-eggs, then, get their generation so far as is possible for them; for it is impossible for them to be completed into an animal (for perception is needed[210]). But both the females and the males—in fact, all the animals—possess the nutritive capacity of the soul, as has often been said.[211] That is why the egg itself, considered as an embryo of a plant, is complete, but, considered as that of an animal, incomplete. If, then, there were no male in their kind, the egg would have been laid as it in fact is in the case of certain fishes—if indeed there is any kind of such a sort as to generate without a male (but about this it was said[212] earlier too that it has not been adequately observed). But as things stand there is a male and a female in all the birds, so that insofar as the egg is a plant it is complete (and that is why it does not change again after being fertilized by mating), but insofar as it is not a plant, it is not complete, nor does anything else result from it; for it has come to be neither simply as a plant nor as an animal from copulation. On the other hand, eggs that come to be from mating that have the white set apart come to be from the first mating; for they already contain both starting-points.[213]

3.8
The Soft-Bodied and Soft-Shelled Animals

The offspring are produced in the same way too by the soft-bodied animals (for example, the cuttlefishes and things of that sort) and by the soft-shelled animals (for example, the crayfish and things of the same kind as these); for they too lay eggs from mating and the copulation of male with female is often seen. That is why those who say that all the fishes are female and lay eggs without mating are not speaking in a way based on methodical inquiry on this point either;[214] for to think that the former animals lay eggs from copulation while the fishes do not is a wondrous thing, while to have been unaware that they do is a sign of lack of experience. The copulation of all

210. 741a10–16.
211. E.g., 740b36–741a3.
212. 741a35–37.
213. Of perceptual soul, from the male; of nutritive soul, from the female.
214. 757a11–12.

these lasts a longer time than of all the others, like that of the insects, as is reasonable; for they are bloodless, which is why their nature is cold.

In cuttlefishes and calamaries the eggs appear to be two, because the uterus is divided and appears cloven, while of octopuses there appears to be one egg. The cause is that the shape is visibly round in form and spherical; for the cleavage is invisible when it is filled [with eggs]. The uterus of the crayfish is also cloven. All these animals also give birth to an incomplete embryo, and due to the same cause. The female crayfishes release their offspring onto themselves (that is why the females of these have larger flaps than the males, in order to protect the eggs), while the soft-bodied animals do so away from themselves. The male of the soft-bodied animals sprinkles [his seminal fluid] over the females just as male fishes do over the eggs, which become continuous and viscous. But in the crayfish-like animals something of this sort is neither seen nor reasonable; for the embryo is under the female and is hard-skinned. Both these [eggs] and those of the soft-bodied animals get their growth outside, just as those of the fishes do.

While coming to be, the cuttlefish [embryo] is attached to the eggs at its front part; for it is possible only here; for the cuttlefish alone has its front part and back part facing in the same direction. One must observe the mode of the configuration of its position while it is coming to be with the help of the *History of Animals*.[215]

3.9
The Insects

The generation of the other animals—those that walk, fly, and swim—has now been spoken about. In accord with the methodical inquiry we are following, the insects and hard-shelled animals must next be spoken about. Let us first speak, then, about the insects.

That some of these come to be from copulation, others spontaneously, was said previously,[216] and in addition that they give birth to larvae, and due to what cause they give birth to larvae. For pretty much all animals seem in a certain way to give birth to larvae at first; for the most incomplete embryo is of this sort; and in all animals, even the live-bearing ones and the egg-laying ones that produce a complete egg, it is by being at first indistinct that the embryo gets its growth. And the nature of the larva is of this sort. After this, some of the egg-laying animals generate a complete embryo, others an incomplete one, but it becomes complete outside, as has often been said[217] to be so in the case of fish. In the internally live-bearing animals, however, after its composition at the start, the embryo becomes in a certain way egg-like; for the liquid is encompassed by a thin membrane, as if someone were to take the **$758^{b}1$**

215. $550^{a}10–32$.
216. $721^{a}5–16$, $732^{b}10–14$, $733^{a}24–32$.
217. E.g., $749^{a}24–27$.

shell off eggs. That is why people call the "destruction" of embryos occurring at that time "effluxions."[218]

The insects that generate, generate larvae, and those that come to be not through copulation but spontaneously, come to be at first from a composition of this sort. For one must suppose caterpillars to be a certain form of larva too, also what comes from spiders. And yet some even of these and many of the others seem to be like eggs because of their round configuration. We must not speak by referring to their configuration, however, or to their softness and hardness (for the embryos of some of them are hard), but to the fact that the whole animal changes and does not come to be from [just] a certain part.[219]

All these larva-like things having emerged, and having reached the end of their growth in magnitude, come to be a sort of egg; for the sheath around them hardens and they are immobile during this period. This is clear in the case of the larvae of the bees, the wasps, and the caterpillars. The cause of this is that their nature, because of its incompleteness, lays eggs, as it were, before the proper time, as if the larva, while still in the process of growing, were a soft egg. It happens in the same way too in the case of all the others that come to be, not from mating, in wool or other such materials and in water.[220] For all of them, after their larva-like nature, become immobile and their sheath dries around them, and after this the sheath bursts and there emerges, as from an egg, an animal that has achieved completion at its third process of generation.[221] Among these, the winged ones are larger than those that walk.

Another occurrence, though in accord with reason, would also justly be a cause of wonder to many people; for the caterpillars at first get nourishment, but after that they no longer get it, and what are called "chrysalises" by some people are immobile, and the larvae of the wasps and the bees[, which take nourishment and contain visible excrement,[222]] after they become what are called "pupae," have nothing of this sort. For the nature of eggs too, when it has reached its end, is non-growing, but at first it grows and takes nourishment until it has become distinct and a complete egg has come to be. Among larvae, some contain within themselves the sort of thing from which, as they are nourished by it, this sort of residue[223] occurs—for example, those of the bees and the wasps, while others get it from outside, as the caterpillars and certain other larvae do.

Why, then, the coming to be of things of this sort occurs in three stages, and due to what cause from having been moving they become immobile again, has been stated. And some of them come to be from mating, as the birds, the live-bearing

218. *HA* 583ᵇ11–12.
219. Because this is the difference between an egg and a larva (732ᵃ29–32).
220. *HA* 557ᵇ1–5.
221. The three being larva, nymph, and adult animal.
222. Added from *HA* 551ᵃ29–ᵇ3 to fill a lacuna in the text.
223. I.e., the excrement.

animals, and most of the fishes do, while others come to be spontaneously, as some of the plants do.[224]

3.10
The Bees

The generation process of the bees involves much puzzlement. For if indeed it is a fact that in the case of some of the fishes there is a process of generation that generates without mating, the same seems likely to happen with the bees, judging from things that seem to be the case. For it is necessary for them either to bring the seed[225] from elsewhere (as some people say)—in which case it must either be something that grows spontaneously or that some other animal gives birth to—or to generate it themselves, or to bring some and generate others (for some people also say this, on the supposition that they bring only the seed of the drones). Again, if they do generate them, they do so either by mating or without mating. And if by mating, either each kind must generate its own kind or one kind must generate the others, or one kind by copulating with another—I mean, for example, bees from copulating bees, drones from drones, kings from kings, or all the others from one (for example, from the "kings" and "leaders," as they are called, or from the copulation of drones and bees; for some people say that the drones are males and the bees female, while others say that the bees are male and the drones female).

But all these views are impossible if we deduce things first from facts special to bees, second from those more common to the other animals. For if they do not give birth to the young but bring them from elsewhere, then bees should come to be, even if not brought anywhere by bees, in those places from which they bring the seed. For why when transferred will they come to be, but not do so there? For it is no less fitting for them to do so there, whether they grow in flowers spontaneously or whether some other animal gives birth to them. And if indeed the seed belonged to some other animal, that one should come to be from it, but not bees. Further, that they should collect honey is reasonable (for it is nourishment), but that they should collect seed that belongs to another and is not nourishment is strange. Indeed, for what's sake do they do it? For all the animals that busy themselves about the young work hard for what appears to be their own seed.

But then for the bees to be female and the drones male it is not reasonable either; **$759^{b}1$** for nature does not assign a weapon for strength to any females, but while drones are stingless, all bees have a sting. Nor is the contrary view reasonable, that the bees are male and the drones female; for no males are accustomed to work hard for their young, but as things stand the bees do this. And, in general, since it is evident that

224. $715^{b}25–30$.
225. *HA* $554^{a}21–23$.

the seed of drones comes to be even when there is no drone present, while the seed of bees does not come to be without the kings (which is why some people say that the seed of the drones alone is brought [from outside]), it is clear that they do not come to be from mating, either from each copulating with its own kind, or from bees and drones doing so. (That they should bring the seed of drones alone is impossible because of what was just said. Also, it is not reasonable that a similar affection not be characteristic of the entire kind of these.[226]) But then again it is also impossible for some of the bees themselves to be males and others females. For in all the kinds of animals the female differs from the male. Besides, if that were so, they would generate themselves. But as things stand, it is evident that their seed does not come to be if the leaders[227] are not among them, as they say. An objection jointly against both bees generating from each other and from drones (that is, together with and separate from each other) is that none of them has ever been seen mating, while if there had been female and male among them this would often have happened.

It remains, if indeed bees come to be from mating, for the kings to do the generating by copulating. But it is evident that the drones come to be even in the absence of leaders, and it is not possible either for the bees to bring the seed [of drones] or to generate it themselves by copulating. It remains, then, as appears to be so in the case of certain fishes, that the bees generate the drones without mating, that is, generating them by being female, but containing within themselves, as the plants do, both the female and the male. That is also why they have the instrument for strength. For we should not call something "female" in which the male is not separated. And if in the case of the drones this seems to occur, that is, that they come to be not from mating, it is necessary for the same argument to apply as well to the bees and the kings and that they should come to be not from mating. If, then, the seed of bees had manifestly come to be without the kings, it would have been necessary for the bees to **760ᵃ1** have come to be from themselves without copulation. But as things stand, since this is not what is said by those concerned with the care of these animals, it remains that the kings generate both themselves and the bees.

Because, then, the bee kind appears to be extraordinary and special, so too their process of generation appears to be special. For while generating without mating, as the bees do, may also occur in the case of other animals, not generating the same kind [as them], by contrast, is special; for even the erythrinus generates an erythrinus and the channa a channa. The cause is that bees themselves do not come to be in the same way as flies and animals of this sort, but rather from a distinct, though cognate, kind; for they come to be from the leaders. That is also why their process of generation in a way stands in a proportion;[228] for the leaders are similar to the drones in size, to the bees in having a sting. The bees are like them in this respect, then, and the drones

226. I.e., if drones are brought from outside, bees and kings should be as well, since they do in fact all belong to the same kind.
227. The kings.
228. 760ᵃ34–35.

are like them in size; for it is necessary for there to be some overlapping, unless the same kind must always come from each (but this is impossible; for then the entire kind would be leaders). The bees, then, are similar to them in capacity,[229] the drones in size.

If the drones also had had a sting, they would have been leaders. But as things stand, a puzzle remains; for the leaders are like both kinds at the same time, the bees in having a sting, the drones in size.[230] On the other hand, it is necessary for the rulers also to come to be from something. Since, then, they are neither from the bees nor from the drones, it is necessary for them to generate themselves. And their cells come to be at the end and are not many in number. So what happens is that though the leaders in fact generate themselves, they also generate another kind (that of the bees), and the bees, while they generate another kind (the drones), no longer generate themselves; rather, this has been subtracted from them. And since what is in accord with nature always has an order, because of this it is necessary for drones to have even generating another kind subtracted. And it is evident that this is precisely what happens; for though they are themselves generated, they generate nothing else; instead, the process of generation reaches its limit at number three [in the series].[231]

And so well has nature organized this that the kinds always remain in existence and none of them fails, though not all generate. And it is also reasonable for this to happen. In good years, much honey and many drones come to be, but in wet ones a large quantity of seed generally comes to be. For the wet periods produce more residue in the bodies of the leaders, while the good ones do so in those of the bees; for being smaller in size they need the good weather more. It is well too that the kings, since they have been made for producing offspring, remain inside, relieved from necessary sorts of work, and having magnitude, as the composition of their bodies is for begetting offspring, and that the drones be idle, as they have no weapons for fighting for nourishment, and because of the slowness of their bodies. The bees are intermediate to both (for in this way they are useful for work), and they are workers, as they nourish both their children and their fathers. And it is also in agreement with this that they attend on their kings because their generation is from them (for if nothing of this sort were the case, the facts about their leadership would not have a reason), and while they allow the kings to do no work, as being their parents, they discipline the drones as their children; for it is nobler to discipline children and those for whom there exists no work.

The fact that the leaders, though being few in numbers themselves, generate a large number of bees seems to be much the same as what happens in the generation of lions,[232] which at first generate five, later a smaller number, in the end one, then none at all. And the leaders at first generate a multitude, later a few of themselves

229. Secluding καὶ τῷ τίκτειν.
230. Reading εἰ . . . κηφῆσιν.
231. The three being leaders (kings), bees, and drones.
232. $750^{a}31–^{b}1$.

(the offspring of the latter being smaller), and nature, since it subtracted from their quantity, makes up for it in their size.

On the basis of reason, then, and on the basis of what seem to be the facts about them, matters having to do with generation of bees appear to be this way. The facts have certainly not been sufficiently grasped, but if at some time they are, one should take perception rather than reasonings to be what must carry conviction, and reasonings [only] if what they prove agrees with what appears to be the case.

An additional sign that it does not come to be from mating is the fact that the seed appears small in the cells of the comb, while those insects that come to be from mating copulate for a long time, but give birth to something larva-shaped and having magnitude.[233]

As regards the process of generation of animals of the same kind as bees—for example, the hornets and the wasps—it proceeds in much the same way in all of them, although what is extraordinary has reasonably been subtracted. For they have nothing divine in them as the bee kind does.[234] For the ones called "mother" wasps generate the young and mold together the first [cells] of the combs, but they generate by mating with each other; for their copulation has often been seen. As for how many differences each of these kinds exhibits, either in relation to each other or in relation to the bees, must be observed with the help of what is cataloged in the *History of Animals*.[235]

The process of generation of all the insects, then, having been spoken about, we must now speak about that of the hard-shelled animals.

3.11
The Hard-Shelled Animals

And what has to do with the process of generation of the hard-shelled animals is partly like, and partly not like, that of the others. And this is reasonable; for compared to animals they are like plants, while compared to plants they are like animals, so that in a certain way they appear to come to be from seeds, but in another way not from seeds, and in a way they appear to come to be spontaneously, but in another way from themselves, or some in the latter way, some in the former. Because their nature is a counterpart to that of the plants, no part, or a small part, of the hard-shelled animal kind—for example, the snails and any others of this sort, rare as they are—comes about in the earth; but in the sea and in similar waters there are many and they have every sort of shape. The plant kind, by contrast, is little—that is (one might almost say), not at all—represented in the sea and places of that sort, since all such things come to be on land. And, in fact, their nature stands in a proportion: the

233. This sentence is marked as misplaced.
234. *PA* 648ᵃ3–8.
235. *HA* 9.41.

nature of hard-shelled animals is as far apart from that of plants as the wet's being more characteristic of life is from the dry's and as water's is from earth's, since the hard-shelled animals tend, at any rate, to be related to the wet as plants are related to earth—as if plants were terrestrial shellfishes and shellfishes aquatic plants.

Due to this sort of cause too the animals in what is wet are more multiform than those in earth; for the nature of the wet is more versatile than that of earth, and not much less bodily, and the animals in the sea are most of all of this sort; for fresh water, though sweet and nourishing, is less corporeal and is cold. That is why all bloodless **761ᵇ1** animals whose nature is cold are not found in lakes nor in the fresher among brackish waters, except to a lesser extent (for example, the hard-shelled, the soft-bodied, and the soft-shelled animals; for all of these are bloodless and have a cold nature), while in lagoons and near the mouths of rivers they are found; for they seek at the same time warmth and nourishment, and the sea is both wet and much more corporeal than fresh water, its nature is hot, and it has a share of all the parts, water, breath, and earth, so that it also shares in all the living things that come to be in each of these places. For the plants may be assigned to land, the aquatic animals to water, the terrestrial animals to air. But the more and the less, and nearer and further away, produce a great and wondrous difference. As for the fourth kind, it must not be sought in these places, and yet it certainly wishes to be one corresponding to fire in the order; for it is counted as the fourth of the [elemental] bodies. But fire always appears to have a shape that is not special to it; on the contrary, it is always in another of the bodies; for what is on fire appears to be either air, smoke, or earth.[236] Instead, this fourth kind must be sought on the moon; for the moon appears to participate in [the elemental body] at the fourth remove.[237] But these issues are for another account.[238]

As for the nature of the hard-shelled animals, some are composed spontaneously, some emit [something with] a certain capacity from themselves, but these also often come to be from spontaneous composition. We must, then, grasp the modes of generation of plants.[239] For some of these come to be from seed, some from cuttings that are planted out,[240] others by budding-off—for example, the onion kind. This is the way mussels come to be; for smaller ones are always growing alongside the starting one. But the whelks, the purpuras, and those that are said to make honeycombs[241] emit a mucilaginous liquid that is like one of a spermatic nature. We must, however, consider none of these emissions to be seed, but rather regard these animals as participating in the way just stated in a likeness to the plants. That is why too a large number of such animals come to be when one has come to be. For though it happens that all these animals come to be spontaneously as well, proportionally more do if **762ᵃ1**

236. *GC* 331ᵇ25–26, *PA* 649ᵃ18–22.
237. I.e., fire.
238. No such account is extant.
239. Because hard-shelled animals are like plants (761ᵃ16–17).
240. *Long.* 467ᵃ25–30, *Juv.* 468ᵇ17–18.
241. *HA* 546ᵇ19–21.

some are already composed. For it is reasonable that each have some residue left over from the starting one, from which each of the animals growing alongside it buds off. And since nourishment and its residue have much the same capacity, it is likely that the substance of the comb-makers is like that of the one composed at the start. That is why it is reasonable that they also come to be from it.

The ones that neither bud off nor make combs come to be spontaneously. And it is evident that all those composed in this way, whether in earth or in water, come to be in cooperation with putrefaction and an admixture of rainwater; for as the sweet is disaggregated into the starting-point that is being composed, the residue of the mixture takes this shape; for nothing comes to be by putrefaction but by concoction; for putrefaction, that is, the putrefied thing, is a residue of concoction; for nothing comes to be from the whole of anything, any more than in the case of what is crafted due to craft—for if it did, craft would have nothing to do. But as things stand, in the one case, craft subtracts what is useless, and in the other, nature does.

Animals and plants come to be in earth and in liquid because in earth there is water present and in water breath, and in all breath there is soul-involving heat, so that in a certain way all things are full of soul. That is why they are quickly composed once it has been enclosed. And it gets enclosed and occurs as a foamy bubble when wet bodies heat up. And the differences that determine whether the kind of a thing being composed is more estimable or non-estimable lie in the enclosure of the soul-involving starting-point. Both the places and the body that is enclosed are causes of this. But in the sea there is much earthen material present. That is why it is from such material that the nature of the hard-shelled animals is composed: earthen material hardens all around them, solidified in the same way as bones and horns (for they are unmeltable by fire), and on the inside the body that possesses life is enclosed.

The snail kind is the only one of these sorts of animals that has been seen copulating. But whether their generation is from copulation has not so far been adequately observed.

Anyone wishing to inquire correctly might well ask what corresponds to the **762b1** material starting-point in the composition of animals of this sort. For in females this is a certain residue belonging to the animal, potentially of the same sort as that from which it came, which the starting-point from the male moves and completes into the animal. But here what should one say this sort of thing is, and where does the movement-causing starting-point corresponding to the male come from, and what is it? We must grasp, then, that, even in animals that generate, it is from the incoming nourishment that the heat present in the animal makes the residue, the starting-point of the embryo, by disaggregation and concoction. It is the same way in the case of plants too, except that in these, as in certain of the animals, there is no additional need of the starting-point from the male (for they have it mixed within themselves), while in most animals the residue does need it in addition. For some, the nourishment is water and earth; for others, it is things composed of these, so that what the heat present in animals produces from the nourishment is precisely what

the seasonal environmental heat aggregates and combines from seawater and earth by concoction. And the part of the soul-involving starting-point that is either enclosed or disaggregated in the breath produces an embryo and implants movement in it. The composition of [all] the plants that come to be spontaneously is of the same form; for they come to be from a part, which is for the outgrowths either a starting-point or their first nourishment.[242]

Among the animals, on the other hand, some give birth to larvae, both the bloodless ones that are not produced from animals and among the blooded ones, for example, a certain kind of mullet and of other river fishes, and further the eel kind; for all of these, even though having little blood, have nonetheless a blooded nature, and have a heart, which is the starting-point of the parts, that is sanguineous. And the ones called the "intestines" of earth have a larva's nature, and in these the bodies of the eels come to be. That is why, even as regards the generation of the human beings and the four-footed animals, one might suppose that, if indeed they were really earth-born, as some people say, they came to be in one or another of two ways; for either it is by first being composed as a larva or from eggs. For it is necessary for them either to have within themselves the nourishment for growth (and an embryo of this sort is a larva) or to get it from elsewhere, and this either from the female progenitor or from part of the embryo. So, if the former of the two is impossible, that is, for it to flow from the earth as it does from the mother in the case of other animals, it is necessary to get it from a part of the embryo. And generation of this sort, we say, is from an egg. **$763^{a}1$**

If indeed there was such a starting-point for the generation of all animals, then, that it is reasonable for it to be one or the other of these two is evident. But there is less reason for it to be from eggs; for we see none of this sort of generation of any animal, but we do see the other sort, both in the blooded ones mentioned[243] and in the bloodless ones. Some of the insects are of this sort as are the hard-shelled animals that our account concerns; for they do not come to be from a certain part as the offspring of the egg-laying animals do, and their growth is produced in a similar way to that in larvae. For larvae grow toward the upper part and the starting-point; for the nourishment for the upper parts is in the lower one. And this proceeds in a similar way in those that come from eggs, except that these use up all of it, while in the offspring of larvae-generators, when the upper part has grown from what is composed in the lower part, the lower part gets articulated from what is left over. The cause is that later on also the nourishment occurs in all animals in the part below the diaphragm.

That this is the way the larva-like animals have their growth produced is clear in the case of the bees and animals of this sort; for at the start their lower part is large, while their upper one is small. And, in the case of the hard-shelled animals, matters having to do with growth proceed in the same way. This is also evident in the case

242. $715^{b}27$–30.
243. Mullets and eels ($762^{b}23$–24).

of the spirals of the spiral-shelled animals; for as the animal grows, they always grow larger toward the front and the so-called head.

The way the generation proceeds, then, both of these and of the other animals that come to be spontaneously, has been pretty much stated.

That all the hard-shelled animals are composed spontaneously is evident from such facts as the following. They come to be on the side of boats when the foamy mud putrefies. Also, in many places where previously nothing of this sort existed, when later the place became muddy through a dearth of water the ones called "lagoon" oysters, a sort of hard-shelled animal, come to be. For example, when a naval expedition cast anchor near Rhodes, some clay pots were thrown out into the sea, and as time went on and slimy mud had collected around them, shellfishes used to be found inside them. And a proof that these sorts of animals do not emit anything generative from themselves is this: when certain Chians carried some live shellfishes over from Pyrrha in Lesbos and deposited them in certain Euripus-like places in the sea where currents clash, but though as time passed they greatly increased in size, they became no more numerous. As for their so-called eggs, they contribute nothing to generation, but are [just] a sign of being well nourished, like fat in blooded animals. That is also why for purposes of eating they become well flavored at these periods. A sign [that these are not really eggs] is that these sorts of animals—for example, the pinnae, the whelks, and the purpuras—always have them, except that sometimes they are larger, sometimes smaller. Others have them not always, but rather in the spring, in diminishing quantities as the season advances, and in the end disappearing altogether—for example, the scallops, the mussels, and ones called "lagoon" oysters; for this season is advantageous to their bodies. In others—for example, the sea squirts—nothing of this sort is noticeable.

The particulars concerning these and the places in which they occur must be observed with the help of the *History of Animals*.[244]

BOOK 4

4.1
Causes of Sex Differentiation in the Embryo

The generation of the animals, then, has now been spoken about, both in common and about all of them separately. But since in the most complete of them the female and the male are separated, and since we say that these capacities are the starting-points of all plants and all animals (although some have them unseparated, others separated), we must speak first about the generation of these; for while the

244. 4.4, 5.15, 590[a]18–[b]3.

animals are still incomplete in their kind, the female and the male are distinct. But whether one is female and another male before the difference is clear to perception, the difference being acquired by them in the mother or earlier is disputed.

For some people—for example, Anaxagoras and others among the natural scientists—say that this contrariety is present in the seeds from the outset; for the seed, they say, comes from the male, while the female provides the place, and the male is from the right, and the female from the left, and while males are on the right of the uterus, females are on the left. Others say that it is in the matrix, just as Empedocles does; for the [seeds] that enter a hot womb become males, he says, while those that enter a cold one become females, the cause of the hotness or coldness being the flow of the menses, as it is colder or hotter, older or more recent.

Democritus of Abdera says that the difference of female and male occurs in the mother; nonetheless it is not because of the heat and cold that one becomes female and another male, but rather on whose seed would master whose, that is, the seed that has come from the part by which male and female are differentiated from each other. For Empedocles really made a rather careless assumption in thinking that female and male differ from each other only in coldness and hotness, while seeing that all the parts exhibit the great difference that we meet in male sex organs and the uterus. For if fabricated animals, one having the parts of the female and the other those of the male, were put into the uterus as into an oven, the one having a uterus into a hot one and the one not having it into a cold one, the one not having a uterus will be female, and the one having it will be male. But this is impossible. So, in this respect, what Democritus says is better; for he seeks the difference belonging to this generation [of male and female], and tries to state it—whether he does so correctly or incorrectly is another story.

Moreover, if hotness and coldness were the cause of the difference of the parts, those who speak that way should have stated this; for this (one might almost say) is what speaking about the generation of male and female consists in; for there is a manifest difference between them. And it is no small task, from hotness and coldness as starting-point, to draw conclusions about the generation of the parts, as if it necessarily follows that by the animal's being cooled this part called the "uterus" comes to be, while by its being heated it does not come to be. It is the same way too with the parts that effect sexual intercourse; for these also differ in the way stated previously.[245]

Further, male and female twins[246] are often found together in the same part of the uterus—and this we have adequately observed from dissections in all the egg-laying animals, both in the terrestrial ones and in the fishes. If, then, Empedocles had not seen this, it is reasonable for him to make an error in stating this cause of his. If, on the other hand, he had seen it, it is strange to still consider the cause to be the hotness

245. Especially in 1.2.

246. I.e., all cases in which at least one male and one female embryo is produced in the same part (left or right) of the uterus.

or coldness of the uterus; for, if it were, they would both become female or both male. But as things stand, this is not what we see happening.

He says too that the parts of what comes to be are "torn asunder" (for some are in the male, he says, others in the female, which is also why they have an appetite for sexual intercourse with each other). It is necessary, then, for the magnitude of these parts also to be torn asunder and for an assembly to occur, but not because of cooling and heating. But about this sort of cause for the seed there are no doubt many things to say [in criticism]; for, in general, this manner of cause seems to be fabricated. If, however, the facts about seed are as we have stated, and it does not come from all [parts] nor, in general, does what comes from the male provide any matter whatever to what is coming to be, then one must make a reply to Empedocles, Democritus, and anyone else who speaks in a similar way. For it is not possible for the body of the seed to be torn asunder, part in the female and part in the male, as Empedocles states when he says, "Torn asunder is the nature of the limbs, this part in man's. . . ."[247] Nor is it possible for the totality of it to be secreted from each, and for a female or male to come to be as one part masters another.

In general, it is certainly better to say that the excess of one part, by its mastery, generates a female than, giving thought to nothing, to make heat alone the cause. However, the fact that at the same time the shape of the sex organ is also distinct needs an argument for its always following along with the other.[248] For if it is because they are nearby, then each of the remaining parts should follow along too—for one of the prevailing parts is near another part, so that the offspring, if female, would at the same time be like its mother [in all other respects], or, if male, like its father.

Further, it is also absurd to think that only these parts must come to be, without the whole body changing, and particularly and primarily the blood vessels, around which, as around an outline, the body of the flesh is laid.[249] It is not reasonable that these become of a certain quality because of the uterus, but rather the uterus because of them; for although each is a receptacle for a certain sort of blood, that of the blood vessels is prior.[250] But the movement-producing starting-point is necessarily always prior, and by being of a certain quality is the cause of generation. A difference of these parts in relation to each other in females and males results, then, but it must not be thought of as a starting-point or a cause, but rather something else must, even if no seed is secreted either from the female or from the male, but rather what comes to be is composed in any and every way.

The very same argument may be used against those who say that the male comes from the right and the female from the left as the one used against Empedocles and against Democritus. For if the male contributes no matter at all [to the embryo], those who speak in this way would be saying nothing; but if, as they say, it does

247. B63 DK.
248. I.e., why the uterus and the female external genitalia always go together.
249. 743ᵃ1–2, *HA* 515ᵃ34–35.
250. 740ᵃ17–19.

contribute some, it is necessary to reply in the same way as to Empedocles' argument, which distinguishes the female from the male by the hotness and coldness of the uterus. For their part, they do the same thing [he does] by distinguishing by lefts and rights, while seeing the female and the male also differing by their [sexual] parts as a whole. So, what for them is the cause due to which the body of the uterus exists in those [embryos] that come from the left and not in those that come from the right? For if it were to come [from the left] and not possess this part, it would be a female not possessing a uterus or a male possessing one, as luck would have it. Further, precisely as was also said previously,[251] a female has been seen in the right part of the uterus, a male in the left, and both in the same part, and this not only once but often, or the male one in the right, the female in the left, and no less often both come to be in the right.[252]

In much the same way, certain people who were persuaded by these things said that if the right or left testis is tied up in mating the result is a male offspring or a female offspring, respectively; for in fact Leophanes spoke this way. And in a case where one or other testis is cut out some say that the same happens, not speaking the truth but prophesying about what will happen based on likelihoods and assuming things in advance before seeing how they turn out. Further, they do not know that these parts contribute nothing to the generation of male offspring and female offspring in the animals. A sign of this is that many animals that are themselves both female and male, and generate females and males, do not have testicles, as those not having feet do not—for example, the fish kind and the snake kind.

To think that hotness and coldness are the cause of male and female, or that the secretion coming from the right or from the left is the cause of their coming to be, is reasonable to some extent; for the right side of the body is hotter than the left, and the concocted seed hotter than the unconcocted, and what has been composed is something of this sort, and what has been composed is more fertile. But to speak in this way is to grasp the cause from too far away, and we must most of all move on by all possible means toward the primary causes.[253]

The body as a whole and its parts, what each of them is and what cause it is due to, has been spoken about previously elsewhere.[254] But since the male and the female are distinguished by a certain capacity and a certain incapacity (for what is capable of concocting, composing, and emitting seed containing the starting-point of the form is male—and by "starting-point" I mean not the sort from which as from matter an offspring comes to be that is of the same sort as the progenitor, but rather the primary moving-producing one, whether capable of producing it within itself or in something else), while what is receptive of seed, but incapable of composing and emitting it, is female; further, if all concoction works by heat; then it is necessary for the males of

251. $764^{a}33$–36.
252. Retaining ἤ τὸ ἄρρεν . . . τοῖς δεξιοῖς.
253. I.e., the proximate ones.
254. *PA* 2–4, *GA* 1.

the animals to be hotter than the females. For it is because of coldness and incapacity that the female is more abundant in blood in certain parts. And this is a sign that goes contrary to what some people think is the precise cause due to which the female is hotter than the male: the emission of menses; for blood being hot, what has more is hotter. They suppose, however, that this affection occurs because of an excess of blood and heat, as if it were possible for everything and anything to be equally blood if only it is liquid and sanguineous in color, and not for it to become less in quantity and more pure in quality in those that are better nourished. For them it is as with the residue in the bowel, where more rather than less, they think, is a sign of a hotter nature. And yet it is the contrary; for just as in the workings having to do with wheat,[255] where the nourishment in its first stage is abundant, and in the end the last stage is nothing compared to the quantity in the first stage, so too in the body: the parts receive the nourishment in turn for their work, from the entirety of which the final result is altogether small. In some this is blood, in others, its analog.

Since the one sex is capable and the other incapable of excreting a residue that is pure, then, and for every capacity there is an instrument, the same for the one that completes [its work] in an inferior way as for the one that does so better, and since things are said to be capable and incapable in many ways, and the female and the male are opposed in this one, it is necessary, then, for there to be an instrument both for the female and for the male; for the first the uterus, for the second the penis. And nature assigns to each both the capacity and the instrument together; for it is better that way. That is why each of the places comes to be together with the excretions and the instruments, and just as the sight is not completed without the eye nor the eye without sight, so too the bowel and bladder come to be together with the capacity to generate the residues.

And since it is from the same thing that something both comes to be and grows (and this is the nourishment), each of the parts should come to be from the sort of matter and the sort of residue that it is receptive of. Second, and contrariwise, it comes to be, we say, in some way from its contrary. Third, in addition to these points, we must grasp that if indeed a thing passes away to its contrary, what is not being mastered by what crafts it also necessarily changes to its contrary. From these principles it should presumably already be more evident what the cause is due to which one thing becomes female and another male.

For when the starting-point is not doing the mastering, is not capable of concoction because of deficiency of heat, and does not lead toward its own special form, but is defeated in this respect, it is necessary for it to change to its contrary. But what is contrary to the male is the female, and contrary in that respect whereby the one is male and the other female. And since it differs in the capacity it possesses, so too the instrument it possesses differs, so that it changes to its contrary. And as one vital part changes, the whole composition of the animal differs greatly in form. This may be

255. 728ᵃ25–30.

seen in the case of eunuchs, who, though deformed in [only] one part, utterly change their old shape and fall short [only] a little from the visible form of a female. The cause of this is that some of the parts are starting-points, and when a starting-point is moved [or changed], it is necessary for many of the parts that follow along with it to change in step.

If, then, the male is a certain starting-point and cause, and it is male insofar as it is capable of something, female insofar as it is incapable, and the defining mark of the capacity, and of the incapacity, is being capable of concocting, or being incapable of concocting, the last stage of the nourishment (which in the blooded animals is called "blood" and in the others its analog), and the cause of this resides in the starting-point, that is, in the part of the body that contains the starting-point of the natural heat, it is necessary in the blooded animals for a heart to be composed, and for what comes to be to be either male or female, and in the other kinds that have the female and the male, an analog of the heart. This, then, is the starting-point and the cause of male and female and in this it resides. But the animal is by this time female or male when it also has the parts by which the female differs from the male; for it is not by virtue of any part whatever that it is male or female, any more than in the case of seeing or hearing.

To recapitulate, we say that the seed has been established to be a residue of the nourishment, the last stage of it. And by "last stage" I mean what is carried to each [part], which is also why what comes to be is like its progenitor; for it makes no difference whether it comes from each of the parts or that it goes to each of them—but the latter is more correct. But the seed of the male differs [from that of the female] because it contains a starting-point within itself of such a sort as to cause movement in the animal too[256] and to concoct the last stage of the nourishment, while that of the female contains matter alone. When it has mastered [the latter], it draws [it] to itself, but when it has been mastered, it changes to its contrary or to being destroyed. And contrary to the male is the female, and it is female due to the unconcoctedness and coldness of its sanguineous nourishment. And nature assigns each of the residues to the part receptive of it. But the seed is a residue, and this in the hotter of the blooded animals—that is, the males—is moderate in quantity. That is why the parts receptive of this residue in the males are ducts. In the females, on the other hand, because of unconcoctedness, there is a [large] quantity of sanguineous material (for it is incapable of being worked up). So it is also necessary for there to be some part receptive of it, and for this to be unlike [that in the male] and to have magnitude. That is why the nature of the uterus is of this sort. And it is by this part that the female differs from the male.

Due to what cause, then, one thing is female and another male has been stated.

256. Reading καὶ ἐν τῷ ζῴῳ. The animal referred to is, as often, the embryo.

4.2
Evidence for the Proposed Theory of Sex Differentiation in the Embryo

And the facts are proofs of what was said. For the young are more productive of females than those that are in their prime, as too are those that are older; for in the former the heat[257] is not yet complete, while in the latter it is failing.

Also, bodies that are more liquid and more womanly are more generative of females, and liquid seeds more than those that have been more composed. For all of these come to be because of a want of natural heat, and there is more production of males when the winds are north than south; for bodies are more liquid during south winds, so that they are more productive of residue. And the more residue there is the more difficult it is to concoct. That is why the seed in males, and the menstrual excretion in females, is more liquid [then].

Also, due to the same cause, when the menses occur in accord with nature they occur more when the moon is waning. For this time of the month is colder and more humid due to the waning and failing of the moon; for while the sun in the whole year produces winter and summer, the moon does so in the month (this is not because of the solstices, but the one occurs when the light is increased, the other when it is waning).

Shepherds say too that it makes a difference to the production of females and the production of males not only if mating occurs during north winds or south winds, but also if while copulating the animals look south or north. So small a thing, they say, will sometimes shift the balance, becoming a cause of cold or heat, and these of generation.

In general, then, female and male are set apart from each other in relation to production of males and production of females due to the causes stated. Nonetheless, there must also be a proportion in their relation to each other; for all things that come to be either in accord with craft or nature exist in virtue of a certain ratio.[258] But the hot, if it is too mastering, dries up the wet things, while if it is very deficient it does not compose them, instead it must stand in the mean ratio in relation to what is being crafted. If it does not, just as in cooking where too much fire burns the food, while too little does not cook it, and either way the result is that what is coming to be fails to be completed, likewise too in the case of the mixing of what comes from the male and what comes from the female there must be a proportion. And because of this it often happens to many [couples] that they cannot generate with each other, but being separated generate [with other partners], and these contrarieties occur sometimes in young people, sometimes in older ones, alike concerning generation and infertility, and production of males and production of females.

257. I.e., the soul-involving natural heat whose starting-point is in the male semen (766a35–36, b34).

258. 734b19–735a4.

Region differs from region, and water from water, in these respects due to the same causes; for the nourishment and especially the condition of the body become of a certain quality due both to the blend of the surrounding air[259] and of the things that enter in, especially the liquid nourishment; for this is most brought in, and this is in all nourishment, even in dry foods. That is why hard cold waters in some cases produce sterility, in others the production of females.

4.3
Heredity; Monstrosities (1)

And the same causes explain why: some offspring are like their procreators, others not like them; some are like their father, others like their mother, both in the body as a whole and in each part; and are more like them than like their ancestors; and are **$767^{b}1$** more like these than like random people; and males are more like their father, females more like their mother; and some, though like none of their kin, are nonetheless like some human being at least; while others are not like a human being in their visible form but already like a monstrosity. For in fact what is not like its parents is already in a certain way a monstrosity; for nature in these cases has in a certain way deviated from the kind.

And a first starting-point is when a female comes to be and not a male—but this is necessary by nature; for the kind that is separated into female and male must be preserved, and since it is possible for the male sometimes not to master, either due to youth or age, or due to some other cause of this sort, it is necessary for production of females to occur among the animals. The monstrosity, by contrast, is not necessary in relation to the for-the-sake-of-which and the final cause, but is necessary coincidentally, for the starting-point must be grasped from the following: If the spermatic residue in the menses is well concocted, the movement from the male will generate a shape that corresponds to itself; for it makes no difference whether we say the semen or the movement that makes each of the parts grow, or again what makes them grow or what composes them at the start; for the account of the movement is the same [in either case]. So if this movement masters, it will generate a male, not a female, and one that is like the male progenitor and not like the mother. But if it does not master, with regard to each capacity, whatever it is, that has not mastered, it makes [the embryo] correspondingly deficient.

I mean "each capacity" in the following way. What generates is not only [the generic] male but also this sort of male, for example, Coriscus or Socrates, and not only is it Coriscus, but also human. It is in this way, then, that some things are closer and others further away that belong to the male progenitor, insofar as he is generative, and not coincidentally—for example, if the male progenitor is knowledgeable in

259. $777^{b}6–7$.

grammar or someone's neighbor. But what is special and what is particular is always stronger in relation to generation. For Coriscus is both human and animal, but human is closer to what is special [to him] than animal is. Both the particular and the kind generate, but the particular more so; for this is the substance. For though what comes to be comes to be this sort of thing too, it also comes to be a this something—and this is the substance. That is why the movements existing in the seed are from capacities such as all these, and, but potentially, from those of the ancestors as well, but especially those that are closer to a certain particular. By a "particular" I mean Coriscus or Socrates.

Since everything is shifted not into any random thing but into its opposite, what is not mastered in generation is also necessarily shifted and becomes its opposite, with regard to the capacity in which the progenitor and mover has failed to master. If, then, it has not mastered insofar as it is male, it becomes female, if insofar as it is Coriscus or Socrates, it becomes not like its father but like its mother; for as what is opposed, in general, to the father is the mother, what is opposed to a particular male progenitor is a particular female progenitor. And likewise with respect to the capacities that stand next in order; for it always changes more to the next of the ancestors, whether to those of the father or to those of the mother.

Some of the movements are present [in the semen] actively, others potentially: actively those of the male progenitor and the universal (for example, human, animal); potentially, those of the female and the ancestors. On the one hand, then, [movements], when shifted, change to their opposites, and, on the other hand, the movements doing the crafting slacken into those near them—for example, if that of the male progenitor slackens, it changes by a very small difference to that of his father, and in the second instance to that of his grandfather. And in this way too, of course, in the case of females, the movement of the female progenitor slackens into that of her mother, and if not to this, then to that of her grandmother. And likewise in the case of the more remote ancestors.

It is, then, most of all natural for it insofar as it is male and for it insofar as it is father to master and be mastered at the same time; for the difference here is small, so that it takes no work to have both happen at the same time; for Socrates is this sort of man and this man. That is why, for the most part, males are like their father and females like their mother, for the displacement to both has come about at the same time. And female is opposed to male, mother to father, and displacement is into opposites.

But if the movement from the male masters while the one from Socrates does not, or vice versa, then the result is that males come to be that are like mother and females like father.

If the movements slacken, that is, the movement insofar as it is male stands fast, but the movement from Socrates slackens into that of his father, the result will be a male that is like its paternal grandfather or some other of its more remote ancestors, in accord with the same account. But if the movement insofar as it is male is mastered,

the result will be female and most often like its mother, but if this movement too slackens, the similarity will be to the mother's mother or some other of her more remote ancestors, in accord with the same account.

And it is also the same way in the case of the parts; for of the parts too some are like the father, others like the mother, and others like the ancestors; for some of the movements of the parts too are present in them actively, others present potentially, as has often been said.[260] **$768^{b}1$**

But we must take the following as universal hypotheses: one, what was said just now, that some movements are present potentially, others present actively, but also two others, that if it is mastered it is shifted into its opposite, and if it slackens it does so into the movement next in order, and if it slackens less, into what is near, if more, into what is further away. In the end, the movements are so confused that there is no likeness to family members or those of like kind, but only what is common remains, being human. The cause of this is that the latter follows along with all the particulars; for human is universal, while Socrates, father, mother, whoever she may be, are among the particulars.

And the cause of the slackening of the movements is that what affects is also affected by what is affected—for example, what cuts is blunted by what is cut, what heats is cooled by what is heated, and, in general, what moves (except for the primary mover) is moved in return with a certain movement (for example, what is pushed is in a way pushed in return, and what compresses is in a way compressed in return). Sometimes too it is on the whole affected more than it affects, and what heats is cooled and what cools is heated, sometimes not having affected at all, sometimes having affected less than it has been affected. These things have been spoken about in the determinations concerning affecting and being affected, as has in what sorts of beings affecting and being affected belong.[261]

What is affected is shifted and is not mastered, either because of a deficiency of capacity in what is concocting and causing movement or because of the large quantity and coldness of what is being concocted and distinctly formed; for by mastering at one point and not mastering at another it makes what is being composed multiform. For example, in the case of athletes this happens because of eating so much; for because of the quantity of nourishment the nature is not capable of mastering it so as to produce proportional growth and maintain the sameness of shape. The parts thus become qualitatively different, and sometimes in such a way that they are pretty much nothing like they were before. And the disease called "satyriasis"[262] is much the same as this; for in this too, because a large quantity of unconcocted flux or breath[263] is diverted to the parts of the face, the face appears to be that of another animal or of a satyr.

260. E.g., $737^{a}18–30$.
261. *GC* 1.6–7, in particular, $324^{a}24–^{b}13$.
262. Perhaps elephantiasis or a stage thereof.
263. Retaining ἢ πνεύματος.

All of the following have now been determined: due to what cause a female and a
769ᵃ1 male come to be; why some resemble their parents, females female ones, males male ones, and others the reverse, female like the father and males like the mother; and, in general, why some are like their ancestors, others like none of them; and these things
5 both with regard to the whole body and each of its parts.

Certain of the natural scientists, however, speak otherwise about the cause due to which offspring that are like and unlike their parents come about. Indeed, they speak of the cause in two ways. For some say that the one of the two from which
10 more seed comes is the one the offspring is more like, equally for totality in relation to totality and part in relation to part, on the supposition that seed comes from the parts of each. And if an equal amount comes from each of the two, then the offspring, they say, is similar to neither. But if this is false and seed does not come from all [the parts], clearly neither can the cause of similarity and dissimilarity be the one they
15 state. Further, how at the same time a female offspring can be like her father and a male one like his mother is not something they can in a puzzle-free way determine; for while those who speak, as Empedocles and Democritus do, of the cause of female and male say things that are in another way impossible, those who say that it is due
20 to the more or less [seed] coming from male or female, and that it is because of this that one offspring is female and another male, could not demonstrate in what way the female is to be like the father and the male like the mother; for that more should come from both parents at the same time is impossible. Further, due to what cause is an offspring, for the most part, like its ancestors, even the more remote ones? For no
25 seed has come from them, at any rate.

But those who speak in the remaining way about the similarity and the other things speak better, especially about it. For there are certain people who say that the semen, though one, is like a universal seedbed (*panspermia*)[264] consisting of many [seeds]. It is as if someone were to mix together many juices in one liquid and then
30 take some from it, it would be possible to take, not an equal quantity of each always, but sometimes more of this one, sometimes more of that, sometimes some of one and none at all of another—this, they say, results too in the case of the semen's being a mixture of many [seeds]; for the progenitor from whom the most comes in is the one
35 the shape [of the offspring] is like. Though this account is not perspicuous and is in many respects fabricated, it means to be saying something better, that it is not actively
769ᵇ1 but potentially that what it calls a "universal seedbed" exists; for in the first way, it is impossible, but in the second it is possible.

But it is not easy, by assigning a cause in [only] one way, to state the cause of all the cases: of male and female coming to be; why the female is often similar to the
5 father, the male to the mother; and, again, of the similarity to ancestors; further, due to what cause the offspring is sometimes human, though not similar to any of these,

264. This notion stems from Anaxagoras (59B4a DK), but Aristotle applies it to Democritus as well (*Ph.* 203ᵃ21–23).

and sometimes, proceeding in this way, appears not even human but rather a sort of animal only, the ones that are indeed even called "monstrosities."

And in fact, following what was said, the next thing is to speak about the cause of these sorts of monstrosities. For in the end, when the movements [from the male] slacken and the matter [from the female] is not mastered, what is most of all universal stands fast—and this is [the generic] animal. Then people say that what comes to be has the head of a ram or a cow, and in other cases, in like fashion, that of another animal—for example, that a calf has a child's head, or a sheep that of a cow. But though all of these result due to the causes stated, none is what it is said to be, but a likeness only—which is precisely what comes to be even when there is no deformation involved. That is why those who make jibes often liken some people who are not beautiful to a fire-breathing goat, others to a butting ram. And a certain physiognomist[265] has reduced all faces to those of two or three animals, and, in so arguing, often persuaded people.

But that it is impossible for a monstrosity of this sort to come to be (that is, one [kind of] animal inside another) is made clear by the periods of pregnancy, which are much different in the human being, the sheep, the dog, and the cow. And it is impossible for each [kind] to come to be except in its proper time.

This, then, is one way things are said to be monstrosities, others are said to be so for having extra parts to their shape, [for example,] being born with extra feet or extra heads.

The accounts of the cause of what has to do with monstrosities are close to, indeed much the same as, those of what has to do with deformed animals. For monstrosity is a sort of deformation.

4.4
Monstrosities (2)

Democritus said that monstrosities come to be because two lots of semen fall [into the uterus], one being set in movement earlier, the other later, and this latter, once it issues forth [from the male], arrives in the uterus,[266] so that the parts [of the embryo] grow together and become confused. But in the birds, he says, since mating always takes place quickly, both the eggs and their color become confused. But if several offspring come to be from one semen and one act of sexual intercourse, which is precisely what appears to be the case, it is better not to go the long way around, passing the short one by;[267] for especially in such cases it is necessary for this to occur when

265. Identity uncertain.

266. Reading διὰ τὸ δύο γονὰς πίπτειν, τὴν μὲν πρότερον ὁρμήσασαν τὴν δ' ὕστερον, καὶ ταύτην ἐξελθοῦσαν ἐλθεῖν εἰς τὴν ὑστέραν.

267. The thought seems to be that Democritus practices economy of explanation by explaining confusion in egg color in essentially the same way as monstrosities.

the seeds are not disaggregated but instead arrive together [in the uterus]. If, then, we must attribute the cause to the semen from the male, that is the way we would have to state it. But, in general, we must rather think that the cause resides in the matter [contributed by the female] and in the embryos being composed.

That is also why monstrosities of these sorts come to be altogether rarely in one-offspring-bearing animals, but more frequently in the many-offspring-bearing ones, and most of all in the birds, and among the birds most of all in the chickens; for this bird is many-offspring-bearing not only in generating often, like the pigeon kind, but also because it has many embryos at the same time and mates all year round. That is also why it lays many twin eggs; for the embryos grow together because they are near each other, as many fruits sometimes do. From these twin eggs, when the yolks are divided by the membrane, two separate chicks come to be having nothing extraordinary about them, but when the yolks are continuous, with nothing keeping them asunder, from these chicks that are monstrous come to be, having one body and head but four legs and four wings. This is because the upper parts come to be earlier and from the white, the nourishment for them being dispensed from the yolk, while the lower part develops later and its nourishment is one and indivisible.

A snake that is two-headed due to the same cause has also been observed; for this kind too is egg-laying and lays many eggs. Monstrosities, however, are rarer in their case due to the shape of the uterus; for because of its length, the large number of eggs are set in a row. With the bees and the wasps nothing of this sort occurs, because their offspring are in separate cells. But with chickens the contrary is the case, which makes it clear that we must consider the cause of these things to reside in the matter; for among the other animals too monstrosities occur more often in those that are many-offspring-bearing. That is why in the human being they are less common; for it is, for the most part, one-offspring-bearing and a bearer of complete offspring, since, even in the human beings, it is in places where the women bear more than one offspring at a time that monstrosities occur more often—for example, in Egypt. And in goats and sheep they are more common; for they are to a higher degree many-offspring-bearing. And it is still more common in the multi-split-footed animals; for these sorts of animals are many-offspring-bearing and do not bear complete offspring, as the dog does; for in many cases it gives birth to blind offspring.

Due to what cause this happens and due to what cause they are many-offspring-bearing must be stated later.[268] But they are predisposed by nature to bear monstrosities by their not generating offspring that, due to their incompleteness, are not similar [to their parents]. And the monstrosity too is among the offspring that are dissimilar to their parents.[269] That is why this coincident is a point of overlap in animals with this sort of nature. For it is in these too that the ones called "runts" most frequently come to be. And these have in a certain respect been affected in the way

268. 771[a]17–[b]14.
269. 767[b]5–6.

monstrosities have been. For there to be a deficiency or a surplus is a sort of monstrosity. For the monstrosity is among the things that are contrary to nature, not contrary to all nature, but the one that holds for the most part; for concerning the nature that is always and of necessity [the way it is] nothing comes to be contrary to nature, but rather it occurs among the things that, though they are, for the most part, generated in a certain way, admit of doing so in another way. Even in their case, though it occurs contrary to this order, yet, since it always does so non-randomly, [what comes to be] seems less a monstrosity because even what is contrary to nature is in a certain way in accord with nature, whenever the nature that is in accord with the form has not mastered the nature that is in accord with the matter. That is why people do not call things of this [runt] sort "monstrosities" any more than they do in the other cases in which something customarily comes to be, as in the case of fruits. For there is a vine that some people call "smoky," and if it bears black grapes they do not judge it a monstrosity because it is in the habit of doing this very often. The cause of this is that its nature is intermediate between white and black, so that the change is not from far away nor, as it were, contrary to nature; for it is not a change to another nature.

But in many-offspring-bearing animals these things occur because the multiple [embryos] impede each other's completion and generative movements.

One might raise a puzzle about many-offspring-bearing and having an excess of parts, and few-offspring- or one-offspring-bearing and having a deficiency of parts. For sometimes animals come to be having too many toes, while others have only one, and with the other parts it is the same way; for both an animal that has excess parts and one that is docked come to be. Some—both among the human beings and especially among the goats—even have two sex organs, one of a male and one of a female; for goats come to be that are called "hermaphrodites" because of having a female and a male sex organ—and a goat has even been known to have come to be with a horn on its leg.

Changes, deformations, and excesses also come about in the internal parts, by not possessing some of them, by possessing ones that have been docked, too many of them, or misplaced ones. No animal, indeed, has come to be without having a heart, but rather without having a spleen, or having two spleens, or one kidney; and none without having a liver, but without having a whole one—and all these in animals complete and alive. Found too are animals not having a gallbladder that naturally have one; others having more than one. Cases of their being misplaced are also known, the liver being on the left, the spleen on the right. And these have been seen in complete animals, as was just said. In ones being born, on the other hand, one sees much disorder of every sort. Those that depart a little from nature usually live; those that depart a lot, when what is contrary to nature lies in the parts that have control,[270] do not live.

270. $742^{a}32$–$^{b}3$.

The investigation concerning these things is whether we must consider the cause of one-offspring-bearing and having a deficiency of parts, and of having an excess of parts and many-offspring-bearing, to be the same, or not the same.

First, then, why some animals are many-offspring-bearing, while others are one-offspring-bearing, is something it would seem reasonable for someone to wonder at. For it is the largest of the animals that are one-offspring-bearing—for example, the elephant, the camel, the horse, and the solid-hoofed ones. Among these, some are larger than [all] the other animals, while others are very outstanding in size. The dog and the wolf, on the other hand, and pretty much all the multi-split-footed animals are many-offspring-bearing, even the small ones of these sorts—for example, the mouse kind. The cloven-hoofed animals are few-offspring-bearing, except for the pig, which is among the many-offspring-bearing ones. For it is reasonable that the larger ones be capable of generating more offspring and bear more seed. But the very thing that we wonder at is a cause not to wonder; for it is because of their size that they do not give birth to many offspring; for the nourishment in these sorts of animals is used up for the growth of the body, while in the smaller animals nature subtracts from the size and adds the excess to the spermatic residue. Further, it is necessary for the generating seed of a larger animal to be greater in quantity, and for that of smaller ones to be small in quantity. And though many small ones can come to be in the same [place], it is difficult for many large ones. And to those intermediate in size nature has assigned the intermediate [number].

Of there being some animals that are large, others smaller, others intermediate, we have previously stated the cause.[271] Some of the animals are one-offspring-bearing, others few-offspring-bearing, others many-offspring-bearing. For the most part, the solid-hoofed ones are one-offspring-bearing, the cloven-hoofed few-offspring-bearing, and the multi-split-footed many-offspring-bearing. The cause of this is that, for the most part, their sizes correspond to this difference. But it is not so in all cases; for it is the largeness and smallness of their bodies that is the cause of their being few-offspring-bearing and many-offspring-bearing, but not the kind's being solid-hoofed, cloven-hoofed, or multi-split-footed. Here is evidence of this: the elephant is the largest of animals, though it is multi-split-footed, and the camel, which is cloven-hoofed, is the largest of the remaining ones. And it is not only among the animals that walk but also among the ones that fly and swim that the large ones are few-offspring-bearing and the small ones many-offspring-bearing, due to the same cause. Similarly, it is not the largest plants that bear the most fruit.

Why the nature of some animals is many-offspring-bearing, others few-offspring-bearing, others one-offspring-bearing has been stated. As for the puzzle that has just now been stated, one might reasonably wonder at those that are many-offspring-bearing, since these sorts of animals are often seen to conceive after a single mating. But whether the seed of the male contributes to the matter of the embryo

271. Perhaps a reference to *PA* 686[b]29–32.

by becoming part of it and mixing with the seed of the female, or whether in fact it is not that way but, as we say, by bringing together and crafting the matter in the female, that is, the spermatic residue, just as the fig juice does the liquid in milk—due to what possible cause does it not complete [just] one animal having [the relevant] size, just as there, in the example, the fig juice is not separated in composing a certain quantity, but rather the more it is put into and the more it is, so much the greater is what is curdled?

To say that the places in the uterus draw the seed and because of this several offspring come to be, that is, because of the number of the places and because of the cotyledons not being one, is to say nothing; for often two [embryos] come to be in the same place in the uterus, and in the many-offspring-bearing animals, when the uterus is filled with embryos, they are seen to lie in a row. This is clear from dissections. But in fact, just as when animals are completing [their growth] there is a certain size for each, both in the direction of larger and in the direction of smaller, neither will any come to be that is larger or smaller than this, but rather it is within the intervening interval that there is an excess or deficiency in the size they get in relation to each other, and one becomes a bigger and another a smaller human being, or any other animal whatever—so too the spermatic matter from which [the embryo] comes to be is not so unlimited, either in the direction of more or in the direction of less, that it comes from some random quantity. Due to the cause stated, then, in the case of all the animals that emit more residue than is the starting-point for one animal, it is not possible that from all of it [only] one comes to be, but rather as many as is determined by the sizes that pertain; nor will the seed of the male or the capacity in the seed compose anything more or less than what is natural. Similarly, if the male emits more seed, or there are more capacities in the divided-up seed, the greatest possible amount of it will not produce anything bigger [than what is natural], but on the contrary will destroy [the spermatic matter in the female] by drying it up. For even fire does not heat up water more as it is itself increased; rather, there is a defining mark of the hotness, which once reached, if one increases the size of the fire, the water no longer becomes hotter, but instead evaporates more and more, and in the end disappears and dries up.

Since, then, it appears that the residue of the female and that from the male need (in all those where the males emit seed) to stand in some proportional relationship to each other, in the case of those animals that are many-offspring-bearing, the males at the outset emit [seed] capable, when divided into parts, of composing several embryos, while the female emits enough that several can come to be composed. (In the case of the milk example we stated it is not like that; for in the case of the heat of the seed what is composed is not only a certain quantity but also has a certain quality, while in the case of fig juice or rennet the quantity alone is involved.) Of many embryos coming to be, then, and not one continuous one, this is the cause in the many-offspring-bearing animals, that the embryo does not come to be from some random quantity, on the contrary, if there is too little or too much, there will not be

one; for there is a determinate limit to the capacity, what is affected, and the heat of what affects it.

Similarly, in the case of the large one-offspring-bearing animals it is not the case that many offspring come to be from much residue; for in them too it is from a certain quantity that a certain quantity gets worked up. They do not, then, emit a larger quantity of this sort of matter due to the cause stated. And what they do emit is just enough, in accord with nature, for one embryo to come to be from it. But if at some time more of it comes, then two come to be. That is also why such things seem to be more monstrous, because they occur contrary to what holds for the most part and what is usual.

The human being, however, plays a double game in all the modes of generation; for it is one-offspring-bearing, few-offspring-bearing, and many-offspring-bearing at times, but its nature is most of all one-offspring-bearing—because of the wetness and hotness of its body it is many-offspring-bearing (for the nature of seed is wet and hot), but because of its size it is few-offspring-bearing and one-offspring-bearing. And because of this it also happens that it is the only animal whose periods of pregnancy are irregular. For while in the others there is a single period, in the human beings there are several; for they are born at seven months, at ten months, and at the intermediate times; for even those of eight months do live, but less often.[272] The cause may be made out on the basis of what has just been said; it has been spoken about in the *Problems*.[273]

And about these issues, let things be determined in this way.

Of the excess of parts contrary to nature and the birth of twins the cause is the same. For already in the embryos the cause occurs, whenever it composes more matter than corresponds to the nature of the part; for then the result is that one part is larger than the others—a finger, hand, foot, or some other of the extremities or limbs—or else, if the embryo is divided, more parts come to be, as eddies do in rivers; for in these eddies too as the water is carried along and, having movement, collides with something, from the one [eddy] two compositions come to be that have the same movement. It happens in the same way in the case of the embryos as well. The [parts] are mostly attached near each other, although sometimes they are further away because of the movement occurring in the embryos, and especially because of the excess of matter being assigned to the place it was subtracted from, while retaining the form of that [part] from which it was [subtracted as] excess.

In some cases these sorts of things occur in such a way that the embryos have two sex organs, one male, the other female, but when such excess occurs, one part has control and the other lacks control, and is always made weak as regards nourishment, since it is contrary to nature, and is attached just as tumors are; for these too get nourishment, although they occur after birth, and are contrary to nature. If what is

272. *HA* 584[a]33–[b]12.

273. No such discussion is found in the extant †*Pr*.

doing the crafting has gained mastery, or is wholly mastered, two similar [sex organs] come to be. But should it in part master and in part be mastered, one is female, the other male; for it makes no difference whether we state the cause due to which one is female and another male in the case of the part or in the case of the whole.

And wherever a deficiency occurs in these sorts of parts, for example, in an extremity or certain of the other limbs, we must consider the cause to be the very same as when the whole embryo miscarries (and miscarriages of embryos occur frequently). **773^{a}1**

Outgrowths differ from many-offspring-bearing in the way stated, while monstrosities differ from these in that most of them are due to [embryos] growing together. In some cases, they also differ in this way if the [monstrosity occurs] in the larger and more controlling parts—for example, some have two spleens, or several kidneys. Further, the parts may change locations because of the movements being diverted and the matter changing places. We should consider the monstrosity to be one animal, or several growing together, by reference to the starting-point. For example, if the heart is a part of this sort, what has one heart is one animal, and the excess parts [mere] outgrowths, while those that have several hearts will be[, for example,] two animals, though grown together due to the junction of the embryos.

It often happens, even with many animals that do not seem to be deformed and are already completely developed, that some of their ducts have grown together, while others have been diverted. And, in fact, in some women the mouth of the uterus has been known to remain closed until the time for the menses and the subsequent pains. In some cases, they broke through spontaneously, in others due to doctors having cut the mouth open. And some cases have resulted in death if the breakthrough occurred by force or could not occur. And in some boys it happens that the end limit of the sex organ and the duct through which the residue from the bladder passes do not coincide, but the latter is underneath, which is also why they sit when they urinate, and since the testicles have been drawn up they seem from a distance to have a female and a male sex organ at the same time. And the duct for dry nourishment has also been known to grow closed in certain animals, both sheep and others, since in fact in Perinthus a cow came to be that passes fine-grained filtered nourishment through the bladder, and when its anus was cut open it quickly grew closed again, and they could not keep it open.

Being few-offspring-bearing and many-offspring-bearing, as well as outgrowths of excess parts, and further, monstrosities, have now been spoken about.

4.5
Superfetation

In some animals, superfetation does not occur at all, in others superfetation does occur, and among the superfetators, some are capable of bringing the embryos to birth, others are capable of doing so sometimes, sometimes not. The cause of not

being a superfetator is their being one-offspring-bearing. For the solid-hoofed animals and those larger than these do not superfetate; for because of their size the residue gets used up for the [one] embryo. For all these have large bodies, and of large animals the fetuses are large in proportion. That is why too the fetus of elephants is as big as a calf. The many-offspring-bearing animals do superfetate, because where there is more than one [fetus], one is a superfetation of the other.

Among these, the ones that are large, such as the human being, if the one mating occurs soon after the other, it brings the second embryo to birth; for cases of this sort have been observed to occur. The cause is that just stated; for even in a single act of sexual intercourse the seed emitted is more than enough, and when it is divided up it produces many offspring, one later than the other. But when the embryo has already [somewhat] grown and it so happens that mating occurs [again], superfetation sometimes takes place, although rarely, because the uterus generally closes up in women while they are pregnant. But if ever this does happen (and in fact it has been known to occur in the past), completion [of the second embryo] is impossible; instead, [such] embryos fall out in much the same condition as what are called "premature" births. For just as in the case of the one-offspring-bearing animals, because of their magnitude, all the residues go to the preexisting [embryo], so it is here too, except that there it is so from the outset, while here it is when the embryo has [somewhat] grown; for at that time they are in much the same condition as one-offspring-bearing animals. Similarly, because the human being is by nature many-offspring-bearing, and because there is something to spare both in the size of the uterus and the quantity of the residue (though not enough to bring a second embryo to birth), the only animals that admit of mating while pregnant are woman and mare, the first due to the cause just stated, the mare both because of the barrenness of its nature and because there is something to spare in the size of its uterus, which, though it has room for more than one, is too small to superfetate another complete one.

And the mare is by nature lecherous because it is affected in the same way as barren females; for the latter are of this sort because a [menstrual] purgation does not occur (which corresponds to ejaculation in males), and mares emit very little purgation. And in all the live-bearing animals the barren females are given to sexual activity because their condition is much the same as that of males when the seed has collected [in the testicles] but has not been secreted. For in females the purgation of the menses is an emission of seed; for the menses is seed that is unconcocted, as was said previously.[274] That is also why those women who lack self-control in relation to sexual intercourse of this sort, when they have borne many children, cease from their passionate excitement; for when the spermatic residue has been excreted, it no longer produces an appetite for sexual intercourse. Among the birds, the females are less lecherous than the males because they have the uterus up near the diaphragm, while with the males things are the contrary way; for their testicles are drawn up within

274. 726ᵇ30–727ª4.

them, so that if any such animal kind by nature produces a lot of seed, it is always in need of sexual intercourse. In the females, then, it is the coming down of the uterus, and in the males the drawing up of the testicles, that is favorable to mating.

Due to what cause, then, some animals do not superfetate at all, while others do superfetate but sometimes bring the embryos to birth and sometimes do not, and due to what cause some are lecherous, others not lecherous, has now been stated.

Some of the animals that superfetate are capable of bringing the embryos to birth even when much time elapses between the matings, those whose kind produces a lot of seed, do not have a large body, and are among the many-offspring-bearing animals; for because of their being many-offspring-bearing their uterus is roomy, because of producing a lot of seed they emit much residue for purgation, and because their body is not large, but the purgation exceeds by a large ratio the nourishment that goes to the embryo, they are capable both of composing the animals to a later point and of bringing them to birth. Further, the uterus in animals of this sort does not close up [during pregnancy] because of the spare residue for purgation. This has been known to happen even in the case of women; for in some of them the purgation occurs even through to the end of pregnancy. But in these it is contrary to nature (which is why it harms the embryo), while in these other animals it is in accord with nature; for their body is composed in this way from the start—for example, that of the hares; for this animal superfetates; for it is not one of the large animals, is many-offspring-bearing (for it is multi-split-footed, and the multi-split-footed ones are many-offspring-bearing), and produces a lot of seed. Their hairiness makes this clear; for the quantity of their hair is excessive; for it alone of the animals has hair under its feet and inside the jaws. And hairiness is a sign of a large quantity of residue, which is why, among the human beings too, the hairy ones are lecherous and produce more seed than smooth ones. As for the hare, it often has some embryos that are incomplete, but delivers others of its young complete. **$774^{b}1$**

4.6
Degrees of Completeness in Neonates

Among the live-bearing ones, some deliver animals that are incomplete, others animals that are complete; the solid-hoofed and the cloven-hoofed animals deliver complete ones, most of the multi-split-footed animals incomplete ones. The cause of this is that, for the most part, the solid-hoofed ones are one-offspring-bearing, the cloven-hoofed one-offspring-bearing or two-offspring-bearing, and it is easy to bring the few to birth. But of the multi-split-footed animals that give birth to incomplete offspring all are many-offspring-bearing. That is why, though they are capable of nourishing the embryos when they are young, once these embryos have grown somewhat and have attained some size, their bodies are incapable of nourishing them, and deliver them just as the larvae-generating animals do. And, in fact, some of them are

pretty much non-articulated when generated, as are the fox, the bear, the lion, and, in much the same way, some of the others. And pretty much all of them are blind—for example, not only the former ones but also, further, the dog, the wolf, and the *thôs*.[275] The pig alone is many-offspring-bearing and gives birth to complete offspring, and it alone overlaps [genera]; for it is many-offspring-bearing like the multi-split-footed animals, but is solid-hoofed and cloven-hoofed; for solid-hoofed pigs exist in certain places.[276] They are many-offspring-bearing, then, because the nourishment that goes to size [is diverted] to the secretion of spermatic residue (for considered as a solid-hoofed animal, the pig is not large in size), and at the same time—as if disputing the nature of the solid-hoofed ones—it is more often cloven-hoofed. Because of this, then, it is sometimes one-offspring-bearing, sometimes two-offspring-bearing, but most often many-offspring-bearing, and brings these to birth because of the good condition of its body; for it has sufficient and plentiful nourishment as rich soil does for plants.

Some of the birds too give birth to incomplete and blind young, the ones that are many-offspring-bearing, though not having large bodies themselves (for example, the crow, the jay, the sparrows, and the swallows) and those of the few-offspring-bearing ones that do not give birth to plentiful nourishment in the egg along with the young (for example, the wild pigeon, the turtledove, and the common pigeon). And because of this, if one puts out the eyes of swallows while they are still young, they heal again; for the birds are still developing when they are injured, not yet developed, which is why they grow and sprout from the start. And, in general, [a bird] is born prior to being complete, because of the inability [of the progenitors] to nourish it, and it is generated incomplete because of that priority. This is clear too in the case of seven-month children; for in some of them, because they are not complete, even the ducts—for example, of the ears and nostrils—are often not yet articulated, but become articulated as the children grow. And many such children live on.

In the human beings more males are born deformed than females, but in the other animals, not at all so. The cause is that in the human beings the male is much different from the female in the hotness of its nature, which is why male embryos move about more than female ones, and because of their movement they get more damaged; for what is young is prone to destruction because of its weakness. And it is due to this same cause too that, in women, female ones are not completed in a similar way to male ones, while in other animals they are completed in a similar way;[277] for in them the female in no way much lags behind the male, as in the case of women; for while within the matrix, the female takes more time to become disaggregated than the male does, once having emerged, everything gets completed earlier in females than in males—for example, puberty, prime of life, and old age; for females are weaker and

275. *HA* 507b17.
276. *HA* 499b11–13.
277. Lines a–c are added from the Latin and Arabic translations.

colder in nature, and we must suppose femaleness to be like a natural deformation. While it is within the mother, then, it gets disaggregated slowly because of its coldness (for disaggregation is concoction, it is heat that concocts, and what is hotter is easily concocted), but outside, because of its weakness, it quickly reaches its prime and old age; for all inferior things reach the end more quickly, and just as they do in works that are in accord with craft, so they do too in those composed due to nature. And due to the cause stated twins in the human beings are also less likely to survive if they are male and female, in other animals not at all so; for in the human beings it is contrary to nature for these to run an equal course, as their disaggregation does not occur in equal times; rather, it is necessary that the male be late or the female early. In the other animals, however, it is not contrary to nature.

A difference also exists between the human beings and other animals as regards their pregnancies; for the other [animals] are in a more thriving bodily condition most of the time, while most women feel discomfort during pregnancy. A cause of these things is also due to their mode of life; for because they are sedentary, they are filled with a greater quantity of residue, since in those nations in which the life of women involves hard work, pregnancy is not equally noticeable, and they give birth easily there, and wherever they are accustomed to hard work; for hard work uses up the residues, while in sedentary women a large quantity of such residues is present due to the absence of hard work and because no purgations occur during pregnancy—and so labor is painful. But hard work exercises their breath so that they are capable of holding it, and it is in this that the ease or difficulty of giving birth lies. **$775^{b}1$**

These things, then, as was just said, contribute to the difference in how other animals and women are affected, but the most important cause is that in some animals little purgation occurs, and in others it is not noticeable at all, while in women much more occurs than in [other] animals, so that when, due to pregnancy, its excretion does not occur it produces disturbance; for even if they are not pregnant, when the purgations do not occur, diseases result. And most women are more troubled when they first conceive; for while the embryo is capable of preventing the purgations, because of its smallness it does not use up the residue in any large quantity at first, but later on, when it takes its share, it eases the trouble. (In the other animals, however, because there is little [residue], it is proportional to the growth of their embryos, and as the residues that hinder growth get used up, their bodies are in better condition. And in the aquatic animals and the birds it is the same way.) But if by the time the embryos become big the mother's body is no longer in thriving condition, the cause is that the growth of the fetus needs more nourishment than is provided by the residue. In some few women, however, their bodily condition is better during pregnancy—these are the ones in whose bodies the amount of residues is small, so that they get used up along with the nourishment that goes to the embryo.

4.7
Molar Pregnancies

We must also speak about what is called a "mole," which occurs rarely in women, but this affection does occur in some pregnant ones. For they give birth to what they call a "mole." For it has been known to happen to a certain woman who had had sexual intercourse with a man, and supposed that she had conceived, that at first the bulk of her abdomen grew, and all the other things occurred in accord with reason, yet when it was the time for giving birth, she neither gave birth to a child nor did her bulk become smaller, but instead she continued in this condition for three or four years until dysentery came on, endangering her life, and she gave birth to the fleshy mass they call a "mole." In some cases too, this affection continues into old age and lasts until death. The masses that emerge in cases of this sort become so hard that they can scarcely be cut in two even with iron. (The cause of this affection has been spoken about in the *Problems*;[278] for the embryo is affected in precisely the same way in the **776ᵃ1** uterus as parboiled things are in cases of boiling, and not because of the hotness, as some people say, but rather because of the weakness of hotness; for the nature seems to be weak and not capable of completing or putting a limit to the process of generation. That is why too the mole remains in them into old age or for a long time; for it has neither the nature of something completed nor of an altogether foreign body.) Of its hardness, in fact, non-concoction is the cause; for parboiling too is a sort of non-concoction.

The puzzle it involves is that of why exactly this does not occur in other animals, unless it does but has altogether escaped notice. We must consider the cause to be that woman alone among the animals is subject to troubles of the uterus, that is, as regards the purgations, she is excessively productive, and is incapable of concocting these. When, then, the embryo is composed of a wet secretion that is difficult to concoct, what is called a "mole" occurs in these women—reasonably most of all in these or in these alone.

4.8
Milk

Milk occurs in all females that are internally live-bearing as something useful at the time of giving birth; for nature has made it in animals for the sake of nourishment, the one they get externally, so that it is neither at all deficient nor at all excessive in this time period. And this is precisely what we see happening unless something contrary to nature occurs. In the other animals, because there is a single period of pregnancy, the time for the concoction of milk is in all cases related to it. But in the

278. No such discussion is found in the extant †*Pr.*

human beings, since there are several periods, it is necessary for it to be present at the first one; that is why milk is useless before the seventh month in women, and then at that point becomes useful. But it also reasonably happens, due to an of-necessity cause, that it is concocted [only] in the final stages; for at first the secretion of this sort of residue is used up for the generation of the fetuses. Of all [secretions] nourishment is the sweetest and most concocted, so that when a capacity of this sort is subtracted it is necessary for what remains to be salty and ill-flavored. But when embryos are becoming complete, the surplus residue is greater (for less of it gets used up) and sweeter, since the well-concocted part is not being subtracted to the same extent. For it is no longer going toward the molding of the fetus but toward its small growth, as if the fetus were halting due to [attaining] its end. For there is a sort of completion even of an embryo. That is why it emerges and changes its process of generation, as now having the things that are its own, and no longer getting the things that are not its own, which is the time in which milk becomes useful.

It is in the upper part and the breasts that milk collects because of the order of composition from the starting-point. For what is above the diaphragm is the controlling part of the animal, while the one below is for the nourishment and the residue, in order that those animals that move by walking have within them a self-sufficiency of nourishment for changing from place to place. From the former too the spermatic residue is secreted, due to the cause stated in the starting accounts.[279] But both the residue of the male and the menses of the female are of a sanguineous nature, and the starting-point of this and of the blood vessels is the heart. And it is situated in these parts. That is why it is first there that it is necessary for the change in these residues to become noticeable. It is why indeed the voices both of males and of females change when they start to bear seed (for the starting-point of the voice is there, and itself becomes altered when what moves it becomes altered[280]). And the parts around the breasts become raised up in an obvious way even in males, but more so in females; for because the excretion downward becomes great the place of the breasts becomes empty and spongy in them—and likewise in the other animals that have their breasts down below.

The change both in the voice and in the parts around the breasts even in the other animals becomes noticeable to those who have experience with each kind, but the difference is greatest in the case of the human beings. The cause is that the production of residue in proportion to size among females is greatest in these females, and among males in these males—in the former the menses, in the latter emission of seed.[281] When, then, the fetus does not take up this sort of secretion, yet prevents it from getting outside, it is necessary for all the residue to collect in those empty places that are situated on the same ducts. And in each [kind of animal] the place

279. $738^{b}15–18$, $747^{a}19–20$.

280. $787^{b}19–788^{a}16$.

281. Reading ταῖς μὲν τὴν τῶν καταμηνίων, τοῖς δὲ τὴν τοῦ σπέρματος πρόεσιν.

of the breasts is of this sort due to both causes, becoming of this sort both for the sake of the better and of necessity. It is there, then, that the concocted nourishment for [newborn] animals is at this time composed. And because of its concoction, it is possible to take either the cause stated,[282] or even the contrary; for it is also reasonable for the fetus, since it is larger, to take up more nourishment, so that the surplus is less around this time—and less is concocted more quickly.

That milk has the same nature as the secretion from which each animal comes to be is clear, and was also stated previously.[283] For the same matter both nourishes and is what the nature composes [the animal] from in the process of generation. This is the sanguineous liquid in the blooded animals. For milk is blood that is concocted but not destroyed. As for Empedocles, either he has interpreted things incorrectly or employed a bad metaphor when he wrote in his poem that milk is "a white pus that comes into existence on the tenth day of the eighth month."[284] For putrefaction and concoction are contrary, and pus is a certain sort of putrefaction, while milk is among the concocted things.

When women are suckling children, the purgations, when in accord with nature, do not occur, nor do women conceive when they are suckling. And if they do conceive, the milk dries up because the nature of the milk is the same as that of the menses. And nature is not capable of being so productive as to play a double game; rather, if the secretion occurs in one direction it is necessary for it to fail in the other, unless something comes about that is forced and contrary to what holds for the most part.

The process of generation of animals has also been well distinguished into periods of time; for when the nourishment coming through the umbilical cord is no longer sufficient for the embryo, because of its size, at the same time the milk becomes useful for what becomes its nourishment. And when the nourishment does not enter through the umbilical cord, these blood vessels collapse, which what is called the "umbilical cord" surrounds like a membrane. And because of these things and at this time the [offspring's] exit to the outside results.

4.9
Why Animals Are Born Head First

Head first is the process of generation that is in accord with nature for all animals, because the parts above the umbilical cord are larger than those below. Being attached to it, then, as to the beam of a balance, they incline toward the weightier side. And the larger parts have more weight.

282. 776ᵃ25.
283. 739ᵇ25–26.
284. B68 DK.

4.10
Periods of Pregnancy

The periods of pregnancy for each of the animals are, for the most part, determined in accord with their lives; for it is reasonable for the processes of generation for the longer-lived ones to be longer. Nonetheless, this is not the cause, although it is what for the most part happens; for though the larger and more complete of the blooded animals do also live a long time, nonetheless the larger ones are not all longer-lived. **777^{b}1** In fact, the human being is the longest-lived of them all except the elephant, so far as we have any reliable experience. And yet the human kind is smaller than that of those with long hair in their tails, and many others. The cause of long life in any sort of animal is its being blended in much the same way as the surrounding air, and because of certain other coincidents of its nature that we will speak about later on.[285] But for the periods of pregnancy the cause is the size of the things being generated; for it is not easy for large compositions to reach their completion in a short time, whether they are animals or (one might almost say) anything else whatever. That is why the horses and animals of the same kind as these, although living a shorter time [than the human beings] are pregnant a longer time; for in the former the birth is in a year, but in the latter in ten months at the most. And due to the same cause, in the case of the elephants the birth is in a long period of time; for their pregnancy lasts two years because of their excessive size.

It is reasonable that in all animals the duration of pregnancy, of the process of generation, and of lifespan tend in accord with nature to be measured out by periods. By a "period" I mean a day, a night, a month, a year, and the greater periods of time measured by these; further, the periods of the moon. The periods of the moon are full moon, [completely] waning moon, and the dichotomies of the intermediate times; for it is in accord with these that it is in connection with the sun; for the month is a period common to both. And the moon for its part is a starting-point because of its connection with the sun and its participation in the sun's light; for it becomes like another sun, a lesser one.

That is why it contributes to all processes of coming to be and processes of completing. For hotness and coldness, up to a certain proportion, produce the processes of coming to be, and afterward those of passing away. And it is the movements of these stars that fix the limit, both the starting-point and the end-point, of these processes. For just as we see the sea, and all of what is of the nature of liquids, to be settling or changing in accord with the movement or rest of the winds, and the air and the winds in accord with the period of the sun and the moon, so too the things that grow from these or are in these necessarily follow along; for it is in accord with reason for the periods of things that are more lacking in control to follow along with **778^{a}1** those of the things that have more control. For a wind too has a sort of life and a

285. *Long*. $466^{a}17$–$467^{a}5$.

coming to be and passing away.[286] And of the revolutions of these stars there may perhaps be other starting-points.

Nature, then, tends to measure comings to be and endings by the number of these revolutions, but cannot bring this about in an exact way because of the indefiniteness of matter, and because many starting-points exist that impede their comings to be and passings away from being in accord with nature, and often cause things to happen contrary to nature.

The internal [to the mother] nourishment of animals and the external have now been spoken about, both about each separately and about all in common.

BOOK 5

5.1
Affections of Animals and Their Parts; Sleep; Color of Eyes; Sharpness of Sight

We must now get a theoretical grasp on the affections by which the parts of animals differ. I mean the following sorts of affections of the parts: blueness and blackness of eyes, height and depth of voice, and differences of color, whether of the body[287] and the hair or of the feathers. Among these sorts of affections, some are found existing throughout a whole kind, others in a random manner—for example, this happens most of all in the case of the human beings. Further, in connection with the changes of age, some belong alike to all animals, while others do so in contrary ways, as in what has to do with the voice and the color of hair; for some do not go noticeably gray toward old age, while the human being is more affected by this than any of the other animals. Also, some of these affections follow along immediately after birth, while others become clear as age advances, or in old age.

As regards these affections and all the others of these sorts, however, we must no longer consider the mode of cause to be the same [as previously]. For none of the things that are not works of nature, whether common or special to a given kind, either exists or comes to be for the sake of something. For though the eye is for the sake of something, it is not blue for the sake of anything, unless this affection is special to the kind. Nor, in some cases, does the affection lead to the account of the substance, but rather, as coming of necessity, one must refer to the matter and the
778[b]1 moving starting-point as the causes. For just as was said at the start in the first accounts,[288] it is not because each thing comes to be of a certain sort that it is of a certain sort, when the things are ordered and determined works of nature, but rather

286. *GC* 318[b]29–33, *Mete*. 360[a]17–[b]26.
287. Reading ἢ σώματος.
288. *PA* 1, especially 640[a]3–[b]4.

it is because they are of this sort that they come to be of this sort; for the coming to be follows along with the substance and is for the sake of the substance, and not it for the sake of the coming to be. (The ancient natural scientists, however, thought the contrary to be so. The cause of this is that they did not see that the causes were many, but saw only that of the matter and that of the movement—and these indistinctly. But to that of the account and that of the end they gave no consideration.[289])

Although each of the relevant things, then, is for the sake of something, it is generated at this point due to this cause and due to the remaining ones, which are present in the account of each thing, either as being for-the-sake-of-something or as being for-the-sake-of-which. On the other hand, for things not of this sort, but of which there is a process of generation, at this point the cause must be sought in the movement and in the process of generation, on the supposition that it is in the process of composition itself that they acquire what is different about them. For though an animal will of necessity have an eye (for it is hypothesized as being an animal of this sort), and of necessity an eye of this sort, the necessity is not of the same sort, but is a different mode [of necessity], that the animal is naturally such as to affect in this sort of way or to be affected in this sort of way.

Having drawn these distinctions let us speak about the things that come next in order. First, then, in the case of all animals, when the young are born, especially those that are born incomplete, they are in the habit of sleeping, because inside the mother too, when they first acquire perception, they are continually asleep. —But there is a puzzle about the start of the process of generation as to whether wakefulness belongs to animals first or sleep does. For because it is evident that as they grow older they become more awake, it is reasonable that the contrary belongs to them at the start of the process of generation: sleep. Further, because the change from not being to being takes place through the intermediate, and sleep seems to be in nature among the things of this sort, being, as it were, a boundary between living and not living: a sleeper neither fully is not nor fully is. For living most of all belongs to being awake, because of perception. On the other side, if it is necessary for an animal to have perception, and if the time it is first an animal is when perception first takes place, then we must consider its condition at the start to be not sleep but something resembling sleep, a condition of the very sort that the plant kind is also in; for at this time animals too are living the life of a plant. But for sleep to belong to plants is impossible; **779^{a}1** for there is no sleep from which it is impossible to awake, and from the affection of plants that is the analog of sleep it is impossible to awake. —It is necessary in any case for these animals to sleep most of the time because the growth and the heaviness lie in the upper places (we have said elsewhere[290] that the cause of sleep is of this sort). Nonetheless, it is evident that they wake up even in the uterus (this is clear in dissections and in the egg-laying animals), and then immediately fall asleep and are

289. *Met*. $988^{a}18$–$^{b}16$, $993^{a}11$–17.
290. *Somn*. $456^{b}17$–28.

weighed down again. That is why when they have emerged [from the mother] too, they spend most of their time asleep.

Also, when they are awake, infants do not laugh, but while asleep they both cry and laugh. For perceptions occur in animals even when they sleep, not only in what are called "dreams," but also outside dreams, as in the case of those who get up and do many things without dreaming. For there are some people who get up while sleeping and walk about, seeing just like those who are awake. For perception of what is happening occurs in these, though they are not awake, yet not as a dream does. But infants, it seems, as if not knowing how to be awake, because of being accustomed to it, perceive and live in their sleep. But as time goes on and the growth changes over to the lower part, they at this point wake up more and spend most of their time this way. At first, they are more continually asleep than the other animals; for they are born more incomplete than any other complete-at-birth animal and having growth most of all in the upper part of the body.

The eyes of all children are bluish immediately after birth, but later on they change to what is going to be the natural one for them. But in the case of the other animals this does not noticeably occur. The cause of this is that the eyes of other animals are more of one color—for example, cows are dark-eyed, the eye of all sheep is pale gray, of others again the whole kind is bluish-gray or blue, and some are greenish,[291] like the majority of the goat kind itself. The eyes of the human beings, on the other hand, are of many colors; for they are blue, bluish-gray, or dark in some cases, and others are greenish. So, in the case of the other animals, just as the individuals do not differ from each other in this way, they do not differ from themselves [at different times] either; for they are not of a nature to have eyes of more than one color. But, of the other animals, it is most of all the horse that has eyes of many colors; for some of them in fact have eyes of different colors.[292] None of the other animals is noticeably affected in this way, although some human beings do have eyes of different colors.

We must think the following a sufficient cause of the eyes of the other animals, young or old, not noticeably changing, but of this occurring in the case of infants: in the former, this part is of one color, while in the latter it is of more than one color. On the other hand, of their being bluish and not having some other color, the cause is that the parts of young infants are weaker [than those of adults], and blueness is a sort of weakness.[293]

We must, however, get a universal grasp, as regards the differences in eyes, on the cause due to which some are blue, some grayish-blue, some greenish, and some dark. To suppose that the blue are fiery, as Empedocles says, while the dark contain more water than fire, and that because of this blue ones do not see sharply in the daytime, due to their deficiency of water, while the others do not do so at night, due to their

291. Literally, "like those of a goat."
292. Literally, "have one eye that is blue."
293. 779b21–34.

deficiency of fire, is not to state things correctly, if indeed [the organ of] sight consists in all cases not of fire but of water. Further, it is also possible to assign the cause for their colors in another way. Indeed, if it is as we stated previously in *De Sensu*, and prior to that in *De Anima*,[294] that this organ of perception is composed of water (and is composed of water and not of air or fire due to the specified cause), then this must be supposed to be the cause of [the eye colors] mentioned. For some eyes contain too much liquid, others too little, to be proportional to the movement, others the proportional amount.[295] Those, then, that contain too much liquid are dark because a large quantity of liquid is not easy to see through, while those that contain little are blue, as is also evident in the case of the sea; for the part of it that is easy to see through appears blue, the less so pale-gray, and the part that is not determined because of its depth appears black or dark-blue. As for the eyes intermediate between these, they differ at this point by the more and the less.

And the same cause, one must suppose, is also the cause of blue eyes not being as sharp-sighted in daytime, dark eyes at night. For blue ones, because of the small amount of liquid, are—insofar as they are liquid, that is, transparent—moved too much by the light and by visible objects. And seeing is the movement of this part insofar as it is transparent, but not insofar as it is liquid. Dark eyes, on the other hand, because of their large quantity of liquid, are moved less. For the light is weaker by night, and at the same time indeed liquid, in general, becomes more difficult to move in the night. The eye itself, then, must neither not be moved at all nor, insofar as it is transparent, be moved too much. For the stronger movement knocks aside the weaker one. That is why on changing from [looking at] strong colors people do not see, or on going out of the sun into the dark; for being strong, the movement preexisting in the eye hinders the one coming from outside—and, in general, neither strong nor weak sight is capable of seeing bright things because the liquid is affected and moved too much.

This is made clear too by infirmities of each sort of sight. For glaucoma occurs more often in those who are blue-eyed, what is called "night-blindness" in those who are dark-eyed. Glaucoma for its part is a sort of dryness of the eyes, which is why it occurs more in those who are getting old; for like the rest of the body these parts too become dry toward old age. Night-blindness, by contrast, is an excess of liquidity, which is why it occurs more often in the young; for the brain of these is more liquid. The one that is intermediate between little and much liquid is the best sight; for it is neither so small that it gets disturbed and hinders the movement of the colors, nor so large in quantity that it is made difficult to move.

But it is not only those stated that are causes of dullness or sharpness of sight, but also the nature of the skin on what is called the "eye-jelly"; for this must be

294. *Sens.* 2, *DA* $425^{a}3$–6.
295. $780^{a}1$–7.

transparent, and it is necessary for something of this sort to be fine-grained, white,[296] and even: fine-grained, in order that movement from outside may pass straight through; even, in order that its wrinkling not produce a shadow (for it is also because of this that old people do not have sharp sight—for like the rest of the skin that of the eye also becomes wrinkled and coarse-grained in old age); white, because black is not transparent—for this is what black is, the non-transparent. That is why even lanterns cannot give light if they are made of black skin.

In old age and during the diseases in question, then, these are the causes due to which sight is not sharp; but the eyes of children appear blue at first, because of the small quantity of their liquid.

And eyes of different colors come about especially in the human beings and horses due to the same cause as the one due to which the human being alone turns gray, and among the other animals the horse alone has hair that whitens noticeably in old age. For grayness is a sort of weakness and non-concoction of the liquid in the brain, as is blueness [of the eyes]; for very fine-grained and very coarse-grained liquid have the same capacity, the one as too little liquid, the other as too much liquid. When, then, the nature is incapable of producing an even result, whether by similarly concocting, or not concocting, the liquid in both eyes, but instead concocts the one and not the other, eyes of different colors come about.

The cause of some animals being sharp-sighted, and others not, is of two modes. For sharp is said of things in pretty much two ways (and this is the same way in hearing and smelling). For something is said to see sharply in one way when it is capable of seeing what is far away, in another way when it is capable of distinctly perceiving the differences in the things being seen. And these capacities do not occur together in the same individuals. In fact, the same individual, if he shades his eyes with his hand or looks through a tube, in no way discerns the differences in colors either more or less well, but he does see further. At any rate, from pits and wells people sometimes see even the stars.

So if any of the animals has brows projecting out a lot above its eyes, but the liquid in the eye-jelly is not pure or proportional to the movement from outside, and the skin on its surface is not fine-grained, this animal will not discern the differences in colors in an exact way, but it will be capable of seeing further better than those having their liquid and its covering pure, but having no brows at all projecting over the eyes. For of being sharp in this way, so as to distinctly perceive the differences in colors, it is in the eye itself that the cause lies; for just as on a pure [white] cloak even small stains are clearly visible, so in a pure organ of sight even small movements are clear and produce perception.

But of seeing things far away and of the movements coming to the eyes from objects far away, the position of the eyes is the cause; for animals with prominent eyes do not see well from far away, while those with eyes situated inside, in a cavity, are

296. I.e., clear.

able to see things at a distance because the movement is not dispersed into the open but comes straight to the eye. For it makes no difference whether we say, as some do,[297] that seeing is due to [the ray of] sight going out [from the eye] (for if there is nothing projecting over the eyes, it is necessary for the ray of sight to be dispersed, for less of it to fall on the things being seen, and for the ones far away to be seen less well) or that seeing is due to the movement coming from the things being seen. For in this case likewise, it is necessary for the sight to see due to movement. Things far away, then, would be seen best if there were a sort of continuous tube straight from the organ of sight to the thing being seen; for then the movement from visible objects would not be dispersed; otherwise, the further the tube extends, the more exact it is necessary for the seeing of faraway things to be. **781ᵃ1**

Let these, then, be the causes of the difference in eyes.

5.2
Sharpness of Smell and Hearing

It is the same way too as regards hearing and smell; for in one way hearing and smelling exactly is perceiving all the differences in the underlying perceptible objects and perceiving them all as well as possible, and, in another way, it is hearing and smelling from far away. Of discerning the differences correctly, then, the perceptual organ is the cause, as in the case of sight, depending on whether it itself and the membrane around it are pure.

For the ducts of all the perceptual organs, as was said previously in *De Sensu*,[298] run to the heart, or to its analog in animals that have no heart. That of hearing, then, since the perceptual organ is composed of air, comes to an end where the innate breath produces in some animals the beating of the heart and in others breathing.[299] It is because of this too that learning from what is said comes about in such a way that we echo what we have heard; for in these cases the movement that entered through the perceptual organ is of the sort that occurs again, since it is, as it were, of one and the same stamp as the movement that comes about because of the voice, so that one says what one heard. Also, people hear less well while yawning or exhaling than when inhaling, because the starting-point of the perceptual organ of hearing is situated near the breathing part[300] and is shaken and moved at the same time as the instrument[301] moves the breath; for while moving it, the instrument is itself moved. (And in wet seasons and blends [of the surrounding air] the affection is the same.) The ears too

297. Empedocles (*Sens*. 437ᵇ26–438ᵃ2), Plato, *Timaeus* 45b–46c, 67e–68b.
298. Not in our *De Sensu*. See *Juv*. 469ᵃ10–16.
299. Secluding καὶ εἰσπνοήν.
300. Presumably, the lungs.
301. I.e., the perceptual organ.

seem to be filled with breath because of being a neighbor, due to the starting-point, **781[b]1** of the breathing place.[302]

Exactness in discerning the differences of sounds and smells, then, depends on the purity of the perceptual organ and of the membrane on its surface; for then all the movements are distinguished in their cases too, as in the case of sight.

Perception and non-perception from far away also occur in the same way as in the case of sight. For animals that have, as it were, passages a long way in front of the organs of perception that pass through the relevant parts are the ones capable of perceiving from far away. That is why all animals whose nostrils are long, like Laconian hounds,[303] are sharp-scented; for since the organ of perception is high up, movements from far away are not broken up but go straight through, which is just what happens when we shade our eyes with our hands. It is likewise too in the case of those animals whose ears are long and jut far out like the eaves of a house, of the sort some four-footed animals have, and within which the helical passage is long; for these too catch the movement from afar and deliver it to the organ of perception.

Among animals in proportion to their size, exactness of the perceptual modalities from far away is possessed (one might almost say) least in the human being, but as regards differences, he is the most capable of all of perceiving them well. The cause is that the organ of perception is pure, that is, least earthen and body-like, and by nature, among animals with respect to size, man has the finest-grained skin.[304]

In matters concerning the seal too, nature has produced things in a reasonable way; for although it is a live-bearing four-footed animal it has no ears, but ducts alone. The cause of this is that its life is spent in a liquid. For the ears are a part added to the ducts to preserve the movement of the air from far away. They are of no use to it, then, but rather would even produce the contrary result by receiving a quantity of water into itself.

Seeing, hearing, and smelling have now been spoken about.

5.3
Hair (1)

As for various sorts of hair, the human beings differ in this themselves in accord with their times of life, and also from whatever kinds of other animals have hair. And those that have it are pretty much all the internally live-bearing ones; for even the spiny ones among these must be considered as having a form of hair—for example, the spines of hedgehogs and of any other of this sort that is among the live-bearing ones.

302. Reading τῇ ἀρχῇ τοῦ πνευματικοῦ τόπου.
303. *HA* 6.20.
304. The fine-grainedness of human skin presumably carries over to the membrane on the surface of this organ (781[b]3–4).

Hairs differ with respect to hardness and softness, length and shortness, straightness and curliness, abundance and sparseness, and in addition to these, with respect to their colors, whiteness and blackness, and the ones intermediate between these. In the case of these differences animals also differ in accord with their times of life, in their youth and in a more advanced age. This is especially noticeable in the case of the human beings; for in fact the hair gets coarser as age advances, and some go bald in the front of the head. Certainly, when they are children, they do not go bald, nor do women, but men do so by the time they begin to age. Also, the human beings go gray on the head as they grow old, while this (one might almost say) never noticeably occurs in any of the other animals; among the others, the horse does so most. Also, though the human beings go bald on the front of their head, they go gray on the temples first; no one goes bald, however, on these or on the back of the head. As for those animals that do not have hair but its analog, for example, the birds have feathers, and the fish kind have scales, in them too some of these sorts of affections come about, in accord with the same account. **782[a]1**

What nature has produced the kind of hair for the sake of in animals has been spoken about previously in the causes pertaining to the parts of animals.[305] But to make clear due to what preexisting things and what necessities each of these kinds occurs belongs to the present methodical inquiry.

Of hair being coarse or fine, then, the principal cause is the skin; for in some animals it is coarse-grained, in others fine-grained, and in some open-textured, in others dense. Further, a contributing cause is the difference of the included liquid; for in some it is oily, in others watery. For, in general, the underlying nature of the skin is earthen; for, being on the surface, it becomes solid and earthen as the liquid evaporates. But both hair and its analog come not from the flesh but from the skin, when the liquid evaporates and is exhaled in them. That is why coarse hair comes from coarse-grained skin, fine hair from fine-grained skin. If, then, the skin is more open-textured and more coarse-grained, the hair is coarse because of the large quantity of earthen material and because of the large size of the ducts [or pores], while if it is denser, they are fine because of the narrowness of the pores. Further, if the wet secretion is watery it dries up more quickly and the hairs do not get large in size, but if it is oily, the contrary occurs; for what is oily does not easily get dry.[306] **782[b]1**

That is why animals with more coarse-grained skin generally have hair that is coarser. Nonetheless, the ones with skin that is most coarse-grained do not have hair that is coarser [than others with such skin], due to the causes stated—for example, the pig kind in relation to the cow kind, the elephant kind, and many others. And due to the same cause too the hair in the human beings is most coarse on the head; for the skin on it is the most coarse-grained and lies over a very great quantity of liquid, and furthermore is very open-textured.

305. *PA* $658^{a}18–19$.
306. *Mete*. $383^{b}33–384^{a}2$.

The cause of the hair being long or short[307] is the evaporating liquid not being [or being] easily dried up. And of its not being easily dried up there are two causes: its quantity and its quality; for if the liquid is large in amount, it does not dry up easily, nor if it is oily. And because of this, in the human beings the hair coming from the head is longest; for the brain, being wet and cold, provides an abundance of liquid.

Straight hair and curly hair are due to the exhalation in the hair; for if it is smoky, it is hot and dry and makes the hair curly. For the hair gets bent due to being spatially moved with two spatial movements; for the earthen [dry] part spatially moves downward, the hot upward. And being easily bent because of its weakness, it gets twisted. And this is what curliness of the hair is. It is possible, then, to grasp the cause in this way, but it is also possible that, because of containing little liquid and much earthen material, it gets dried due to the surrounding air and curls up. For what is straight becomes bent if its liquid evaporates and it shrinks up like hair burning on a fire, implying that curliness is a contraction because of a deficiency of liquid due to the surrounding heat. A sign of this is the fact that curly hair is harder than straight; for a dry thing is hard. And those animals that have a lot of liquid are straight-haired; for the liquid advances in them as a stream, not in drops. And that is why the Scythians on the Black Sea and the Thracians are straight-haired; for both they themselves and the air surrounding them are wet, while the Ethiopians and those in hot countries are
783ᵃ1 curly-haired; for their brains and the surrounding air are dry.

Some of the animals with coarse-grained skin, however, have fine hair, due to the cause stated; for the finer the ducts [or pores] are, the finer it is necessary for the hair to be. That is why the sheep kind has such hair; for wool is a large number of hairs.

And there are some animals whose hair, though soft, is less fine—for example, what happens to the hare kind compared to that of the sheep. For the hair of such animals is on the surface of the skin[, not deeply rooted in it]. That is why it is not long but is much the same as the scrapings from linen cloths; for these too have no length, but are soft and cannot be used for weaving.

Sheep in cold climates are affected in the contrary way to the human beings; for while the Scythians are soft-haired, Sarmatian sheep are hard-haired. The cause of this is the same as in the case of all wild beasts. For the cold hardens and solidifies by drying; for as the heat is squeezed out, the liquid evaporates with it, and both the hair and the skin become earthen and hard. The cause in the case of wild beasts is their outdoor life, while in the others it is the place being of the sort it is. A sign of this is also what happens in the case of sea urchins that are used to treat stranguries.[308] For these too, though small themselves, have long, hard spines due to the fact that the sea they are in is cold because of its depth (for they are found at sixty fathoms and even more). The spines are long, because the growth of the body is diverted to them (for being animals that are low in heat, and so not concocting the nourishment very

307. Reading ἢ βραχείας.
308. *HA* 530ᵇ9–10.

much, they contain a lot of residue, and the spines, the hair, and things of this sort come to be from residue), while they are hard and petrified because of the cold and its solidifying effect. In the same way plants too are harder, earthier, and more petrified in north-facing or windy locations than in south-facing or sheltered ones; for they all get more chilled and their liquid evaporates.

Something is hardened, then, both by heat and by cold; for the liquid is evaporated due to both—intrinsically by heat, coincidentally by cold (for the liquid goes out along with the heat;[309] for there is no liquid without heat). But while cold not only hardens but condenses [things], heat makes them more open-textured. **$783^{b}1$**

Due to the same cause, as animals grow older, the hair becomes harder in those that have hair, and the feathers and the scales in the feathered and the soft-scaled ones. For their skins become harder and more coarse-grained as they get older; for they become dry, and old age (*gêras*), in keeping with its name, is earthen (*geêron*) because the heat is failing and the liquid along with it.

Most of all the animals, the human beings go noticeably bald, although an affection of this sort is something universal; for among the plants too, some are evergreen, others deciduous, and among the birds, the ones that go into hiding shed their feathers. Baldness in the case of the human beings who happen to go bald is an affection of this sort; for a partial shedding of leaves occurs in all the plants, and of feathers and hair in those that have them, but it is when this affection comes about in all these at once that it gets the names just mentioned; for then something is said to go bald, shed its leaves, or molt. The cause of the affection is a deficiency of hot liquid, and the oily ones among the liquids are most of all of this sort. That is why among the plants the oily ones are more evergreen. (But the cause of this must be spoken about elsewhere;[310] for there are in fact other contributing causes of this affection in these.) And it is in winter that the affection occurs in plants (for this change of season has more control than time of life), and in animals that go into hiding (for these too are in nature less hot and wet than the human beings). The human beings, on the other hand, pass through winter and summer in correspondence with their ages.

That is why, before the time of sexual intercourse, no one becomes bald; at that time, baldness appears in those whose nature is more lecherous. For by nature the brain is the coldest part of the body, and sexual intercourse makes one cold; for it is in fact the secretion of pure natural heat. Quite reasonably, then, the brain feels the effect of it first; for when things are weak and in poor condition, small causes shift the balance. So if one reckons up that the brain itself is low in heat, further, that it is necessary for the skin around it to be more so, and for the nature of the hair to be more so than the skin, inasmuch as they are farthest away, it would seem reasonable for it to happen to those with much seed that they go bald around this time of life.

309. *Mete*. $379^{a}23–24$.
310. In the lost treatise on plants ($716^{a}1$, $731^{a}29–30$).

And it is due to the same cause too that the front part of the head alone goes bald
784ᵃ1 and, among the animals, in the human beings alone: the front part, because the brain is there; alone among the animals, because the human being has much the largest and wettest brain. And women do not go bald because their nature is much the same as
5 that of children; for both are non-productive of spermatic secretion. Also, eunuchs do not become bald because they change to the female condition. And the hair that comes later in life, eunuchs either do not grow it or they lose it if they happen to, except for pubic hair. Women, in fact, either do not have it or it grows in the pubic
10 area. This deformation is a change from the male condition to the female.

As for the animals that go into hiding becoming hairy again and leaf-shedding plants growing leaves again, but in cases of baldness the hair not growing back again, the cause is that for the former the seasons of the year are the turning-points of their body more so [than in the human beings], so that since these seasons change, they
15 change with them by growing and losing feathers or hair, and the plants their leaves. In the case of the human beings, on the other hand, winter, summer, spring, and fall correspond to their ages, so that since the times of life do not change, neither do the
20 affections change that are due to these, although the cause is similar.

And [color aside] the other affections of the hair have now been spoken about.

5.4
Hair (2)

The cause of their colors in the other animals, and of their being single-colored or many-colored, is the nature of the skin. But in the human beings it is not the cause,
25 except of their hair going gray, not due to old age, but due to disease; for in what is called "white sickness" the hair becomes white, while if the hair is white because of old age, whiteness in the skin does not follow along. The cause is that the hair grows from the skin. If the skin from which they grow is diseased and white, then, the
30 hair is diseased along with it, and the disease of hair is grayness. But the grayness of hair that is due to time of life comes about due to weakness and deficiency of heat; for every time of life shifts the balance of the body's decline, in old age toward cold; for old age is cold and dry.

We must understand, however, that the nourishment reaching each part is con-
35 cocted by the proper heat present in each part, and that if the heat is incapable of
784ᵇ1 doing so, the part is destroyed, and deformation or disease results. (This sort of cause must be spoken about in a more exact way later on in the treatise *On Growth and Nourishment*.[311]) In those human beings, then, in whom the nature of the hair is low in heat and too much liquid enters, the proper heat is incapable of concocting it and
5 the hair becomes putrefied due to the heat in the environment. For all putrefaction

311. *PA* 650ᵇ10.

comes about due to heat, but not—as was said elsewhere[312]—due to innate heat. Putrefaction occurs in the case of water, earth, and all bodies of this sort, which is why it also occurs in the case of earthen vapor—for example, what is called "mold"; for mold too is in fact a putrefaction of earthen vapor. So, in hair too this sort of nourishment, because of not being concocted, putrefies and what is called "grayness" results. It is white because mold too, alone (one might almost say) among putrid things, is white.

The cause of this is that it contains much air; for all earthen vapor has the capacity of coarse-grained air.[313] For mold is like the counterpart of hoar-frost; for if the vapor that rises up solidifies, it becomes hoar-frost. If it putrefies, it becomes mold. That is why too both are on the surface of things; for vapor forms on the surface. Also, the poets make a good metaphor[314] when jestingly calling gray hair "mold of old age" and "hoar-frost." For the one is the same in kind, and the other in form: hoar-frost in kind (for both are a vapor), mold in form (for both are a putrefaction).

Here is a sign that going gray is a thing of this sort: in fact, as a result of diseases too many people grow gray hair, but later on, when they become healthy, grow black ones instead of these. The cause is that in sickness, just as in the whole body there is a deficiency of natural heat, so too the various parts, even the very small ones, share in this sickness. And much residue occurs in their bodies and in the parts. That is why the non-concoction of the residue in the flesh produces gray hair. But when they become healthy and strong, they again change and, as it were, from being old become young, and the affections change accordingly. And one might even correctly say that disease is an additionally acquired old age, old age a natural disease. At any rate, some diseases produce the same effects as old age.

The temples go gray first. For the back of the head is empty of liquid because it does not have a brain in it, while the bregma contains a large quantity of liquid—and **785ᵃ1** a large quantity does not easily putrefy. The hairs on the temples, however, have neither so little liquid as to concoct nor so much as not to putrefy; for since this place on the head is intermediate between the two others it is exempt from both affections.

As regards the grayness of the hair of human beings, then, the cause has now been stated.

5.5
Hair (3)

In other animals the cause of this change not noticeably occurring due to time of life is precisely the same one that was also stated in the case of baldness: their brain is small and contains less liquid, so that the heat is not entirely incapable of effecting

312. *Mete*. 379ᵃ16–18.
313. *Mete*. 340ᵇ24–26.
314. *Rh*. 1405ᵃ35–36.

its concoction. In horses, of all the animals we know, signs of it most appear, because the bone they have around the brain is thinner than that of all the others. A proof of this is that a blow to this place is fatal to them. That is why Homer too has put things as follows:

> There where the first hair of a horse's
> Skull grow is a place most mortal.[315]

Hence the flow of the liquid [to this hair] is easier because of the thinness of the bone, and as the heat fails because of age, this hair goes gray. And reddish hair goes gray faster than black hair; for redness too is a sort of sickness of the hair, and all weak things age more quickly.

The cranes are said to go darker as they get older. The cause of this affection would be that the nature of their feathers is more liquid[316] by nature, and as they grow old there is more liquid in their feathers than is easily putrefied.

A sign that grayness occurs due to a sort of putrefaction, and that it is not, as some people think, a drying-up, is that hair protected by hats or other coverings goes gray faster (for winds prevent putrefaction, and the protection produces an absence of wind), and that anointing them with a mixture of water and oil is a help. For while the water cools them, the oil mixed with it prevents them from drying quickly; for water is quickly dried up. A sign that it is not a drying-up, that hair does not whiten as grass does by drying-up, is that some hair grows gray from the outset, and nothing that is dried-up grows. Many hairs too are white at the tip; for it is into the extremities and thinnest parts that the least heat comes.

785[b]1 In the other animals, when the hair is white, this occurs by nature and does not come about by virtue of an affection. And the cause of the colors in the others is their skin; for if they are white, the skin is white, if they are dark, it is dark, and if they are piebald, and come to be from a mixture, it is seen to be white in the one part, dark in the other. But in the case of the human beings, the skin is in no way a cause; for even white-skinned ones have very dark hair. The cause is that, for its size, the human being has the finest-grained skin of all the animals, which is why it has no strength for changing the hair. Instead, because of its weakness, the skin itself also changes its color and becomes darker due to the sun and the winds, while the hair does not change together with it. In the other animals, however, the skin, because of its coarse-grainedness, has the capacity of the region.[317] That is why the hair changes in accord with the skin, but the skin does not change in accord with the winds and the sun.

315. *Iliad* 8.83–84.

316. Reading ὑγροτέραν.

317. I.e., the capacity to influence the color of hair, which itself depends in part on diet and environment (767[a]28–32).

5.6
Color of Animals

Among the animals, some are single-colored (and by "single-colored" I mean the ones whose whole kind has one color, for example, all lions are tawny, and this also applies to the birds, the fishes, and the other animals in a similar way); others, though many-colored, are whole-colored (I mean those whose whole body has the same color, for example, the cow is wholly white or wholly dark); others variegated. This latter is twofold; sometimes it applies to the kind, for example, the leopards, the peacocks, and some of the fishes, for example, the ones called *thratta*,[318] but sometimes, though the entire kind is not variegated, variegated offspring come to be, for example, the cows and the goats, and, among the birds, for example, the common pigeons. And other kinds of birds are affected in the same way.

The whole-colored animals exhibit change much more than the single-colored ones, both to the simple color of the others (for example, from white parents a dark [offspring] comes or from dark parents a white offspring) and from both parents of both colors, mixed offspring come. This is because it is in the nature of the whole kind not to have [only] one color; for the kind is easily moved in both directions, so that it exhibits change more both to [the color] of the others and to being variegated.

The single-colored, on the other hand, exhibit the contrary; for they do not exhibit change except due to an affection, and this rarely; for a white partridge, raven, sparrow, and bear are known to have been observed. This results from its being distorted in the process of generation; for what is small is easily destroyed and easily moved, and what is coming to be is of this sort; for the starting-point of things that are coming to be lies in something small.

And the ones that exhibit the most change are those which, though by nature whole-colored, are in kind many-colored, due to the waters [they drink];[319] for hot waters make the hair white, cold ones make them dark, just as in the case of plants. The cause is that the hot ones contain more breath than they do water, and the air shining through produces whiteness, as it also does in foam. Hence just as skins that are white due to an affection differ from skins that are white due to nature, so too in hair the whiteness due to disease or time of life differs from the whiteness of hair due to nature, in that the causes are distinct; for the natural heat produces the whiteness of the latter, alien heat that of the former. And whiteness is produced in all things by the vaporized air enclosed in them. That is also why those animals that are not single-colored are all white under the abdomen. For (one might almost say) all white animals are hotter and have more pleasant-tasting flesh due to the same cause; for the concoction produces the pleasant taste, and the heat produces the concoction. And the cause is the same for the ones that are single-colored, but either dark or white;

318. Perhaps the same as the *thritta* mentioned at *HA* $621^{b}16$.
319. $767^{a}28$–32.

for heat and cold are the causes of the nature of the skin and the hair; for each of the parts has its own proper heat.

Further, tongues differ among simple-colored and variegated animals, and among those that though simple-colored differ in color—for example, white ones and dark ones. The cause is the one stated previously,[320] that the skins of the variegated ones are variegated, and those of white-haired ones and of the dark-haired ones are white and dark, respectively. We must suppose the tongue to be, as it were, one of the external parts, not supposing that it is covered by the mouth, but rather that it is like a hand or a foot. So, since the skin of the variegated animals is not single-colored, this is also the cause in the case of skin on the tongue.

Some of the birds and some of the wild four-footed animals change their colors in accord with the seasons. The cause is that just as the human beings change in accord with the time of life, this change happens to them in accord with the seasons; for this is a greater difference for them than the turn in accord with age.

The more omnivorous animals are more variegated, to speak in terms of what holds for the most part, and reasonably so—for example, the bees are more single-
786[b]1 colored than the hornets or the wasps; for if the nourishments are the causes of the change, it is reasonable for variegated nourishments to produce all sorts of movements and all sorts of residues of the nourishment from which the hair, the feathers, and the skin come to be.

Concerning both colors and hair, then, let things be determined this way.

5.7
Voices of Animals

As regards the voice, it is low-pitched in some animals, high-pitched in others, and in others again well pitched and having a relation to both extremes that is proportional; further, some have a big voice, others a small voice, and it differs in smoothness and roughness, in flexibility and inflexibility—it must be investigated, then, due to what causes each of these belongs to a voice.

As regards highness and lowness of pitch, we must think the cause to be the very same one as in the case of the change from youth to age. For all the other animals when young emit a higher-pitched sound, but among cows, the calves emit a lower-pitched one. The same happens in the case of males and females. For, in the other kinds of animals, the female emits a higher-pitched sound than the male (this is most noticeable in the case of the human beings; for it is most of all to these that nature has assigned this capacity, because they alone among the animals make use of speech, and the matter of speech is voiced sound), but in the case of cows the contrary obtains; for the females emit a lower-pitched sound than the bulls.

320. 785[b]2–6.

What animals have a voice for the sake of, and what a voice is, and, in general, a sound, has been stated partly in *De Sensu*, partly in *De Anima*.[321] But since low-pitch in a voice lies in the movement[322] being slow, and high-pitch in its being fast, whether the cause is the mover or the moved involves a certain puzzle. For some people say that what is much is moved slowly, what is little quickly, and that this is the cause of lowness and highness of pitch, respectively. Up to a point this is correctly stated, but not wholly correctly. For, as regards the kind, it seems correctly said that lowness of pitch lies in what is moved being of a certain size. If it were so, however, it would not be easy to emit a sound that is both small and low-pitched, nor, similarly, one that is big and high-pitched. Also, a low-pitched voice seems to be characteristic of a nobler nature,[323] and in melodies what is low-pitched is better than what is strained;[324] for being better lies in being superior, and lowness of pitch is a sort of superiority. But since the low-pitched and high-pitched in a voice are distinct from big-voiced and small-voiced (for there are animals that are both high-pitched-voiced and big-voiced, and likewise ones that are small-voiced and low-pitched-voiced), and similarly too with respect to the pitch intermediate between these—by what else about these could one distinguish them (I mean bigness and smallness of voice) except the large or small quantity that is moved? If, then, high and low pitch are distinguished in accord with what is said [by the people in question], the result will be that the same animals are low-pitched and big-voiced, high-pitched and small-voiced. But this is false.

The cause [of the puzzle] is that big and small, much and little, are sometimes said of things unconditionally, at other times, in relation to each other. Bigness of voice, then, lies in what is moved being unconditionally much, smallness of voice in its being unconditionally little, while low-pitch and high-pitch depend on exhibiting this difference in relation to each other. For if what is moved exceeds the strength of what moves it, it is necessary for what is spatially moved to be spatially moved slowly; if it is exceeded, quickly.[325] Sometimes, then, the strong, moving much because of its strength, produces a slow movement, other times, because of its superiority, a quick one. In accord with the same argument too, sometimes weak movers, moving what is for their capacity much, produce a slow movement, but other times, moving little because of their weakness, a quick one.

These, then, are the causes of the contrarieties: of not all young animals having high-pitched voices or low-pitched ones, nor all the older ones, nor males and females; and in addition to this, of both the sick and those having a body in a good condition emitting high-pitched sounds; and further too, of people, as they approach

321. *Sens*. 437^{a}10–17, *DA* 420^{a}23–26, ^{b}27–29.
322. I.e., of air (787^{a}29).
323. *NE* 1125^{a}12–16.
324. As one must strain one's vocal cords (or tighten an instrument's strings) in order to reach high notes.
325. *Ph*. 250^{a}4–9.

old age, getting a more high-pitched voice, though this time of life is the contrary of youth.

Most young animals, then, and most females, moving little air because of their incapacity, have high-pitched voices; for the little air is spatially moved quickly, and in a voice what is quick is high-pitched. But in calves and female cows, in the one case because of time of life, in the other because of the nature of the female, the part by which they move [the air][326] does not possess strength, but because they move much air, they emit low-pitched sounds; for what spatially moves slowly is heavy [or low], and much air spatially moves slowly. These animals move much [air], but the others move little, because the vessel through which the breath first spatially moves has in them a large opening and is compelled to move much air, while in the others it is easily regulated.[327] And as their time of life advances, this part that does the moving in each animal becomes stronger, so that they change to their contrary, and the ones with high-pitched voices come to have lower-pitched ones that they had, and the ones with low-pitched voices come to have higher-pitched ones. That is why bulls have a higher-pitched one than calves and female cows.

In all animals, strength lies in the sinews, which is why those in the prime of life are stronger; for the young are more unarticulated and more without sinews. Further, in the young they are not yet tight, while in the old the tightness by then slackens. That is why both are weak and lacking in capacity for movement. Bulls are especially sinewy, even their heart. That is why the part by which they move the breath has tension, just like a string made of sinew that is stretched tight. What makes it clear that the heart of male cows has this sort of nature is the fact that a bone actually occurs in some of them. And bones seek the nature of sinews.[328]

When castrated, all animals change to the female condition and, because of the slackening of the sinewy strength in its starting-point, emit a voiced sound similar to that of the females. The slackening is much the same as if one were to stretch a cord and make it tight by hanging some weight on it, as women do who weave at the loom; for they too stretch the warp by attaching what are called "loom stones" to it. For this is how the nature of the testicles too is attached to the spermatic ducts, and these to the blood vessel whose starting-point is at the heart near the part that moves the voice. That is why as the spermatic ducts change near the age at which they are then able to secrete seed, this part also changes along with them. And when this changes, the voice too changes, and though it changes more in males, the same also happens in the case of females, though in a less obvious way, and what some people call "bleating like a goat" results, when the voice is uneven. After this it settles into the low-pitched or high-pitched voice of the succeeding time of life. But if the testicles are removed, the stretching of the ducts slackens as when the weight is removed from

326. The windpipe.
327. 788[a]28–34.
328. The bones are "bound together" by sinews (*PA* 654[b]19) and so could not do their work, or be living bones, without them.

the cord and the warp. And as this slackens, the starting-point that moves the voice is proportionally released.

It is due, then, to this cause that castrated animals change to the female condition, both in voice and in the rest of their shape, because of the resulting slackening of the starting-point from which the tension of the body originates, not, as some suppose, because the testicles themselves are a ganglion of many starting-points. On the contrary, small changes are causes of big ones, not due to themselves, but rather when it happens that a starting-point changes along with them. For starting-points, though small in size, are great in capacity; for this is what it is for something to be a starting-point, that it is itself the cause of many things, with nothing else above it being a cause of it.

The hotness or coldness of their place [of habitation] also contributes to some animals being so composed by nature as to have in some cases low-pitched voices and in others high-pitched ones. For hot breath, because of being coarse-grained, produces lowness of pitch in a voice, while cold, because of being fine-grained, produces the contrary. This is clear too in the case of pipes; for those who use hotter breath, and emit it in the same way as people who are groaning, play at a lower pitch.

The cause of roughness and smoothness of voice, and of all unevenness of this sort, is that the part of the instrument [or organ] through which the voice spatially moves is rough or smooth, or, in general, even or uneven. This is clear when there is any wetness about the windpipe, or when it becomes rough due to some affection;[329] for then the voice too becomes uneven.

Of flexibility and inflexibility of voice the cause is the instrument's [or organ's] being soft or hard; for a soft one is capable of being regulated and becoming of any and every sort, while a hard one is incapable of this. And a soft one is capable of emitting both a small and a big sound. That is why it can be both high-pitched and low-pitched; for it easily regulates the breath, easily becoming big or small itself. But hardness cannot be regulated.

About whatever things having to do with voice that were not previously determined in *De Sensu* and in *De Anima* let this much be said. **$788^{b}1$**

5.8
Teeth of Animals

As regards the teeth, it has been stated previously[330] that they are not for the sake of one thing, nor do all animals have them for the sake of the same thing, but rather some have them because of their nourishment, others also for strength and for speech by means of the voice. But why the front teeth come to be first and the molars later,

329. E.g., phlegm, hoarseness.
330. *HA* $501^{a}8$–$^{b}5$, *PA* $655^{b}8$–11, $661^{a}34$–$^{b}27$.

and why the latter are not shed, while the former are shed and grow again—it is the accounts concerned with generation that must consider the innate cause of these things.

About these things Democritus too has spoken, but he has not spoken correctly; for he states a universal cause without having investigated all cases. For he says that the shedding is due to the fact that the teeth come to be prematurely; for it is when animals are (one might almost say) in their prime that the teeth grow in accord with nature, while of their coming to be prematurely suckling is the cause assigned. And yet the pig also suckles but does not shed its teeth.[331] Further, sawtoothed animals[332] all suckle, but some of them do not shed any teeth except the canines—for example, the lions. Democritus made this error, then, in speaking universally without investigating what happens in all cases. But this is what we must do; for it is necessary for the one who speaks universally to say something about all cases.

Since we assume, making our assumption on the basis of what we observe, that nature neither omits any of the things possible in each case nor produces any pointlessly, and since it is necessary, if an animal is going to get any nourishment after being weaned, for it to have instruments for work on nourishment—if, then, as Democritus says, this happened around the time of maturity, nature would omit one of the things it was possible for it to produce, and the work of nature would be contrary to nature. For what is by force is contrary to nature, but he says that the generation of the [first] teeth is by force. But that this is not true is evident from these considerations and others of this sort.

These [front] teeth come to be before the broad ones, first because their work is earlier (for dividing comes before crushing, and the broad ones are for crushing, the others for dividing), and next because what is smaller, even if begun at the same time, naturally comes to be faster than what is larger. And these teeth are smaller in
789ᵃ1 size than the molars, because the bone of the jaw is broad there but narrow near the mouth. Of necessity, then, more nourishment flows from the larger part, less from the narrower one.

But though suckling itself contributes nothing [to the teeth], the hotness of the milk makes them sprout more quickly. A sign of this is that even in suckling animals those that get hotter milk grow their teeth faster; for what is hot is productive of growth.

Teeth are shed after coming to be, however, for the sake of the better, because what is sharp is quickly blunted. Another set must be provided, then, for the work. The broad ones, by contrast, cannot be blunted, but due to being pounded as the time passes, only become ground down. Of necessity, on the other hand, they are shed because, while the roots of the molars are situated where the jaw is broad and the bone strong, those of the front teeth are in a thin part, which is why they are

331. It does in fact shed its teeth.
332. *HA* 501ᵃ18–19.

weak and easily moved. And they grow again because they are shed while the bone is still growing and while it is still the time of life for teeth to come to be. A sign of this is that even the broad ones grow for a long time; for the last ones emerge at around twenty years of age. In some cases, indeed, people are quite aged by the time their last teeth are fully grown. This is because there is much nourishment in the wide part of the bone, while the front part, because of its thinness, quickly reaches completion, and residue no longer occurs in it; instead, the nourishment is used up for its own growth.

Democritus, however, omitting to mention the for-the-sake-of-which, reduces to necessity all that nature uses—but though they are such, they are nonetheless for the sake of something and in each case for the sake of what is better. So nothing prevents the teeth from coming to be and being shed in the way he says, but it is not because of these things, but rather because of the end. These things are causes, but as movers, as instruments, and as matter, since it makes perfect sense, indeed, for nature to make most things using breath as instrument—for just as some things have many uses in the crafts, as in blacksmithing are the hammer and the anvil, so too does breath in those composed by nature. Saying that the causes are [all] of necessity, however, seems similar to someone thinking that it is because of the surgeon's knife alone that water is drawn from a dropsical patient, and not because of his being healthy, for the sake of which the knife made the cut.

The teeth, then, and why some are shed and come to be again, and, in general, due to what cause they come to be, have now been spoken about. And we have also spoken about the other affections of the parts that come about not as the result of a for-the-sake-of-something, but of necessity and because of the moving cause.

— VOLUME 2 —

METAPHYSICS*

BOOK 1 (ALPHA)

1.1
Theoretical Wisdom as a Science Concerned with Primary Causes and Starting-Points

All human beings by nature desire to know. A sign of this is our liking for the perceptual modalities; for even apart from their use, these are liked because of themselves—and most of all the one in virtue of the eyes.[1] For it is not only in order to do an action, but even when we are not going to do anything whatever, that we choose sight over (one might almost say) all the others. The cause is that, of the perceptual modalities, this one most of all makes us know and makes clear many differences. 980ª20 25

Animals are by nature born with perception. In some of them, memory does not come about from this, but in others it does come about. And because of this, some are practically wise and others better at learning[2] than those incapable of remembering. Practically wise, but outside the reach of teaching, are those that cannot hear sounds (for example, bees[3] and whatever other animal kind may be like them), while those that in addition to memory have this perceptual modality can be taught. 980ᵇ20 25

The other animals live by appearances and memories, and have but a small share in experience, while humankind lives also by craft knowledge and by rational calculations. From memories experience comes about in human beings; for many memories of the same thing finally bring about the capacity of one experience. Indeed, experience seems pretty much similar to scientific knowledge and craft knowledge. But scientific knowledge and craft knowledge come to human beings through experience; for "experience made craft," as Polus correctly says, "and lack of experience, luck." **981ª1**

Craft knowledge comes about when, from many intelligible objects belonging to experience, one universal supposition about similar things comes about. For to have a supposition that when Callias was sick with this disease this treatment benefited him, and similarly with Socrates and many other particular cases, is a matter of experience. 5

* Translated by C. D. C. Reeve. Text (unless otherwise indicated): W. Jaeger, *Aristotelis Metaphysica* (Oxford, 1957).

1. F90 45.1.

2. Reading τὰ μὲν φρόνιμα τὰ δὲ μαθητικώτερα.

3. Cf. *HA* 627ª15–19.

But to suppose that it benefited everyone of a certain sort, marked off by a single form, suffering from a certain disease (for example, phlegm-filled or bilious people when burning with a fever), is a matter of craft knowledge.

With a view to action, then, experience seems no different from craft knowledge—on the contrary, we even see experienced people being more successful than those who have an account but are without experience. The cause of this is that experience is knowledge of particulars, while craft knowledge is of universals, and actions and productions are all concerned with particulars; for the doctor does not cure humankind, except coincidentally, but Callias or Socrates or someone else spoken of in that way,[4] who happens to be a human. If, then, someone without experience has the account and knows the universal, but does not know the particular included under it, he will often make an error in treatment; for it is the particular that admits of treatment.

Nonetheless, we think that knowledge and comprehension belong to craft rather than to experience, and that craftsmen are wiser than experienced people, on the supposition that in every case wisdom follows along with knowledge rather than with experience. That is because craftsmen know the cause, while experienced people do not. For experienced people know the that but do not know the why, while craftsmen know the why, that is, the cause.

It is also because of this that we consider the architectonic practitioners in each case to be more estimable, to know in a yet more full sense, and to be wiser than the handicraftsmen, because they know the causes of the things they produce. The handicraftsmen, by contrast, we consider to be like some sort of inanimate things that produce without knowing the things they produce, in the way, for example, that fire burns. But while inanimate things produce each result by a sort of nature, the handicraftsmen do so by habit—the supposition being that architectonic craftsmen are wiser not in terms of being practically efficient, but in terms of having the account themselves and knowing the causes. And, in general, a sign of the person who knows, as opposed to the person who does not know, is his capacity to teach. That is why we think that craft knowledge is more like scientific knowledge than experience is; for craftsmen can teach, while experienced people cannot.

Further, we do not think that any perceptual modalities whatever constitute wisdom, and yet they are most in control of the knowledge of particulars, at any rate. Still, they do not tell us the why of anything (for example, why fire is hot), but only that it is hot.

At first, then, anyone who discovered any sort of craft that went beyond the common perceptual modalities was quite likely wondered at by people, not only because there was something useful in his discoveries, but also because he was thought wise and superior to others. But as more crafts were discovered, some of which were related to necessities, others to passing the time, it is quite likely that the discoverers of the

4. I.e., by means of a proper name.

latter were always supposed to be wiser, because their sciences did not aim at use. When all such crafts were already developed, the sciences that aim neither at pleasure nor at necessities were discovered, first in the places where people had leisure. That is why the mathematical crafts first arose in Egypt, for there the priestly class were allowed to be at leisure.

It was stated in the *Ethics*[5] what the difference is between craft knowledge, scientific knowledge, and other things of the same kind. What our present account is for the sake of, however, is this. Everyone supposes that what is named "wisdom" is concerned with the primary causes and the starting-points. So, as was said previously, the person of experience seems wiser than those who have any perceptual modality whatever, a craftsman than experienced people, an architectonic craftsman than a handicraftsman, and theoretical sciences than productive ones. **982^{a}1** It is clear, then, that theoretical wisdom is scientific knowledge of certain sorts of starting-points and causes.

1.2
Theoretical Wisdom as the Science of God

Since this is the science we are seeking, what must be investigated is the following: what sorts of causes and what sorts of starting-points is theoretical wisdom the scientific knowledge of. If one got hold of the suppositions we have about the theoretically wise person, perhaps the answer would thereby become more evident.

First, then, we suppose that wise person has scientific knowledge of all things, insofar as they admit of it, without his having scientific knowledge of each of them. Next, that the person is wise who has the capacity to know difficult things, that is, things that are not easy for human beings to know; for perception is common to all, which is why it is easy and involves no wisdom. Further, that someone is wiser in any science if he has a more exact knowledge of it and is a better teacher of the causes. Also, that among the sciences, the one choiceworthy for the sake of itself, and for the knowing of it, is more theoretical wisdom than one choiceworthy for the sake of its results. Also, that wisdom is more a ruling science than a subordinate one; for a wise person should prescribe, not be prescribed to, and should be obeyed by the less wise, not obey someone else. These, then, are the sort and number of suppositions we hold about theoretical wisdom and theoretically wise people.

Among these, scientific knowledge of all things necessarily belongs to the person who most of all has universal scientific knowledge; for he in a way knows all the things that fall under it. The most universal things of all, however, are almost the most difficult for human beings to know; for they are furthest from perception. And the most exact of the sciences are those concerned most of all with the primary

5. *NE* 6.3–11.

things; for the sciences that proceed from fewer things (for example, arithmetic) are more exact than those that proceed from an addition (for example, geometry).[6] But then too the one that provides theoretical scientific knowledge of the causes is more teachable; for those people teach who state the causes of each thing. And knowing—that is, knowing scientifically—for its own sake most of all belongs to the science of what is most scientifically knowable of all; for the person who chooses to know scientifically because of itself will most of all choose to have what is most of all scientific knowledge, and this is the science of what is most scientifically knowable of all. And what is most scientifically knowable of all are the primary things and causes; for it is through these, and proceeding from these, that the other things are known, not these because of those that fall under them. But the most fitted for rule of the sciences—that is, the one that is fit for rule rather than being subordinate—is that which knows that for the sake of which each thing is to be done, and this is the good of each of them, and in general, the best good in all of nature.

So, from all that has been said, the name being inquired about applies to the same science [as has all these features]; for this must be the one that gets a theoretical grasp on the primary starting-points and causes, and the good or the for-the-sake-of-which is one of these causes.

That it is not a productive science is clear too from those who first turned to philosophy; for it is because of wondering at things that human beings, both now and at first, began to do philosophy. At the start, they wondered at those of the puzzles that were obvious,[7] then, advancing little by little, they puzzled over greater issues—for example, about the affections of the moon and about issues concerning the sun and stars, and how the universe comes to be. Someone who puzzles or wonders, however, thinks himself ignorant (which is why, indeed, the philosopher is in a way a myth-lover;[8] for myth is composed of wonders). So, if indeed it was because of [a desire] to avoid ignorance that they engaged in philosophy, it is evident that it was because of [a desire] to know that they pursued scientific knowledge, and not for the sake of some sort of utility.

What in fact happened is witness to this; for it was when pretty much all the necessities of life, as well as those related to ease and passing the time, had been supplied that such wisdom began to be sought. So clearly we do not inquire about it because of its having another use, but just as a human being is free, we say, when he is for his own sake and not for someone else, in the same way we say that this is the only free science; for it alone is for its own sake.

That is why, indeed, the possession of this science might be justly regarded as not for human beings; for in many ways the nature of human beings is enslaved, so that, according to Simonides, "a god alone can have this privilege," and it is not fitting

6. *APo*. 87a31–37.
7. Reading τὰ πρόχειρα τῶν ἀπόρων.
8. Reading φιλόμυθος ὁ φιλόσοφος πῶς.

that a human being should not be content to inquire about the science that is in accord with himself.[9] If, then, there is something in what the poets say, and envy is natural to the divine, it would probably occur in this case most of all, and all those **983ª1**
who went too far [in this science] would be unlucky. The divine, however, cannot be envious—but, as the proverb says, "Bards often do speak falsely." Moreover, no science should be regarded as more estimable than this. For the most divine science is also the most estimable. And a science would be most divine in only two ways. For the one that a god most of all would have is a divine science, and so is any science of divine things. And this science alone is divine in both these ways; for the god seems 5
to be among the causes of all things and to be a sort of starting-point, and this is the sort of science that a god alone, or that he most of all, would have. All the sciences are more necessary than this one, then, but none is better. 10

The acquisition of it, however, must in a way leave us in a condition contrary to the one in which we started our search. For everyone, as we said,[10] starts by wondering at something's being the way it is, just as people do at those wondrous automata,[11] when they do not have a theoretical grasp on their cause, or at the turnings of the sun, or at the incommensurability of the diagonal (for it seems a wonder to all those who 15
have not yet gotten a theoretical grasp on the cause that there is something that is not measurable even by the smallest unit). It is the contrary and proverbially the better condition, however, that we must end up in, as also happens in those other cases when people learn [the cause]; for nothing would make a man who knows geometry wonder more than if the diagonal were to turn out to be commensurable. 20

What the nature is of the science being inquired about, then, has been stated, and what the target is that the search and the whole methodical inquiry must hit.

1.3
Earlier Philosophers Recognized the Material Cause

It is evident, then, that we must acquire scientific knowledge of the causes that are starting-points; for we say that we know each thing when we think we know its 25
primary cause. Things, though, are said to be causes in four ways. In one way, we say that the substance or the essence is the cause; for the ultimate thing to which the why leads us is the account, and the why that is primary is the cause and starting-point. In another, it is the matter or the underlying subject. In a third, it is the starting-point from which the movement derives. In a fourth, the cause opposite to this, that is, 30
the for-the-sake-of-which and the good; for this is the end of all coming to be and of all movement.

9. Cf. *NE* 1177^b31–1178^a2.
10. 982^b11–17.
11. *MA* 701^b1–32.

We got an adequate theoretical grasp on these in our studies concerning nature.[12]
983ᵇ1 Nonetheless, let us call also on those prior to us who undertook the investigation of the beings and philosophized about the truth. For it is clear that they too speak of certain starting-points and causes. So reviewing them will be of some assistance to
5 the present methodical inquiry; for either we will discover some other kind of cause or trust all the more in those mentioned just now.

Among those who first philosophized, then, most thought that the starting-points of all things were of the material form only; for that from which all things come, and from which as a first thing they come to be and into which they pass away in the end, the substance that persists throughout as an underlying subject while its affections
10 change—this, they say, is element and this the starting-point of the beings. And because of this they think that nothing either comes to be or is destroyed, since a nature of this sort is always preserved. Just as we do not say that Socrates unconditionally comes to be when he comes to be noble or musical, or that he is destroyed when he
15 loses these states, because the underlying subject—Socrates himself—persists, so too they do not say that anything does so in the other cases; for there is always[13] some nature, whether one or more than one, from which the other things come to be while it is preserved.

Yet about the number and form of this sort of starting-point they do not all say the
20 same thing. Thales, the one who started this sort of philosophy, says it is water (because of this, he also declared that the earth rests on water), perhaps reaching this supposition from seeing that the nourishment for all things is wet, that the hot itself comes to be from this, and what is alive lives by this[14] (and what they come to be
25 from is starting-point for all). Because of this, then, he reached this supposition, and because the seeds of all things have a wet nature, and water is the starting-point of the nature for wet things.

Some people[15] suppose that even the ancients who lived long before the present generation, and who first theologized, thought similar things about nature; for they
30 made Ocean and Tethys the parents of coming to be, and made the gods swear their oath by the water they called "Styx"; for what is oldest is what is most estimable, and what is most estimable is what one swears an oath by. It is perhaps unclear whether
984ᵃ1 this belief about nature is in any way ancient or even old, but Thales, at any rate, is said to have declared this about the primary cause (for no one would consider Hippo worthy of inclusion with these, because of the shabbiness of his thought).

5 Anaximenes and Diogenes posit air as prior to water and as more than anything else the starting-point of the simple bodies. Hippasus of Metapontium posits fire, as does Heraclitus of Ephesus. Empedocles, however, posits four things, positing earth

12. *Ph.* 2.3, 2.7.
13. Reading ἀεὶ.
14. Reading καὶ τὸ ζῷον τούτῳ ζῶν.
15. Homer, *Iliad* 14.201, 246 (parents), 15.38 (oath).

along with those already mentioned as a fourth (for these, he says,[16] always persist and do not come to be, except in quantity or smallness, aggregating into one and disaggregating from one).

Anaxagoras of Clazomenae, who was prior to Empedocles in age but in works later, says that the starting-points are unlimited; for he says that pretty much all the uniform things (like water and fire) come to be and are destroyed in this way, through aggregation and disaggregation alone. Otherwise, they neither come to be nor are destroyed, but persist and are eternal.

On the basis of this, then, one might think that the only cause is the so-called material form. But as people progressed in this way, the facts themselves showed them the way and compelled them to inquire further; for however much all coming to be and passing away may be from some one thing (or even from more than one thing), why does this happen? That is, what is the cause? For the underlying subject itself does not make itself change, at any rate. I mean, for example, that neither the wood nor the bronze is a cause of either of them changing, nor does the wood make a bed or the bronze a statue, but something else is the cause of the change, and to look for this is to look for another starting-point—the starting-point from which the movement derives, as we would say.

Those, then, who altogether at the start latched onto this methodical inquiry, and said that the underlying subject was one, had no misgivings about this. But some of those who said that it was one, as if defeated by this inquiry, said that the one, that is, nature as a whole, is immovable—not only as regards coming to be and passing away (for this is an ancient view agreed to by all), but also as regards every other sort of change, and this view is special to them. Among those who said that the universe is one, then, none managed to discover a cause of this sort, except perhaps Parmenides, insofar as he posited causes not only as one but also somehow as two.[17] Therefore, for those who make a plurality [of underlying subjects] it is more possible to state [what this sort of cause is]—for example, for those [who posit] hot and cold or fire and earth; for they treat fire as having a nature that initiates movement, and treat water, earth, and things of this sort in the contrary way.

After these thinkers and these sorts of starting-points, which were found inadequate to generate the nature of the beings, people were again compelled by the truth itself, as we said,[18] to look for the next sort of starting-point. For that the good or noble[19] state of some of the beings—or the coming to be in that state of other ones—should have fire or earth or anything else of this sort as its cause is presumably not probable, nor is it probable that these people should have thought so. But to turn over so important a fact to chance or luck could not be correct either. When one person said, then, that understanding was present (just as in living things) in nature too,

16. B17 DK.
17. $986^{b}27–987^{a}2$.
18. $984^{a}18–19$.
19. $1078^{a}31–32$.

as the cause of the cosmos and of all, he seemed like a sober person by contrast with his improbability-uttering predecessors. We know that Anaxagoras explicitly adopted these accounts, but Hermotimus of Clazomenae is "charged" with speaking that way earlier. Those who supposed this, then, thus posited the cause of their noble state as a starting-point of the beings, and at the same time that this is the sort of cause from which the movement starts for them.

1.4
The Discovery of the Efficient Cause

One might suspect that Hesiod was the first to look for this sort of thing, or someone else who posited love or appetite among the beings as a starting-point, as, for example, Parmenides also did; for he too, in describing the coming to be of the universe, says that "first of all the gods she devised Love."[20] And Hesiod says,

> Of all things the very first that came to be was Chaos, and then
> Broad-breasted Earth,
> And Love, preeminent among all the immortals,[21]

on the supposition that there must be some cause among the beings to move and draw things together. (As for the way these people should be arranged with regard to priority, then, let us leave it till later to judge.[22])

But since it was evident that the contraries of good things were also present in nature (not only order and nobility but also disorder and baseness, and more bad things than good, and more base things than noble ones), someone else accordingly introduced love *and* strife as each singly the cause of one of the two sorts of things. For if one were to follow and grasp the thought of Empedocles,[23] and not the inarticulate words, one would find that love is the cause of good things and strife of bad ones. So, if one were to claim that Empedocles in a way says, and was the first to say, that the good and the bad are starting-points, one would perhaps be right—if indeed the cause of all good things is the good itself.

These people, then, as we say, manifestly latched onto two of the causes we distinguished in our studies concerning nature,[24] the matter and the starting-point of movement. But they did so indistinctly and in a not at all perspicuous way, like untrained people in fights; for these too, as they circle their opponents, often strike good blows, but they do not do so in virtue of scientific knowledge, just as the others

20. B13 DK.
21. *Theogony* 116–120.
22. A promise unfulfilled in our *Metaphysics*.
23. B17, B21, B35, B115 DK.
24. *Ph*. 2.3, 2.7.

do not seem to know what they are saying; for they apparently make pretty much no use of these causes, except to a small extent.

For Anaxagoras uses understanding as a mechanism for cosmic production; for when[25] he is puzzled about what the cause is due to which something holds of necessity, he drags understanding in, but in other cases he makes anything rather than understanding the cause of things that come to be.

As for Empedocles, although he uses these causes to a greater extent than Anaxagoras, he neither uses them adequately nor finds any consistency in them. At any rate, love often disaggregates things for him, while strife aggregates them. For whenever the universe is divided up into its elements because of strife, the fire is aggregated into one, and so is each of the other elements, and whenever things come together into one again under the influence of love, it is necessary that the parts from each get disaggregated again.

Empedocles, then, going beyond his predecessors, was the first to introduce the dividing of this cause, not making the starting-point of the movement one thing, but distinct and contrary ones. Further, he was the first to say that the forms of matter, the so-called elements, were four. Yet he does not use four but treats them as two only, fire by itself, on the one hand, and its opposites—earth, air, and water—taken as one nature, on the other, as one may grasp from studying his verses. He, then, as we say, spoke about the starting-points in this way and as being this many.

Leucippus, however, and his associate Democritus say that the full and the void are the elements, calling the former "being" and the latter "not being" and, of these, the full or the solid is being, while the void is not being (that is why they also say that being no more *is* than not being, because body no more *is* than void[26]), and that these, as matter, are the causes of the beings. And just as those who make the underlying substance one generate the other things by means of its affections, positing the rare and the dense as starting-points of these affections, so, in the same way, these people too say that the differences are the causes of the other things. And these differences, they say, are three—shape, order, and position; for they say that being is differentiated by rhythm, contact, and turning alone. And of these rhythm is shape, contact is order, and turning is position; for A differs from N in shape, AN from NA in order, and Z from N in position. But the question of movement—where it comes from and in what way it belongs to the beings—these people, much the same as the others, carelessly neglected.

Concerning the two causes, then, as we say, this seems to be as far as the earlier philosophers went in their inquiry.

25. Reading ὅταν γὰρ.
26. Reading τοῦ κενοῦ τὸ σῶμα.

1.5
Pythagoreans and Eleatics: Intimations of the Formal Cause

Among these thinkers and before them, those called "Pythagoreans"[27] were the first to latch onto mathematics. They both advanced these inquiries and, having been brought up in mathematics, thought that its starting-points were the starting-points of all the beings. Since among these starting-points the numbers are by nature primary, and since they seemed to observe many similarities to the beings in the numbers, and to things that come to be, more so than in fire, earth, or water (for example, that such-and-such an affection of numbers is justice, that such-and-such an affection is soul and understanding, another one is opportune time, and—one might almost say—each of the rest likewise), and further, seeing in harmonies, affections, and ratios that are found in numbers—since, then, the other things seemed to have been made like numbers in the whole of their nature, and numbers were primary in the whole of **986ᵃ1** nature, they took the elements of numbers to be the elements of all the beings, and the whole heaven to be harmony and number.

And whenever they found consistencies and harmonies in the numbers with the affections and parts of the heaven and with the whole arrangement of the cosmos, they collected these together and fitted them into their scheme. And if there was something missing, they added it eagerly, in order to make their system a connected whole. I mean, for example, that since the number ten seems to be complete and to encompass the whole nature of the numbers, they say that the bodies that move through the heaven are ten, but because those that are visible are only nine they make anti-earth the tenth.

We have discussed these issues more exactly elsewhere.[28] But we are going over them again in order that we may grasp on the part of these thinkers too the starting-points they posit, and in what way these fall under the causes mentioned. It is evident, then, that they too consider that number is a starting-point for the beings both as matter and as affections and states, that the elements of number are the odd and the even, and that of these the odd is limited and the even unlimited. They consider that the one comes from both of these (for it is both odd and even), that number comes from the one, and that the whole of the heaven (as was said) is numbers.

Others among these same thinkers say that there are ten starting-points arranged in two columns:

limited	unlimited
odd	even
one	plurality
right	left

27. F176–191.
28. *Cael.* 2.13.

male	female
resting	moving
straight	curved
light	darkness
good	bad
square	rectangular

This is precisely how Alcmaeon of Croton also seems to have supposed things were, and either he got this account from them or they got it from him; for Alcmaeon too made claims much the same as theirs; for he says that most things relating to human beings come in twos, mentioning not definite contraries, as these thinkers did, but random ones—for example, white and black, sweet and bitter, good and bad, great and small. In this way, then, he threw out indefinite suggestions about the rest, while the Pythagoreans made claims both about how many contraries there are and what they are. **986^{b}1**

From both of these, then, we can grasp this much, that the contraries are the starting-points of the beings, and from the first how many and what they are. Yet in what way these can be brought together and related to the causes mentioned has not been articulated by them in a perspicuous way. They seem, however, to range the elements among the material forms; for it is from these as components that they say the substance of things is composed and molded.

As for the ancients, then, and those who spoke of the elements as plural, we can get an adequate theoretical grasp on their thought from these considerations. There are some, however, who made claims about the universe as being of a singular nature—although not all of them did so in an equally correct way or in a way equally in accord with the facts of nature.[29] An account of these thinkers, then, is in no way appropriate to our present investigation of causes. For they do not, like some of the natural scientists, suppose that being is one, yet generate it from the one as from matter, but speak in another way; for while the former are positing movement in addition (making the universe come to be), the latter say that it is immovable.

However, this much at least does properly belong to the present investigation: Parmenides seems to latch onto what is one in accord with the account, Melissus onto what is one in accord with the matter (which is why Parmenides says that it is limited, Melissus that it is unlimited). Xenophanes, by contrast, who was the first of these monists (Parmenides is said to have been his student), said nothing perspicuous, nor does he seem to have touched upon the nature of either of these causes, but with a view to the heaven as a whole he says that the one is the god. These thinkers, then, as we said, must be set aside for the purposes of the present investigation—two of them altogether, as being a little boorish, Xenophanes and Melissus. Parmenides, however, seems perhaps to speak with more insight; for claiming that beyond being there is no such thing as not

29. Reading τὴν φύσιν.

being, he thinks that being is necessarily one and that nothing else exists (about this we have spoken more perspicuously in our studies concerning nature[30]). But finding himself compelled to follow the things that appear to be so, he supposes that there is one thing according to reason but more than one according to perception, and now posits two causes and two starting-points, hot and cold—in other words, fire and earth. And of these he ranges the first with being and the second with not being.

From what has been said, then, and from the account of the wise men who have now sat in council with us, we have gotten this much: From the first thinkers we got that the starting-point is corporeal (for water and fire and things of this sort are bodies), some positing one corporeal starting-point, others more than one, but both positing them in the form of matter. From some, who posit both this cause and besides it the cause from which the movement derives, which we got as one thing from some, and from others as two things. Up to the Italians,[31] then, and apart from them, the rest spoke about these things as being more of one kind,[32] except that, as we said,[33] they have in fact made use of two causes, and some made the second of them (the one from which the movement derives) one, others two.

The Pythagoreans have spoken of the starting-points as two in the same way, but added this much, which is in fact special to them. They thought that the limited and the unlimited were not certain distinct natures, such as fire or earth or anything else of this sort, but that the unlimited itself and the one itself were the substance of the things of which they were predicated, and that is why number was the substance of all things. On these issues, then, they made claims this way, and so about the what-it-is they also started to speak and to give definitions, even if they treated the issue too simply. For they defined superficially and also the first subject to which a given definition applied, this they believed to be the substance of the thing—as if someone were to think that double and two were the same, because in the first instance double belongs to two. But being double and being two are presumably not the same. Otherwise, the one will be many—a consequence that they in fact drew.

From the earlier thinkers, then, one can get this much.

1.6
Material and Formal Causes in Plato

After the philosophies mentioned came the system of Plato. In most respects it followed these thinkers but also had special features that distinguished it from the philosophy of the Italians. For having been from his youth familiar first with Cratylus[34]

30. *Ph.* 1.3.
31. I.e., the Pythagoreans.
32. Reading μοναχώτερον. Cf. μοναχῶς at 995ᵇ15.
33. 985ᵃ30–31.
34. Also, 1010ᵃ7–15.

and the Heraclitean beliefs that all perceptibles are always flowing, and that there is no scientific knowledge concerning them, these views he also held later. The study Socrates made, though, was concerned with ethical issues, not at all with nature as **987b1**
a whole. In these, however, he was inquiring about what is universal and was the first to fix his thought on definitions. Plato, accepting him [as a teacher], took it that this fixing is done concerning other things and not the perceptible ones; for 5
it is impossible for there to be a common definition of any perceptibles, as they, at any rate, are always changing. He, then, called the beings of this other sort "Forms," and the perceptible ones are beyond these and are all called after these; for the many synonymous [perceptible] things that are homonymous with the Forms[35] are [what they are] through participation in them.

As for participation he changed only the name; for the Pythagoreans say that the 10
beings are [what they are] by "imitating" the numbers, while Plato says that they are [what they are] by "participation," changing the name. What this participation or this imitation of the Forms could be, however, they left an open question.

Further, apart from both the perceptibles and the Forms are the objects of mathematics, he says, which are intermediate between them,[36] differing from the percepti- 15
ble ones in being eternal and immovable, and from the Forms in that there are many similar ones, while the Form itself in each case is one only. And since the Forms are causes of the other things, he thought that their elements were the elements of all the beings. It is as matter, then, that the great and the small were starting-points, and 20
as substance, the one;[37] for generated [as they are] from the great and the small by participating in the one, the Forms are the numbers.[38]

In saying that the one is substance, and is not by being another thing said to be one,[39] he spoke in much the same way as the Pythagoreans, and in saying that the numbers are the causes of the substance of other things he agreed with them. But instead of making the unlimited one thing, making it a dyad from the great and the 25
small is special to him. Further, in his view too the numbers are beyond the perceptibles, while they say that the things themselves are numbers, and do not place the objects of mathematics [as intermediates] between them.

The fact, then, that he made the one and the numbers be beyond the things, not treating them as the Pythagoreans did, and that he introduced the Forms, were due 30
to his investigation of accounts (for the previous thinkers had no share of dialectic), and the fact that he made the other nature a dyad was because he thought that the numbers, except those that are prime, are naturally well-disposed to being generated

35. Reading τὰ πολλὰ τῶν συνωνύμων ὁμώνυμα τοῖς εἴδεσιν.
36. Objects of mathematics as intermediate things, lying between Forms and perceptibles, are referred to at $987^{b}29$, $991^{b}29$, $992^{b}16$, $995^{b}17$, $997^{b}2$, $998^{a}7$, $1002^{b}13$, 21, $1059^{b}6$, $1069^{a}4$, $1077^{a}11$, $1090^{b}35$.
37. *Ph*. $187^{a1}7$–18.
38. Reading τοὺς ἀριθμούς.
39. *APo*. $83^{a}9$–14.

from this as from some plastic material. And yet what happens is the contrary; for
988^{a}1 it is not reasonable that it should happen in the way Plato describes. For as things stand[40] they make many things from the matter, while the Form generates only once, but what is evident is that from one matter comes one table, while the person who imposes the Form, though he is one, makes many. And the relation of male to female
5 is similar; for the female is impregnated by one copulation, but the male impregnates many. And yet these are [merely] imitations of those starting-points.

As regards the things being inquired about, then, Plato described them this way. It is evident, however, from what has been said, that he made use of only two causes, that of the what-it-is and that of the matter[41] (for the Forms are the causes of the
10 what-it-is of other things, as the one is of the Forms), and that a certain[42] [cause] is the underlying matter, of which the Forms are said in the case of the perceptibles, and that, in the case of the Forms, the one is a dyad, namely, the great and the small. Further, he has assigned the cause of good and bad to both elements, one to each,[43] which we
15 say some of the previous philosophers also looked to do—for example, Empedocles and Anaxagoras.

1.7
Prior Thinkers and the Four Causes

We have, then, briefly and in headline fashion, gone through which thinkers have spoken and in what ways about the starting-points and about the truth. Nonetheless,
20 we have gotten this much at least from them, that of those who have spoken about a starting-point and a cause none has mentioned any outside of those we distinguished in our studies concerning nature;[44] rather, it is evident that they are all in some indistinct way touching upon these. For some speak of the starting-point as matter, whether they posit one or many, and whether they make it a body or something
25 incorporeal—for example, Plato speaks of the great and the small, and the Italians of the unlimited, Empedocles of fire, earth, water, and air, Anaxagoras of the unlimited number of uniform things. All these thinkers, then, latched onto this sort of cause,

40. Reading νῦν μὲν γὰρ.
41. A puzzling claim (repeated at 988^{a}33–34), since in addition to material and formal causes Plato also seems to recognize efficient causes, such as the divine craftsman or demiurge (*Sophist* 265b–e, *Timaeus* 28c–29a), the soul (*Phaedrus* 245c–d, *Laws* 891c–899d), and the cause of the mixture of the limited and unlimited (*Philebus* 23d, 26e–27c), and final causes, such as the good aimed at by the divine craftsman or other such cosmic makers (*Philebus* 20d, 53e, *Timaeus* 29d–30c, *Laws* 903c). Reasons to think that the Form of the good is not a satisfactory final cause are given at *NE* $1096^{b}31$–$1097^{a}8$.
42. Reading τὶς.
43. I.e., he made the one the cause of good and the great and the small (matter, the unlimited) the cause of bad.
44. *Ph.* 2.3, 2.7.

and so too did those who spoke of air, fire, water, or something denser than fire and more fine-grained than air; for in fact some have said[45] that the primary element is like this. These thinkers, then, latched onto this cause alone, and certain others onto the starting-point from which movement derives—for example, those who made love and strife or understanding and love a starting-point.

But the essence and the substance no one has presented in a perspicuous way, although those who posit the Forms speak of it the most; for they neither suppose the Forms to be matter for the perceptibles, and the one as matter for the Forms, nor these as the starting-point from which movement comes about—for they say that these are rather causes of immobility and of being at rest; instead, the Forms provide the essence for each of the other things, and the one provides it for the Forms.

And that for the sake of which actions, changes, and movements take place they speak of as in a way a cause, but not in this way—that is, not in the way in which it is its nature to be a cause. For those who speak of understanding or love posit these causes as good, but they do not speak as if anything is or comes to be for the sake of these things, but as if movements arise from them. In the same way too those who say that the one or being is such a nature say that it is a cause of substance, but not that anything is or comes to be for its sake, so that in a way they do and in a way they do not say that the good is a cause; for they do not say it is so unconditionally but coincidentally.

That we have correctly distinguished the causes, then, both how many they are and what they are, all these thinkers also seem to testify (since they have been unable to touch upon any other cause), and, in addition, it is clear that the starting-points must be looked for in all these ways or in some of them. But as for how each of these people has spoken and how he stands concerning the starting-points, let us next, as far as is possible, go through the puzzles about these.

1.8
Criticism of Pre-Platonic Philosophers

Those thinkers, then, who posit that the universe is one and who also posit a single nature as matter, and this corporeal and having magnitude, clearly err in many ways. For they posit the elements of bodies alone, but not of the incorporeal things, although incorporeal ones are also beings.[46] And when they try to state the causes of coming to be and passing away and to give a natural scientific account of all things, they do away with the cause of movement. Further, they err by not positing the substance (that is, the what-it-is) as a cause of anything, and, in addition, by too readily speaking of any of the simple bodies except earth as starting-point, without

45. It is unclear who held this view, also mentioned at *Ph.* $187^{a}14$, *GC* $328^{b}35$, $332^{a}21$.
46. Reading ὄντων καὶ ἀσωμάτων.

investigating the way these things come to be from each other—I mean, fire, water, earth, and air. For some come to be from each other by aggregation and others by disaggregation, and with respect to priority and posteriority this makes a great difference. For in one way the most elemental thing of all would seem to be the primary one from which they come to be by aggregation, and this would be the most fine-grained of the bodies and having the smallest parts.

That is why those who posit fire as starting-point would most of all be speaking in agreement with this account. But each of the others also agrees that the element of the bodies is a thing of this sort. At any rate, none of those who say that it is one thought that earth is the element, clearly because of the largeness of its parts, while of the three [other] elements each has found some judge in its favor, for some say that this is fire, others that it is water, others that it is air. And yet why do they not also say earth, as ordinary people do? For these say that all things are earth, and Hesiod[47] too says that earth was the first of the bodies to come to be (thus it turns out that the supposition is ancient as well as popular). According to this account, then, if someone said it is one of these things, except for fire, or posited that it is denser than air but more fine-grained than water, he would not be speaking correctly. But if what is posterior in coming to be is prior in nature, and what is concocted and aggregated is posterior in coming to be, the result would be the contrary of this, water being prior to air and earth to water.

About those, then, who posit one cause of the sort we described, let so much be said. But the same would apply if someone posits that these are more than one, in the way that Empedocles says that the matter is four bodies. For he too necessarily incurs consequences, some of which are the same as before, while others are special to him. For we see these bodies coming to be from one another in such a way that the same body does not always remain fire or earth (these have been spoken about in our studies concerning nature[48]). Also, about the cause of movement, whether one or two must be assumed, he must be thought to have spoken neither correctly nor altogether reasonably. Generally too, those who speak this way necessarily do away with alteration; for cold will not come from hot or hot from cold. For if it did, there would be something that received these very contraries, and there would be some one nature that became fire and water, which this thinker does not say.

If one supposed Anaxagoras to say that there are two elements,[49] what one supposed him to say would be most in accord with an account that he himself did not articulate, although he would necessarily have had to follow those who do advance it. For to say that at the start all things had been mixed is both strange on other grounds and because it follows that they must have been unmixed before the start, and because a random thing cannot naturally be mixed with a random thing, and in

47. *Theogony* 116 (984^b28).
48. *Cael.* 3.7, *GC* 2.1–5.
49. I.e., the understanding and the primordial mixture, containing an unlimited number of uniform things (985^a18–19, 988^a28).

addition because affections—even [intrinsic] coincidents—would be separated from substances (for of the same things as there is mixture there is also separation).

Nonetheless, if someone were to follow along with him while at the same time helping to articulate distinctly what he wishes to say, he would presumably appear to be speaking in a more advanced way. For when nothing was yet separated out, clearly nothing could be truly said of the substance that was there. I mean, for example, that it was neither white nor black nor gray nor any other color, but of necessity colorless; for otherwise it would have had one of these colors. And similarly it was flavorless, by this same argument, and had not a single one of the similar affections; for it could have neither some quality nor some quantity nor some what. For otherwise one of the particular forms would have belonged to it, and this is impossible, because all were mixed together; for it would have already been separated out (and he says that all things were mixed except understanding, which was alone unmixed and pure). From this, then, it follows that he must say that the starting-points are the one (for this is simple and unmixed) and the other, which is such as we posited the indefinite[50] to be, before it is given definition and participates in some Form. So, while he speaks neither correctly nor perspicuously, he means much the same as later thinkers were saying and now[51] appears more and more to be the case.

But in fact these thinkers are at home only in accounts concerning coming to be, passing away, and movement; for it is pretty much only of this sort of substance that they look for the starting-points and causes. Those, however, who produce their theoretical investigation about all the beings, positing that some of the beings are perceptible, others imperceptible, are clearly conducting an investigation of both kinds. That is why one should devote more time to seeing what they say correctly and what incorrectly in the investigation of the issues now before us.

Those called "Pythagoreans," then, use their starting-points and elements in a stranger way than the natural scientists. That is because they did not get these from perceptibles; for the mathematical beings are without movement, except for those with which astronomy is concerned. Yet all their discussions and the issues they busied themselves with were concerned with nature; for they generate the heaven, and, as regards its parts, affections, and works, they closely observe the things that happen, and they use up their starting-points and their causes on these, as if agreeing with the various natural scientists that being is just this, what is perceptible and is embraced by the so-called heaven. But the causes and starting-points they mention are, as we said,[52] adequate to go up even to the higher beings, and are more fitted to these than to accounts concerned with nature. About what way there can be movement, however, if limited and unlimited and odd and even are the only things assumed, they have nothing to say, or about how it is possible without movement and change for

50. I.e., the "indefinite dyad" (e.g., 1081^{a}14, 22).
51. Reading νῦν.
52. 989^{b}31.

there to be coming to be and passing away or the works of the bodies that are moved throughout the heaven.

Further, if either one granted them that spatial magnitude consists of these elements or that this were proved, still in what way would some bodies be light and others have weight? For, based on what they assume and say, they are speaking no more about mathematical bodies than about perceptible ones. And the reason why they have said nothing whatever about fire, earth, or the other bodies of this sort is precisely, I think, because they have nothing special to say about perceptible bodies.

Further, how should one suppose the affections of number and number itself to be causes of the things that are and that come to be in the heaven both at the start and now, when there is no other number besides this number for the cosmos to be composed of? For when they say that belief and appropriate time are found in such-and-such a part of the cosmos, and injustice and disaggregation or mixture a little above or below, and say that a demonstration of this is that each of these is a number, but there happens to already be a plurality of composed magnitudes in the relevant place, because these affections follow along with the corresponding places, is this the same [sort of] number, the one in the heaven, that one should suppose each of these things to be, or is it another [sort] than this? For Plato says it is another. And yet he too thinks that both these things and their causes are numbers, but that the intelligible numbers are causes, while the other ones[53] are perceptible.

1.9
Criticism of the Theory of Forms

Let us leave the Pythagoreans for now; for it is enough that we have latched onto them to this extent. As for those who posited the Forms, first, in looking to find
990b1 the causes of the beings that exist here, they introduced others, equal in number to these—as if a person who wished to count the beings were to think that he would not be able to do it while there were so few of them, and so tried to count them by making more; for the Forms are pretty much equal in number to—or no fewer than—the things whose causes they were inquiring about, in proceeding from them to the Forms; for in each case there is something that has the same name, both among the other things of which there is a one over many and beyond the substances, both over the things that exist here and over the eternal things.[54]

Further, of the ways in which we prove[55] that there are Forms none makes these evident; for from some of these ways no deduction is necessarily generated, while from some others Forms are also generated of things of which we think there are no Forms. For, according to the arguments from the sciences, there will be Forms of all

53. E.g., "two armies or two herds of cattle" (Plato, *Philebus* 56d).
54. 990b2–991b8 = 1078b34–1079b3.
55. Aristotle is speaking as if in reference to his own beliefs.

things of which there are sciences, and according to the one over many there will be Forms even of negations, while according to the argument that there is thinking of a thing that has passed away, there will be Forms of things that pass away; for there is an appearance of them.[56]

Further, of the more exact of the arguments, some produce Forms of relatives, of which we say there is not an intrinsic kind, while others imply the third man.

And, in general, the arguments for the Forms do away with the things whose existence we, as people who speak of Forms, wish for more than the existence of the Forms; for in fact it follows that it is not the dyad that is primary but number, that the relative is prior to the intrinsic, and all the other things that certain people, by following out the beliefs held about the Forms, have accepted contrary to the starting-points.

Further, by the supposition according to which we say that there are Forms, there will be Forms not only of substances but also of many other things (for in fact the intelligible object is a one not only in the case of substances, but also in the case of the other things, and there are sciences not only of substance but also of the other things, and countless other such difficulties arise). But in accord with the necessities of the case and with the beliefs held about them, if the Forms are to be participated in, there must be Forms of substances only, for they are not participated in coincidentally, but rather a thing must participate in each in this way, insofar as it is not said of an underlying subject (I mean, for example, if something participates in double-itself, it also participates in the eternal, but does so coincidentally; for it is coincidental to the double that it is eternal), so that the Forms will be substance. But it is the same things that signify substance here as over there—or what will it mean to say that there is something beyond these things here, the one over the many? And if the Forms and what participates in them are the same in form, there will be something common to these; for why should the two be one and the same in the case of the twos that pass away and in those that are many but eternal rather than in the case of [two-] itself and some particular [two]? But if they are not the same in form, they would be homonymous, just as if someone were to call Callias and a wooden statue a "man," seeing nothing in common between them.

Above all, one might go through the puzzles about what precisely the Forms contribute to perceptibles, either to those that are eternal[57] or to those that come to be and pass away; for they are not the cause of movement or of any change whatever in them. But then they are also no help at all either as regards the scientific knowledge of the other things; for they are neither their substance (otherwise they would be in them) nor in relation to their being, if they are not components of the things that participate in them; for if they were, they might perhaps seem to be causes in the way that what is white is a cause when mixed with a white thing. But this account is

56. For the arguments, see F174.
57. E.g., the heavenly bodies.

all too readily upset—it is one that first Anaxagoras[58] and later Eudoxus and certain others stated; for it is easy to collect many impossibilities against a belief of this sort.[59]

But then neither is it possible to say, in any of the familiar ways of speaking, that the other things come from the Forms. To say that they are paradigms and that the other things participate in them is to utter empty words and poetic metaphors. For what is it that works by looking to the Forms?[60] It is possible for anything both to be like and become like another thing without being copied from it, so that whether Socrates exists or not, someone could become like him. And the same would clearly hold even if Socrates were eternal. Also, there will be more than one paradigm for the same thing, and so more than one Form—for example, the Forms of man will be animal and two-footed, as at the same time will be man-itself.[61] Further, the Forms will be paradigms not only of the perceptibles but also of themselves—for example, the kind, as kind consisting of several forms. So the same thing will be paradigm and copy.

Further, it would seem to be impossible for the substance and that of which it is the substance to be separate. So how could the Forms, if they are substances of things, be separate from them?

In the *Phaedo*,[62] however, it is said as follows: the Forms are causes both of the being and of the coming to be of things. And yet if the Forms do exist, the things that participate in them would still not come to be unless there was a mover. Also, many other things come to be—for example, a house or a ring—of which we say there are no Forms. So it is clear that it is also possible for the others to be and to come to be through the same causes as the things mentioned just now.

Further, if indeed the Forms are numbers, in what way will they be causes? Is it because the beings are other numbers—for example, this number here man, this one here Socrates, and this one here Callias? If so, why are the one lot of numbers causes of the other lot? For even if one lot are eternal and the other not, it will make no difference. But if the things that exist here are ratios of numbers (for example, a musical concord), it is clear that there is at least one thing of which they are the ratios. If, then, this thing—the matter—is something definite, it is evident that the numbers themselves will also be some ratios of something to something else. I mean, for example, that if Callias is a ratio, expressible in numbers, of fire, earth, water, and air, it is also of certain other underlying things that his Form too will be a number. And man-itself, whether it is some sort of number or not, will nonetheless be a ratio, expressible in numbers, of certain things and not a number, and nor, because of this [argument], will any Form be a number.

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58. Anaxagoras' seeds are characterized as "unmixed before the start" (989a34–b1), and so are relevantly like separate Platonic Forms.
59. F174, 97.28–98.24.
60. Cf. Plato, *Cratylus.* 389a–b, *Republic* 596b, *Timaeus* 28c–29a.
61. I.e., the Form of a man.
62. 100d, 101c.

Further, one number may come to be from many numbers, but how can one Form come from many Forms? And if it does not come from them themselves but from the things that are in a number (for example, in the myriad), how will it be with the units? For if they are of the same Form, many strange things follow, as they also do if they are not of the same Form (whether the one lot as each other or all the lots as all the others[63]); for in which way will they differ, since they are without affections? For these results are neither reasonable nor consistent with our understanding [of units].

Further, they will have to introduce some other kind[64] of number (with which arithmetic is concerned), as well as all the things called "intermediates" by some thinkers. And how are these to exist and from what starting-points? Or why will they be intermediate between the things here and the things themselves?

Further, each of the units in the two comes from some prior two; and yet this is impossible.[65]

Further, why is number, when taken all together, one?[66]

Further, in addition to what has been said, if indeed the units are different,[67] Platonists should have spoken like those who say that the elements are four, or two (for each of those says not that what is common—for example, body—is an element, but rather fire and earth, whether [they think] there is something common to them—body—or not), but in fact they speak as if the one were uniform like fire or water. If this is so, however, the numbers will not be substances;[68] rather, it is clear that—if indeed there is some one-itself and it is a starting-point—things are said to be one in various ways.[69] That would be impossible otherwise.

When we wish to refer back substances to their starting-points, however, we posit that lines come from the short and the long (that is, from a certain sort of small and great), plane from broad and narrow, and solid from deep and shallow, and yet how, then, will either a surface have a line or a solid have a line and a surface? For the broad and narrow is a kind distinct from deep and shallow. So, just as number is not present in these, because the many and few are distinct from them, it is clear that none of the higher ones will be present in the lower ones. But then again broad is not a kind of deep either; for then a body would be a certain sort of plane.

Further, as for the points, from what will their presence in lines come? In fact, Plato used even to contest this kind as being a geometrical dogma. Instead, he called it "the starting-point of line," and often posited that it consisted of indivisible lines. And yet these lines must have some limit, so that from the argument on the basis of which a line exists, a point also exists.

63. 1081^{b}35–37.
64. Reading ἕτερον τι γένος.
65. 1083^{b}23–36.
66. 1082^{a}15–26.
67. 1084^{b}13–32.
68. 1081^{a}5–17.
69. 1053^{b}9–1054^{a}19.

In general, though wisdom inquires about the cause of perceptible things, we left this alone (for we say nothing about the cause from which change starts), and—thinking that we are stating the substance of these things—we say that they are yet other substances, but as for the way in which these are substances of those, we state it through empty words. For "participation," as we said previously,[70] means nothing.

As, then, for precisely the thing we see[71] to be the cause for the sciences, that because of which every understanding and every nature does things, the Forms in no way latch onto this cause either, which we say is one of the starting-points; instead, mathematics has become philosophy for the present thinkers, although they say that one should busy oneself with it for the sake of something else.

992[b]1 Further, the substance that is the underlying subject as matter one might suppose to be too mathematical, and to be more a predicate and a difference in the substance and of the matter than matter proper[72]—for example, the great and the small are like the rare and the dense that the natural scientists also speak about, calling these the "primary differences" of the underlying subject; for these are a sort of excess and deficiency.

And as for movement, if these things constitute movement, it is clear that the Forms will move. But if not, where does movement come from? In fact, the whole investigation concerning nature has been done away with.

And what seems to be easy, to prove that all things are one, does not come about; for by setting-out it does not come about that all things are one, but—if one grants all [their assumptions]—that there is some *one*-itself, and not even that, if one does not grant that the universal is a kind, which in some cases is impossible.

And there is no account of the lengths, surfaces, and volumes that come after the numbers, either of the way they are or will be or of what capacity they have; for these things cannot be Forms (for they are not numbers), or intermediates (for those are the objects of mathematics), or things that pass away, but appear to constitute another, fourth kind.

In general, to look for the elements of the beings without making distinctions, when they are said [to *be*] in many ways,[73] makes it impossible to find them, and especially if one looks in this way[74] for the sorts of elements they come from. For from what elements will doing or undergoing or straightness come? Surely, it is not possible to get hold of them, but if indeed it is possible, it is only for the elements of substances. So either to look for the elements of all the beings or to think that one has found them is incorrect.

And how could one even learn the elements of all things? For clearly one cannot start by already knowing something that is prior to them. For just as a person who

70. 991[a]20–22.
71. We Aristotelians, as at 992[a]29, not we Platonists as at 992[a]27.
72. 1088[a]15–21.
73. 1003[a]33, 5.7, 1026[a]33–[b]4, 1028[a]10–31, 1051[a]34–[b]6.
74. I.e., by setting-out.

is leaning geometry, though he may have prior knowledge of other things, has no prior knowledge of the things of which geometry is the science and about which he is trying to learn, so it is too, then, in the case of the other sciences, so that if there is a science of all things, of the sort some people say there is, a person who is to learn it should start by knowing nothing whatever. And yet all learning takes place through things of which there is prior knowledge, either of all of them or of some of them, that is, either through demonstrations or definitions (for one must have prior knowledge of the things from which the definition comes and they must be well-known), and similarly too in the case of learning through induction. But then again if such knowledge were in fact innate,[75] we might wonder how we could possess the most excellent of the sciences[76] without being aware of it. **993ª1**

Further, how could one come to know the things from which such knowledge comes, and how is this to be made clear? There is a puzzle about this too; for there might be a dispute about it, just as there is about certain voiced syllables; for some people say that ZA comes from S, D, and A, while others say that it is another sound, and not any of the well-known ones.[77]

Further, as for the things of which there is perception, how could one come to know them without having the relevant perception? And yet he would have to, if in fact these are the elements from which all things come, just as complex sounds come from the elements that properly belong to them.

1.10
Earlier Philosophy Reveals No Causes beyond the Four

That all thinkers seem to have been inquiring about the causes that were mentioned in the *Physics*, then, and that we cannot mention any outside these, is clear even from what was said previously. But [they touched upon] these indistinctly, and so in a way they have all been discussed before, and in a way they have not been discussed at all. For early philosophy seemed to speak inarticulately about all things, because it was young and at the starting-point, since even Empedocles says[78] that bone exists as a result of its ratio, and this is the essence and the substance of the thing. But then it is similarly necessary that flesh and each of the others should be its ratio, or that not one of them should. Therefore, it is because of this that both flesh and bone and everything else will exist, and not because of the matter, which he mentions—fire,

75. Plato, *Meno* 80d–81d.
76. I.e., theoretical wisdom ($982^{a}1$–3, $983^{a}11$).
77. The Greek letter *zeta* has two pronunciations, and so it is associated with two voiced sounds. One group claims that ZA is pronounced like S/DA, the other that it is a unique voiced sound, a phonetic element.
78. B96, B98 DK.

earth, water, and air. But while if someone else had said this, he would necessarily have agreed, he has not said it in a perspicuous way.

As regards such things,[79] then, we have also made our views clear previously.[80] But let us go back again to whatever one might puzzle over concerning these things themselves;[81] for maybe from these we might achieve something of a puzzle-free condition in connection with the later puzzles.

BOOK 2 (LITTLE ALPHA)[82]

2.1
The Primary Causes of the Beings and Our Understanding of Them

A theoretical investigation concerning the truth [of things] is in one way difficult and in another way easy. A sign of this is that while none is capable of touching upon it in a worthwhile way, neither do all completely fail to hit it, but rather each **993b1** has something to say about the nature [of things], and while taken individually they contribute little or nothing to it, a gathering together of all results is a contribution of some magnitude. So if indeed the truth is like the proverbial barn door that none can miss, in this way it would be easy, but the fact that we can have some grasp on the whole while being incapable of grasping the part indicates how difficult it is.[83]

Perhaps too, since difficulties occur in two ways, it is not in the things but in us that the cause of this one lies; for as the eyes of bats are to the light of day, so is the understanding in our souls to the things that are by nature most evident of all.

It is a just thing, however, to be grateful not only to those whose beliefs one shares, but also to those who have expressed more superficial views; for they have also contributed something; for they prepared the state [of the subject] for us; for if in fact there had been no Timotheus, there would be much lyric poetry that we would not possess, but if there had been no Phrynis, there would have been no Timotheus. It is the same way too with those who have expressed views about the truth [of things]; for from some thinkers we have received certain beliefs, while others caused these thinkers to become what they were.

It is correct too for philosophy to be called "scientific knowledge of the truth." For of theoretical science the end is truth, while of practical science it is work; for

79. I.e., the vague and imperspicuous ways in which "the first philosophy concerning all things" expressed itself about the starting-points and causes. Reading τοιούτων.
80. 1.3–9.
81. I.e., the starting-points and causes.
82. The odd title of this book has been taken to indicate the difficulty that the original editors of the *Metaphysics* had in understanding its place in the overall scheme of things.
83. *Ph.* 184a10–b14.

whenever practical people investigate how things stand, what they get a theoretical grasp on is the cause, not intrinsically but in relation to something and now. But we do not know the truth without the cause. Each [affection] belongs most of all to something when it is because of it that a synonymous affection also belongs to other things—for example, fire is the hottest thing; for in fact it is the cause of heat in other things. And so what is also most true is what causes all derivative things to be true. That is why the starting-points of the eternal beings must be most true (for they are not [merely] sometimes true, nor is there any cause of the being for them, but rather they themselves are a cause of it for the others), so that as each thing is as regards being, so it is too as regards truth.

2.2
There Must Be Some Starting-Point or Primary Cause of the Beings

But that there is some starting-point, and that the causes of the beings are neither **994a1** an unlimited series nor unlimited in form, is clear. For neither is it possible for one thing to come from another, as from matter, without limit (for example, flesh from earth, earth from air, air from fire, and so on without stopping), nor is it possible for the starting-point from which the movement comes to be such (for example, for a human being to be moved by air, air by sun, sun by strife, and so on without limit). Similarly, the for-the-sake-of-which cannot go on without limit either (for example, walking for the sake of health, this for the sake of happiness, and happiness for the sake of something else, and so one thing always being for the sake of another), and in the case of the essence it is the same way.

For of intermediate things [in a series], since there is a last one and a prior one, the prior one must be the cause of the things that come after it. For if we had to say which of the three was the cause, we would say the first; for it certainly is not the last, for the final one causes nothing. But then it is not the intermediate one either, for it is the cause of only one thing (and it makes no difference whether there is one intermediate thing or more than one, or whether they are unlimited or limited in number). But of series that are unlimited in this way, and of what is unlimited generally, all the parts are alike intermediate things down to now, so that if indeed there is no first one, there is no cause at all.

But the series cannot go downward in this way without limit either, with a starting-point above, so that from fire comes water, from water earth, and in this way some other kind of thing is always coming to be. For one thing comes from (*ek*) another in two ways (apart from that in which *ek* means "after," as in "the Olympic Games come *ek* the Isthmian"), either the way in which a man comes from a child by the child's changing or the way in which air comes from fire. A man is said to come from a child in the way that what has come to be comes from what is coming to be, or as the completed thing comes from the thing that is being completed; for there is

always an intermediate, so that just as between being and not being there is coming to be, so too the thing that is coming to be is between the thing that is and the thing that is not; for the person who is learning is coming to be someone with scientific knowledge, and this is what is meant when we say that from someone who is learning comes someone with scientific knowledge. But when something comes from another thing in the way that water comes from air, the other thing ceases to be. That is why the former sort is not reversible, and a child does not come from a man; for it is not what comes to be something that comes to be as a result of coming to be but what exists after the coming to be [is complete], and it is in this way too that the day comes from the morning, because it comes after the morning, which is why the morning does not come from the day. But the other sort is reversible. In both, however, it is impossible for them to go on without limit; for in the former sort the intermediates must have an end, and in the latter the change is reversible; for the passing away of either is the coming to be of the other.

At the same time, however, it is also impossible that the first [cause], since it is eternal, should pass away; for since coming to be is not without a limit in the upward direction, the first thing from whose passing away something came to be must be non-eternal.

And since the for-the-sake-of-which is an end, and the sort of end that is not for the sake of other things, but rather other things are for its sake, it follows that if there is to be a last thing of this sort, the series will not be without a limit, but if there is no such thing, there will be no for-the-sake-of-which. Those who make it unlimited are unwittingly getting rid of the nature of the good (and yet no one would try to do anything if he were not going to come to a limit). Nor would there be any understanding present in the beings; for someone who has understanding, at any rate, always does the actions he does for the sake of something,[84] and this is a limit; for the end is a limit.

But then neither can the essence be referred back to another definition that is fuller in account; for it is always that which comes before that is more a definition, and not that which comes after, and if the first one is not a definition, neither is the last. Further, those who speak that way do away with scientific knowledge; for it is not possible to have knowledge until one comes to indivisibles.[85] And there is no knowledge; for how can there possibly be understanding of what is unlimited in this way? For it is not like the case of a line, the divisibility of which does not stop, but which one cannot understand without making a stop.[86] That is why one who is traversing what is unlimited cannot count the cuts, but rather the whole line must be understood by something that does not move [from cut to cut].[87] Also, there can be

84. *NE* 1094a18–22, *EE* 1214b6–11.
85. *APo*. 79a33–36.
86. *Ph*. 247b11–13, *DA* 407a32–33.
87. Reading τὴν ὅλην οὐ κινουμένῳ. See 1075a5–10.

nothing that is unlimited, and if that is not so, the [definition of] what is unlimited is not unlimited, at any rate.

But then if the forms of cause were unlimited in number, knowledge would again be impossible; for we think we know when we know the causes, but what is unlimited by addition cannot be gone through in a limited time.

2.3
Diverse Modes of Argument

Lectures, however, produce their effects in accord with people's habits; for we expect them to be spoken in the manner we are accustomed to, and anything beyond this **995**[a]**1** appears not to have the same strength but to be something quite unknown and quite strange; for it is the customary that is familiar. Indeed, its extraordinary strength is indicated by our customs, where mythical and childish stories about things have greater power than knowledge about them, because of habit.

Some people, then, do not accept what someone says if it is not stated mathematically, others if it not based on paradigms, while others expect to have a poet adduced as a witness. Again, some want everything expressed exactly, while others are annoyed by what is exact, either because they cannot string all the bits together or because they regard it as nitpicking; for exactness does have something of this quality, so that, just as in business transactions, in the case of arguments too, it seems to have something unfree about it.

That is why one must already have been well educated in what way to accept each argument,[88] since it is absurd to look for scientific knowledge and for the way [of inquiry][89] characteristic of scientific knowledge at the same time—and it is not easy to get hold of either. And the argumentative exactness of mathematics must not be demanded in all cases, but only in the case of things that include no matter.[90] That is why the way of inquiry is not that characteristic of natural science; for presumably every nature includes matter.[91] That is why what nature is must first be investigated; for that way it will also be clear what natural science is concerned with, and whether it belongs to one science or to more than one to get a theoretical grasp on causes and starting-points.[92]

88. *PA* $639^{a}1$–15, *EE* $1216^{b}40$–$1217^{a}10$.
89. *APr.* $46^{b}36$, *Met.* $1005^{b}3$, $1025^{b}29$.
90. $1078^{a}9$–31.
91. $1025^{b}30$–$1026^{a}6$.
92. Reading καὶ . . . ἐστιν.

BOOK 3 (BETA)

3.1[93]
Puzzles (P1–14) about Primary Starting-Points and Causes

It is necessary, with a view to the science being inquired about, first to go over issues about which one should first raise puzzles. These include both issues about which people have supposed divergent things, as well as any separate from these that may have been overlooked. For those who wish to be puzzle-free it furthers the work to go through the puzzles well; for the subsequent puzzle-free condition is reached by untying the knots produced by the puzzles raised in advance, and it is not possible to untie a knot one is unaware of. But a puzzle in thought indicates the existence of a knot in the subject matter; for insofar as thought is puzzled it is much the same as people who are tied up; for in both cases it is impossible to move forward.

That is why one should look at all the difficulties beforehand, both for these reasons and because those who inquire without first going through the puzzles are like people who do not know where they have to go. And, in addition, a person [who has not already looked at the puzzles] does not even know whether[94] he has found what he is inquiring about; for to someone like that the end is not clear, while to a person who has gone through the puzzles beforehand it is clear. Besides, a person is necessarily in a better position to make a judgment when—as if they were opposing parties in a court case—he has heard all the contending arguments.

[P1] The first puzzle is concerned with the issues we went through the puzzles about in our prefatory remarks,[95] whether it belongs to one science or to more than one to get a theoretical grasp on causes.

[P2] And whether it is only the primary starting-points of substance that science has to look at, or whether it is also concerned with the starting-points on which everyone depends when proving things—for example, whether or not it is possible to affirm and deny one and the same thing at the same time, and other such starting-points.

[P3] And if it is concerned with substance, whether there is one science concerned with all of them or more than one, and if more than one, whether they are all of the same kind or some of them must be called "sorts of wisdom" and others something else.

[P4] And this itself is also one of the things that it is necessary to inquire about—whether only perceptible substances should be said to exist or also others beyond these, and [if so] whether there is one kind of these substances or several kinds, as

93. The puzzles listed in 3.1–2 as P1, P2, . . . are in many cases returned to in 11.1–2, where they are listed as P_1, P_2, ... The numberings of the two lists do not always exactly correspond.
94. Reading οὐδ' εἴ ποτε.
95. Books 1 and 2.

is supposed by those who introduce both the Forms and the objects of mathematics that are intermediate between them and the perceptibles.[96]

[P5] These, then, as we say, must be investigated, and also whether the theoretical investigation [we are discussing] is concerned with substances only or also with the intrinsic coincidents of substances. In addition, concerning same and other, like and unlike, and contrariety, and concerning prior and posterior, and all the other things of this sort that dialecticians try to investigate, making their investigation on the basis of acceptable beliefs only—whose task is it to get a theoretical grasp on all these? Further, on the intrinsic coincidents of these very things, and not only what each of them is, but also whether one thing is the contrary of one thing.

[P6] Also, on whether the starting-points and elements are the kinds or the components present in each thing, into which it is divided.

[P7] And if they are the kinds, whether they are the first ones or the ultimate ones that are said of indivisible things—for example, whether animal or human is a starting-point and is to a higher degree beyond what is particular.

[P8] Above all, one must inquire about and must study whether or not there is something,[97] beyond the matter, that is an intrinsic cause, whether or not this is separable, whether it is one or more than one in number, and whether there is something beyond the compound (I mean by "the compound" whenever something is predicated of matter) or nothing, or whether for some there is, while for others there is not, and what sorts of beings these are.

[P9] Further, whether the starting-points are definite in number or in form, both those in the accounts and those in the underlying subject. **996^{a}1**

[P10] Also, whether the starting-points of what passes away and of what does not pass away are the same or distinct, and whether none of them passes away or those of things that pass away do pass away.

[P11] Further, the most difficult of all and the one involving the most puzzles—whether one and being are not, as the Pythagoreans and Plato used to say, another thing, but rather the substance of the beings, or whether this is not so but the underlying subject is another thing, which Empedocles says is love, someone else, fire, someone else, water or air.

[P12] Also, whether the starting-points are universal or like particular things.

[P13][98] Further, whether they are [causes] potentially or actively, and further whether they are [causes] in any other way than as regards movement; for these issues too cause much puzzlement.

[P14] In addition, whether or not numbers, lines, figures, and points are substances of some sort or not, and if they are substances, are they separate from the perceptible ones or components present in them?

96. 987^{b}14–18.
97. I.e., the form.
98. No parallel in Book 11.

For concerning all these not only is it difficult to be in puzzle-free possession of the truth but it is not easy even to go through the puzzles well in the account.

3.2
Discussion of P1–5

[P1] The first, then, concerns the things mentioned first, whether it belongs to one science or to more than one to get a theoretical grasp on all the kinds of causes. For how could it belong to one science to know the starting-points if these are not contraries?[99]

Further, to many of the beings not all the starting-points pertain; for in what way can there be a starting-point of movement for immovable things?[100] Or in what way can the nature of the good be such a starting-point, if indeed everything that is good intrinsically and because of its own nature is an end and a cause in this way, that for its sake the other things both come to be and are, and if the end—that is, the for-the-sake-of-which—is an end of some action, and all actions involve movement? So in the case of immovable things this starting-point could not exist, nor could there be any good-itself. That is why in mathematics too nothing is proved through this cause, nor is there any demonstration where the cause is this: because it is better or worse. Indeed, no one mentions any such thing at all, so that, because of this, some of the Sophists—for example, Aristippus—used to shower abuse on mathematics; for in the other crafts, even manual ones like carpentry and shoemaking, the cause is always stated in terms of better or worse, while the mathematical sciences take no account of good and bad things.[101]

996b1 But then if there are several sciences of the causes, and a distinct one for each starting-point, which of them must one say is being inquired about? Or which of those who possess these sciences must one say has the highest degree of scientific knowledge of the object of the inquiry? For it is possible for all the ways of being causes to pertain to the same thing—for example, in the case of a house the source of the movement is the craft or the builder, the for-the-sake-of-which is the work,[102] the matter is earth and stones, and the form is the account. Based on our earlier determinations[103] about which of the sciences should be called "wisdom," then, there is reason to apply the term to each; for insofar as wisdom is most ruling and most leading, and insofar as, like with handmaidens, it is not just for the other sciences ever to contradict it, it is the science of the end and of the good that is of the same sort as wisdom (for other things are for the sake of the end and the good). And insofar as

99. I.e., not in the same kind. See *Cat.* 14a19–20.
100. Rejecting the addition of ἐν.
101. 1078a31–b5, *PA* 641b10–12.
102. 1050a21–22.
103. 982a8–19.

wisdom was determined[104] to be about the primary causes and about what is most scientifically knowable, it is the science of substance that would be of the same sort as it; for since people may scientifically know the same thing in many ways, we say that the person who knows what the thing is by its being knows it better than the person who knows it by its not being, and of those who know it better some know it better than others, and the person who knows it best is the person who knows its what-it-is, not the person who knows [merely] its quality or quantity or what it can naturally do or have happen to it. Further, in other cases too, even those of which there are demonstrations,[105] we think that there is knowledge of each thing when we know what-it-is—for example, what squaring a rectangle is, that it is the finding of a mean, and similarly in other cases. And about comings to be and actions, and about every sort of change, we think there is knowledge when we know the starting-point of the movement; but this is distinct from and opposed to the end, so that it might seem that for each of these causes it belongs to a distinct science to get a theoretical grasp on it.

[P2] But then about the starting-points of demonstration too, and whether there is one science of them or more than one, there is dispute (by "the starting-points of demonstration" I mean the common beliefs on the basis of which we all prove things, such as that in every case it is necessary either to affirm or deny, and that it is impossible for something at the same time to both be and not be, and any other propositions like that), about whether there is one science of these and of substance or distinct ones, and, if it is not one science, which of the two should be identified with what is being inquired about now?

For there to be one science of them is not reasonable; for how is it more special to geometry than to any science whatever to comprehend them? So if indeed it belongs to every science alike to comprehend them, but cannot belong to all [as their special subject], then, just as it is not special to the others, neither is it special to the science that knows substances to know about them. At the same time, indeed, in what way can there be a science of them? For what each of them in fact is we know even now—at any rate, even the various crafts make use of them as things that are known. But if there is a demonstrative science[106] concerned with them, there will have to be some hypothesized kind, as well as affections, on the one hand, and axioms pertaining to them, on the other (for it is impossible for there to be demonstrations of everything), for demonstration is necessarily from some things, about some things, and of some things. So it follows that all provable things belong to some one kind, for all demonstrative sciences make use of the axioms.

But then if the science of substance and the science concerned with the axioms are distinct, which of them naturally has more control and is prior? For it is the

104. 982^{a}30–^{b}2.
105. Reading καὶ ὧν ἀποδείξεις εἰσί.
106. *APo*. 76^{b}11–22.

axioms that are most universal and the starting-points of all things, and if not to the philosopher, to whom does it belong to get a theoretical grasp on what is true and what is false about them?[107]

[P3] And, in general, as regards substances, is there one science of all of them or more than one? If there is not just one, to what sorts of substance must this science be assumed to pertain? But it is not reasonable that there should be one of all of them; for then there would also be one demonstrative science of all [intrinsic] coincidents—if indeed every demonstrative science gets a theoretical grasp on the intrinsic coincidents of some underlying subject on the basis of the common beliefs. Therefore, to get a theoretical grasp on the intrinsic coincidents of the same kind on the basis of the same beliefs belongs to the same science. For of the "what about" there is one science and of the "on the basis of which" there is one science too (whether the same one or a distinct one), and so the coincidents are also theoretically grasped either by these sciences or by one composed of them.

[P5] Further, is the theoretical investigation concerned with substances alone or also with their [intrinsic] coincidents? I mean, for example, if the solid is a sort of substance and so are lines and planes, does it belong to the same science to know these and the [intrinsic] coincidents of each kind, of which the mathematical sciences provide proofs, or to another science? If to the same one, the science of substance would also be a demonstrative science, but there does not seem to be a demonstration of the what-something-is. But if it belongs to another science, which of them is going to get a theoretical grasp on the [intrinsic] coincidents of substance? This is a very difficult question.

[P4] Further, must only the perceptible substances be said to exist, or also others beyond these? And is there one kind or are there in fact several kinds of these substances—as those say who assert the existence both of the Forms and of the intermediates, with which they say the mathematical sciences are concerned? The way in which we say that the Forms are both causes and intrinsically substances has already been stated in our first accounts of them.[108] But while Forms involve difficulties in many places, none is stranger than to say that there are certain natures beyond those in the heaven as a whole, and that these are the same as perceptibles, except that they are eternal while the latter pass away; for they say that there is man-itself and horse-itself and health-itself, and nothing else—much the same as those who introduce gods, but say that they are human in form; for those people were making the gods nothing but eternal human beings, and these are making the Forms nothing but eternal perceptibles.

Further, if beyond the Forms and the perceptibles someone is going to posit the intermediates, he will face many puzzles; for it is clear that there will be lines beyond the lines themselves and the perceptible lines, and similarly with each of the other

107. Answered at 1005b5–8.
108. 1.6, 1.9.

kinds. So if indeed astronomy is one of the mathematical sciences, there will also be a heaven beyond the perceptible heaven, as well as a sun and a moon, and similarly with the other bodies throughout the heaven. And yet how is one to be persuaded of these things? For a thing of this sort to be immovable is not reasonable, but for it to be moving is altogether impossible. It is the same way for the things that optics busies itself with and those in harmonics; for in fact it is impossible—due to the same causes—for them to be beyond the perceptibles; for if there are intermediate perceptibles and perceptions, it is clear that there will also be animals that are intermediate between the animals themselves and those that pass away.[109]

But one might also raise this puzzle: with regard to which sorts of beings should one look for these sciences [of intermediates]? For if geometry is to differ from measurement only in this respect, that measurement is of things we perceive, while geometry is not, it is clear that there will also be a science beyond medicine (and beyond each of the others), intermediate between medicine-itself and the medicine for the things that exist here. And yet how is this possible? For there would also have to be healthy things beyond the perceptible ones and the healthy-itself. At the same time, not even this is true, that measurement is of perceptible magnitudes that pass away; for it would then pass away when they did.

But then [geometry] would not be concerned with perceptibles either, nor would astronomy be concerned with the heaven that is here. For perceptible lines are not the way a geometer says lines are; for no perceptible thing is straight or round in the way he says they are; for a circular hoop makes contact with a ruler not at a point but [along a line,] as Protagoras used to say it did when refuting the geometers—nor are the movements and spirals of the heaven like those about which astronomy produces its accounts, nor do points have the same nature as stars.

There are some,[110] however, who say that these so-called intermediates between the Forms and the perceptibles exist, although not separate from perceptibles, at any rate, but rather in them. To go through all the impossible consequences of these views would require too long an account. It is enough to get a theoretical grasp even on the following ones: It is not reasonable, after all, that this should hold only of the intermediates; rather, it is clear that the Forms too might exist in the perceptibles; for the same argument applies to both of them. Further, it follows that two solid things are necessarily in the same place, and that [the intermediates] are not immovable, since they, at any rate, are in things that are moving—namely, perceptibles. And, in general, for the sake of what would someone posit that they exist but that they exist in perceptibles? For the same strange consequences will follow that have already been

109. The intermediate perceptibles, as different from the familiar ones, would have to be detected by perceptual modalities other than the familiar five, since perceptual modalities are individuated and defined by their objects (*DA* $415^{a}14$–22). These new intermediate perceptual modalities, in turn, would have to be possessed by new intermediate animals.

110. Reference unclear. Perhaps the Pythagoreans.

mentioned, that there will be a heaven beyond the heaven, only not separate from it, but rather in the same place—which is precisely what is more impossible.

3.3
Discussion of P6–7

[P6] As regards these issues, then, there is much puzzlement both about the way things should be put in order to hit on the truth, and about the starting-points, whether it is the kinds that should be supposed to be elements and starting-points or, rather, the primary components present in each thing. For example, the elements and starting-points of voiced sound seem to be those primary things from which voiced sounds are composed, not the common [kind]—voiced sound. And we speak of the elements of diagrams as those things whose demonstrations are present in the demonstrations of the other things, either of all of them or of most. Further, both those who say that there are several elements of bodies and those who say that there is one speak of the things from which a body is composed as starting-points. For example, Empedocles says that fire, water, and those that come after these are elements present in the beings from which these beings are composed, but does not speak of these as kinds of beings. In addition to this, if one wishes to examine the
998b1 nature of other things (for example, a bed), when one knows the parts from which it is composed and the way they are arranged, one knows its nature. On the basis of these arguments, then, the kinds would not be the starting-points of the beings.

But insofar as[111] we know each thing through definitions, and the kinds are the starting-points of definitions, it is necessary for the kinds too to be the starting-points of the definable things. And if to get scientific knowledge of the beings is to get it of the forms in accord with which the beings are said [to be what they are], the kinds are starting-points, at any rate, of the forms. And some even of those who speak of one or being or the great and small as elements of the beings apparently treat them as kinds.

But then neither is it possible to speak of the starting-points in both ways. For the account of the substance is one, while the definition by means of kinds will be distinct from the definition that states the components present in a thing.

[P7] In addition to this, even if it is the kinds that are to the highest degree starting-points, is it the primary kinds that one should acknowledge as starting-points or the ultimate ones, which are predicated of the indivisibles? For this too admits of dispute. For if the universal ones are always to a higher degree starting-points, it is evident that the highest of the kinds [will be to the highest degree starting-points]; for they are said of all things. There will then be as many starting-points of the beings as there are primary kinds, and so being and one will be starting-points and substances;

111. Reading ᾗ̂.

for these are to the highest degree said of all the beings.[112] But it is not possible that either one or being should be a single kind of the beings; for it is necessary for the differences in each kind to each both be and be one, but it is impossible either for the forms of the kind to be predicated of their own proper differences or for the kind to be predicated without its forms. So if indeed one is a kind or if being is, no difference will either have being or be one. But then if they are not kinds, neither will they be starting-points, if indeed the kinds are the starting-points.

Further, the intermediate ones, taken together with the differences, will also be kinds, down to the indivisible ones, but as things stand some seem to be kinds and others do not. In addition to this, the differences will be starting-points to a still higher degree than the kinds. But if these too are starting-points, the starting-points become (one might almost say) unlimited in number, especially if one assumes the primary kind as a starting-point. But then, if one, at any rate, is to a higher degree **999^{a}1** the form of thing to be a starting-point, and what is indivisible is one thing, and everything that is indivisible is so either in quantity or in form, and what is so in form is prior, and the kinds are divided into forms, the ultimate kind predicated of a thing would be to a higher degree one; for the human being is not the kind of certain human beings.

Further, in the case of things among which there is priority and posteriority, what is over them cannot be something beyond them. For example, if two is the first of the numbers,[113] no number will exist beyond the forms of numbers. Nor, similarly, will there be a [geometrical] figure beyond the forms of figures. But if not of these things, there will hardly be kinds beyond the forms of other ones; for of these above all there seem to be kinds.[114] (But among the indivisibles,[115] one is not prior and another posterior.) Further, where one thing is better and another worse, the better is always prior, so that of these also there would not be a kind.

On the basis of these considerations, then, those predicated of indivisibles appear to be starting-points rather than the [primary] kinds. But again, in what way one should suppose these to be starting-points is not easy to say. For the starting-point, or the cause, must exist beyond the things of which it is a starting-point and must be capable of existing as separated from them. But why should one suppose any such thing to exist beyond the particular things, besides the fact that it is predicated universally and of all of them? But again if it is because of that, one must assume the more universal ones to be starting-points to a higher degree; so the primary kinds would be starting-points.

112. Reading τῶν ὄντων.
113. Since it is the first plurality ($1056^{b}25$–27, $1085^{b}10$).
114. $999^{a}6$–12 is thought to be part of a fragment of Xenocrates (F41 Isnardi).
115. Individuals, not indivisible forms.

3.4
Discussion of P8–11

[P8] Connected with these there is a puzzle, most difficult of all and most necessary to get a theoretical grasp on,[116] to which the account now turns. For if nothing exists beyond the particular things, and the particular things are unlimited in number, how is it possible to get scientific knowledge of unlimited many things? For it is insofar as they are one and the same thing, and insofar as something universal belongs to them, that we know all things.

But then, if this is necessary, and there must exist something beyond the particulars, it will be necessary that the kinds exist beyond the particulars—either the ultimate kinds or the primary ones. But we just went through a puzzle[117] concerning the impossibility of this. Further, if something exists most of all beyond the compound (I mean by "compound" whenever something is predicated of the matter)—if it exists, is it beyond all of them [that is, all the compound things] that it must exist, or beyond some but not others, or beyond none?

999b1 If nothing exists beyond the particular things, there will be nothing intelligible, but all will be perceptible, and there will be no scientific knowledge of anything, unless someone says that perception is scientific knowledge. Further, nothing will be either eternal or immovable; for all perceptibles pass away and are in movement. But then, if nothing is eternal, neither is it possible for anything to be a coming to be. For there must be something that comes to be and something from which it comes to be, and of these the last one cannot have come to be, if indeed there is a stopping point and if coming to be from not being is impossible. Further, if coming to be and movement exist, there must also be a limit; for no movement is unlimited, but every one has an end, and what cannot come to be cannot be coming to be, and what has come to be must be at the first moment it has come to be. Further, if indeed the matter exists because it cannot have come to be, it is yet much more reasonable that the substance—the thing that matter is coming to be—should exist; for if neither the substance nor the matter is to exist, nothing at all will exist. And if that is impossible, something must exist beyond the compound, namely, the shape—that is, the form.

Again, if one is to posit this, there is a puzzle: in which cases is one to do so and in which not? For that one cannot do so in all cases is evident; for one could not posit a house that is beyond the particular houses. In addition to this, will the substance of all things be one—for example, of all men? But that would be strange; for all those things are one of which the substance is one. But are they[118] then many and different?

116. P11 (1001a4–5) and—by implication—P10 (1000a5–6) are also singled out as especially difficult.

117. P7.

118. I.e., entities such as man-itself, which are the substance of a corresponding many. So if these are many and different, then there will be man-itself$_1$, man-itself$_2$, and so on.

But this too is unreasonable. At the same time, in what way does the matter come to be each of these things, and in what way is the compound both of these things?[119]

[P9] Further, about the starting-points, one might also raise this puzzle. If they are one in form,[120] nothing will be one in number, not even the one-itself and being. And how will there be scientific knowledge, if there does not exist something that is a one over all?

But then, if they are one in number, that is, if each of the starting-points is one, and not, as in the case of perceptibles, different for different perceptibles (for example, the starting-points of this syllable, which is the same in form [as that], are also the same in form and [not in number]; for in fact they belong to syllables that are distinct in number)—if they are not one in the latter way, but instead the starting-points of the beings are one in number, nothing else will exist beyond the elements; for whether one says "one in number" or "particular" makes no difference; for by "particular" we mean one in number, and by "universal" we mean what is over particulars. So it is just like this: if the elements of voiced sound were definite in number, it would be necessary for all of literature to amount to the number of these elements, since there could not, at any rate, be two or more of the same ones.

[P10] No less a puzzle than any has been passed over both by people now and by previous ones, whether the starting-points of things that can pass away and things that cannot pass away are the same or distinct. For if they are the same, how is it that some things can pass away, while others cannot pass away, and due to what cause?

The followers of Hesiod and all the theologians thought only of what was persuasive to themselves, but had contempt for people like us; for they made the starting-points to be gods and what is born from gods, and say that those who did not taste nectar or ambrosia became mortal, clearly using terms familiar to themselves. And yet about the very ingestion of these causes they have spoken over our heads; for if it is for the sake of pleasure that the gods touch these, nectar and ambrosia are in no way the causes of their being; but if these are the causes of their being, how could the gods be eternal, since they need nourishment?

In the case of myth-like sophistries a serious investigation is not worthwhile, but one should cross-question those who use the language of demonstration to learn from them why precisely from the same things come, on the one hand, the beings that are eternal in nature and, on the other, the beings that pass away. But since they neither mention a cause nor is it reasonable that things should be this way, it is clear that the starting-points and causes of these things cannot be the same. For even the very person one might think speaks most consistently, Empedocles—even he suffers from the same deficiency; for he posits a starting-point, strife, as a cause of passing away, but this would seem to be no less a cause of coming to be [for everything] apart

119. I.e., both matter and form.
120. 1016^{b}36.

from the one; for from strife come all the other things except the god. At any rate, he says,

> From which all things—those that were, those that are, those that will be hereafter[121]—
> Trees, and men and women, took their growth,
> and beasts and birds and water-nourished fish,
> and long-aged gods.[122]

1000[b]**1** But quite apart from these lines it is clear; for if strife had not been present in things, all things would have been one, as he says; for whenever these come together, "strife was taking a stand at the lastmost place."[123] That is also why it follows for him that the happiest god is less wise than the others; for he does not know all things; for he does not have strife [in him], and knowledge is of like by like. "For by earth," he says,

> we see earth, by water, water,
> By ether, divine ether,
> By love love, and strife by baneful strife.[124]

But—and this is the place from which our account began—this is evident, at least, that it follows for him that strife is no more the cause of passing away than of being, nor love likewise the cause of being, for by bringing the other things together into the one it causes them to pass away. And at the same time he says nothing about the cause of the changeover itself, except that it is naturally that way:

> But when great strife was nourished in the limbs [of the sphere],
> He leapt up to claim his office as the time was fulfilled,
> Which had been fixed for their exchange by a broad strong oath,[125]

as if it were necessary for there to be a changeover. But he makes no cause of the necessity clear. Nonetheless, thus far at least he alone does speak consistently; for he does not make some of the beings capable of passing away and others incapable of passing away, but makes all of them capable of passing away, except the elements. But the puzzle now being spoken about is why one lot is one way and the other the other, if indeed they come from the same starting-points.

As regards the fact that the starting-points [of the two] cannot be the same, then, let that much be said. But if there are distinct starting-points, one puzzle is whether these too will be incapable of passing away or capable of passing away. For if they

121. Reading ὅσα τ' ἦν ὅσα τ' ἔσθ' ὅσα τ' ἔσται ὀπίσσω.
122. B21 DK.
123. B36 DK.
124. B109 DK (*DA* 404[b]13–15).
125. B30 DK.

can pass away, it is clearly necessary for these also to come from certain things; for all things that pass away do so into the things they come from. So it follows that other starting-points are prior to the starting-points. But this is impossible, both if the series comes to a stop and if it goes on without limit. Further, what way will things that can pass away be, if their starting-points are to be done away with? But if the starting-points cannot pass away, due to what will things that can pass away come from these things that cannot pass away, while from the other ones it is things that cannot pass away? For this is not reasonable—on the contrary, either it is impossible or it would require much argument. Further, no one has even tried to posit other starting-points [for the two sorts of things]; instead, they say that the starting-points of all things are the same. But they sidestep the first puzzle as if they took it to be something trivial.

[P11] Among all of the puzzles, however, and the one it is also most difficult to get a theoretical grasp on, and most necessary for knowledge of the truth, is whether being and one are really substances of the beings, and whether each of them is—not by being another thing—one and being respectively, or whether one should inquire about what being really is and what one really is on the supposition that some other nature underlies them as subject. For some people think their nature is of the former sort, others of the latter sort. For Plato and the Pythagoreans[126] think that neither being nor one is another thing, but that this is what the nature of each of them is, on the supposition that the substance of it is to be one or to be being. Those concerned with nature, however, [take the latter view]. For example, Empedocles—supposing that he was leading it back to something more familiar—says what the one is; for he would seem to say that love is something of this sort. At any rate, this is for all things the cause of their being one. But other people say that fire, and others that air, is the one and the being in question, from which the beings are and have come to be. Those who posit a plurality of elements also hold the same view; for they too must say that one and being are precisely as many as the starting-points that they say exist.

However, if one does not assume that one and being are some sort of substance, it follows that none of the other universals exists either; for these are the most universal of all. And if there is not some one-itself and being-itself, there would scarcely be any others that are beyond the so-called particulars. Further, if one is not substance, it is clear that number would not exist either as a nature separated from the beings; for number is composed of units, and the unit is precisely what a certain sort of one is. But if there exists some one-itself and being-itself, one and being must be their substance; for it is not another thing that is predicated of them, but these themselves.

But then if there is to be some being-itself and one-itself, there is much puzzlement as to how anything else will exist beyond these—I mean, as to how the beings will be more than one. For what is other than being is not, so that, according to Parmenides' argument, it necessarily follows that all the beings are one, and this one is being.

126. $987^{a}13$–19.

1001b1 Either way, it is difficult; for whether one is not substance or whether there is some *one*-itself, number cannot be substance. Why this holds if one is not substance was stated previously; but if it is substance, the puzzle is the same as that concerning being. For from what, beyond the one-itself, will there be another one? For it must be not one. But all the beings are either one or a many of which each is one.

Further, if the one-itself is indivisible, according to Zeno's axiom it would be nothing; for what neither makes larger when added nor smaller when subtracted, he says, has no being—on the supposition, clearly, that a being is a magnitude, and that if it is a magnitude, it is corporeal; for body has being in every [dimension], while other things—for example, a plane and a line—will make larger when added in one way, but when added in another way will not do so, but a point and a unit in no way make something larger. But since he gets a theoretical grasp on the matter in a crude way, and it is possible for something indivisible to exist, so against him too there is some defense; for something indivisible will not make a larger magnitude by being added, but will make a larger number. Yes, but how from a one of the relevant sort, or from several such ones, will a magnitude come? For it is like saying that a line comes from points.

But then, even if one supposes the case to be such that, as some people say, number comes from the one-itself and from something else that is not one, nonetheless one must inquire about why and how what comes to be is sometimes a number and sometimes a magnitude, if indeed the not one in question was the unequal and was the same nature [in both instances]. For that there is no way in which magnitudes could come to be from one and this nature, or from some number and this nature, is clear.

3.5
Discussion of P14

[P14] Following these issues is a puzzle as to whether numbers, bodies, planes, and points are substances or not.[127] For if they are not, it escapes us what being is and what the substances of the beings are; for affections, movements, relatives, dispositions, and ratios do not seem to signify the substance of anything; for all are said of some underlying subject and none is a this something. And, as for the things that would seem most of all to signify substance, water and earth and fire and air, from **1002a1** which composite bodies are composed, heat and cold and the like are affections of these, not substances, and only the body possessed of these affections persists as a sort of being, that is, a sort of substance. But then body is certainly substance to a lesser degree than surface, surface than line, and line than unit and point; for it is by these that body is defined, and it seems possible for them to exist without body but

127. In the list of puzzles given in 3.1, P14 (996a13–15) has a second component.

impossible for body to exist without them. That is why, while most thinkers and the earlier ones thought that substance and being were body and that other things were affections of this, so that the starting-points of bodies were also the starting-points of the beings, later and seemingly wiser thinkers[128] thought that these were numbers. As we said, then, if these are not substances, there is no substance or being at all—for the coincidents of these, at any rate, certainly do not deserve to be called "beings."

But then, if it is agreed that lines and points are substance to a higher degree than bodies, but we do not see to what sort of bodies they might belong (for it is impossible for them to be in perceptible ones), no substance would exist at all. Further, it is evident that all these things are divisions of bodies—one in breadth, one in depth, one in length.

In addition to these, any shape whatever is present in the solid in the same way, or else none at all is. Thus if Hermes is not present in the stone, neither is the half of the cube present in the cube as something definite; therefore, neither is the surface; for if any surface whatever were present, so too would be the surface that determines the half. And the same argument also applies to line, point, and unit. Thus if body is in the highest degree substance, and these divisions are so more than body is, but these do not exist nor are they certain substances, it escapes us what being is, and what the substance of the beings is.

In addition to what has been said the consequences that follow concerning coming to be and passing away are unreasonable. For it seems that substance, whether it did not exist earlier but does exist now or existed earlier but does not exist later, undergoes these through coming to be and passing away. But points, lines, and surfaces neither admit of a process of coming to be nor of passing away, though at one time they exist and at another do not. For when bodies make contact or are divided, at one time (when they make contact) there immediately comes to be one surface, while at another time (when they are divided) there immediately come to be two, so that when they are put together one surface does not exist, but has passed away, while when they are divided, surfaces exist that did not exist earlier (for it certainly is not that an indivisible point has been divided into two). And if they come to be and pass away, from what do they come to be? The case is also much the same as that of the now in time,[129] since it does not admit of coming to be or passing away either, yet it seems to be always something else nonetheless, because it is not a sort of substance. It is clear that it is similar in the case of points, lines, and planes. For the argument is the same; for they are in a similar way either limits or divisions.

128. Pythagoreans and Platonists. Strictly speaking the Pythagoreans were "among these thinkers [the materialists] and before them" ($985^{b}23$), whereas the Platonists alone were later ($987^{a}29$).

129. *Ph*. $233^{b}33–35$.

3.6
Discussion of P12, P13, P14a

[P14a][130] In general, one might raise a puzzle as to why it is even necessary to look for other things beyond perceptibles and intermediates, such as the Forms that we[131] posit. For if it is because of this that the objects of mathematics, while they differ from the things here in some other respect, in there being many of the same form they do not differ at all, so that their starting-points will not be definite in number (just as the starting-points of the writings that exist here are not definite in number either, although they are so in form—provided one does not take the starting-points of this syllable here or of this voiced sound here, since of these the starting-points will be definite in number too—and similarly too in the case of the intermediates; for things of the same form are unlimited in number there as well). Thus if there are not, beyond perceptibles and the objects of mathematics, other things such as some people say the Forms are, there will not be substance that is one in number, but in form, nor will the starting-points of the beings be so-and-so many in number, but in form.[132] So, if this is necessary, it is also necessary because of it to posit that the Forms exist. For even if those who say this do not articulate it well, still this is what they mean, at least, and it is necessary for them to say these things, because each of the Forms is a sort of substance and none exists coincidentally.

But then, if we are to posit both that the Forms exist and that the starting-points are one in number, not in form, we have said[133] what impossibilities necessarily follow.

[P13] Closely connected with these issues is going through the puzzles about whether the elements are [causes] potentially or in some other way. For if it is in some other way, something else will be prior to the starting-points (for the capacity is prior to that other cause, and not all of what is capable of being in a certain way is in that way). But if the elements are [causes] potentially, it is possible that none of the other beings should exist; for even what is not still has the potentiality to be, for what is not [yet] does come to be, while none of the things that lack the potentiality to be comes to be.

[P12] So we must go through both these puzzles about the starting-points and ask whether they are universal or exist as we say particulars do. For if they are universal,

130. P14a is not listed in 3.1 and is not discussed elsewhere in *Met*. The argument seems to be this: (1) Perceptibles and intermediates resemble each other in that there are indefinitely many of each that are the same in form—many men, many triangles. (2) Therefore, their starting-points will also be indefinitely many. (3) By the same token, there will not be a substance that is one in number, since each of the substantial starting-points is one in form but many in number. (4) So there must be some one Form over the many perceptibles or intermediates, if there are to be so-and-so many substantial starting-points each of which is one in number.

131. I.e., we Platonists.

132. Reading ἀλλ᾽ εἴδει.

133. The reference could be to the discussion in 1.6 and 1.9 or to P9 in 3.4.

they will not be substances (for no common thing signifies a this something but a such-and-such sort of thing, while substance is a this something). And if we are to be allowed to posit that what is predicated in common is a this something and can be set-out,[134] then Socrates will be many animals,[135] himself and the human and the animal, if indeed each of these signifies a this something and one thing.

If, then, the starting-points are universals, these things follow. But if they are not universals, but [exist] as particulars, they will not be scientifically knowable; for the scientific knowledge of all things is universal. Thus there will be other starting-points prior to the starting-points, those that are predicated universally, if indeed there is going to be scientific knowledge of these.

BOOK 4 (GAMMA)

4.1
The Science of Being qua Being versus the Special Sciences

There is a science that gets a theoretical grasp on being qua being[136] and of the [coincidents] belonging intrinsically to it. But this is not the same as any of the so-called special sciences; for none of these investigates being qua being in a universal way. Rather, each cuts off a part of being and gets a theoretical grasp on what is a[n intrinsic] coincident of that part—as, for example, the mathematical sciences do. But since we are inquiring about the starting-points and the highest causes, it is clearly necessary that these are a certain nature's as it is intrinsically. So if those who were inquiring about the elements of the beings were inquiring about these same starting-points, it is necessary that the elements too must be elements of being, not coincidentally but qua being. That is why it is of being qua being that we must grasp the primary causes.

4.2
The Many Ways in Which Something Is Said to Be

Something is said to *be* in many ways, however, but with reference to one thing and one nature—that is, not homonymously. Rather, just as what is healthy all has reference to health, one by safeguarding it, another by producing it, one by being a sign of health, another because it is a recipient of it, and what is medical all has reference to the craft of medicine (for one thing is said to be medical by possessing the craft of **1003^{b}1**

134. Reading ἐκθέσθαι.
135. Reading ζῷα.
136. I.e., insofar as it is being.

medicine, another by being naturally well-disposed to it, another by being a result of the craft of medicine), and we will find other things that are said to *be* in ways similar to these, so too something is said to *be* in many ways, but all with reference to one starting-point; for some things are said to *be* because they are substances, others because they are affections of substances, others because they are a route to substance, or else by being passings away, privations, or qualities of substance, or productive or generative either of substance or of things that are said to *be* with reference to substance, or negations of one of these or of substance (that is why we say even of not being that it *is* not being).

And so just as of all healthy things there is one science,[137] so it is in the case of the others too. For not only in the case of things that are said to *be* in accord with one thing does it belong to one science to get a theoretical grasp on them, but also in the case of things that are said to *be* with reference to one nature; for even these are in a way said to *be* in accord with one thing. So it is clear, in the case of the beings too, that it belongs to one science to get a theoretical grasp on them qua beings. In every case, however, a science in the strict sense is of what is primary, and on which the other things depend, and because of which they are said to *be*. So if this is substance, it will be of substances that the philosopher must possess the starting-points and causes.

Of every kind that is one, there is both one perception and one science—for example, grammar, which is one science, gets a theoretical grasp on all words. That is why to get a theoretical grasp on all the forms of being qua being belongs to a science that is one in kind, and to the forms of that science to get such a grasp on their forms. {If, then, being and one are the same and one nature, in that they follow along with each other, just as starting-point and cause do, but not in that they are indicated by one account (it makes no difference if we do suppose them to be like that, but rather it in fact furthers our work); for one human, a human who is, and a human are the same thing, and nothing distinct is indicated by the reduplication of wording in "he is one human" and "he is one human who is"[138] (on the contrary, it is clear that they are separated neither in coming to be nor in passing away); and similarly in the case of being one. So it is evident that the addition in these cases indicates the same thing, and that being one is nothing beyond being. Further, the substance of each thing is one in no coincidental way, and likewise is precisely a certain sort of being.}[139] And there are as many forms of being as there are of being one, and to get a theoretical grasp on the what-it-is of each of them belongs to a science that is one in kind—I mean, for example, on same, similar, and other such things). Pretty much all of the

137. Aristotle may be thinking exclusively of human health, since he elsewhere denies that there is one science dealing with the health of animals of different forms (*NE* 1097ᵃ11–13, 1141ᵃ22–23).

138. Reading τὸ εἷς ἄνθρωπος καὶ εἷς ὢν ἄνθρωπος.

139. This material interrupts the flow of argument and should perhaps be omitted.

contraries are referred back to this starting-point. (We must take them to have been theoretically grasped in the *Selection of Contraries*.[140]) **1004ª1**

And there are precisely as many parts of philosophy as there are [kinds] of substances, so that it is necessary for there to be a primary philosophy among them and one that follows this.[141] For being and being one fall from the outset into kinds, which is why the sciences will follow these. For a philosopher is said to be what he is just like a mathematician; for mathematics also has parts, and there is a first and a second science and other successive ones within mathematics.

But it belongs to one science to get a theoretical grasp on opposites, and being many is opposed to being one, and to get a theoretical grasp on the negation and the privation belongs to one science, because in both cases we are getting a theoretical grasp on the one thing of which it is the negation or the privation. For we either say that unconditionally it does not belong or that it does not belong to some kind, and in the latter case, then, the difference is present beyond what is in the negation (for the negation is [just] the thing's absence, and in the case of the privation a certain nature is also involved that is the underlying subject of which it is said), and [to repeat] being many is opposed to being one.[142] So to know the opposites of the things mentioned—other and unlike and unequal, and everything else that is said to *be* either in accord with these or in accord with being many and being one—belongs to the science mentioned.

But contrariety is also one of these; for contrariety is a sort of difference, and difference a sort of distinctness. So, since things are said to be one in many ways, these things will all be said to *be* in many ways. Nonetheless, it belongs to one science to know all of them; for it is not when they are said to *be* in many ways that knowing all of them belongs to distinct sciences, but when they are neither said in accord with one thing nor is there one thing to which their accounts are referred back. But since all things are referred back to what is primary (as, for example, all things that are said to be one are referred back to what is primarily one), this is also what we must say holds of same, other, and contraries generally. So after determining the number of ways in which something is said to be each of them, we must then explain, by reference to what is primary in each predication, the way things are said to be in relation to that; for some things will be said to *be* by possessing it, some by producing it, others in other such ways.

It is evident, then, that it belongs to one science to have an account of these as well as of substance (this was precisely one of the puzzles[143] mentioned in the book of puzzles[144]), and that it belongs to the philosopher to be able to get a theoretical grasp on all of them. For if it does not belong to the philosopher, who will be the **1004ᵇ1**

140. The reference is probably to the lost work *On Contraries* (F152–157).
141. 1026ª18–19.
142. Retaining τῷ δὲ ἑνὶ ἀντίκειται πλῆθος.
143. 995ᵇ18–27, 997ª25–34 (= P5).
144. Retaining ὅπερ ἐν ταῖς ἀπορίαις ἐλέχθη.

investigator of whether Socrates and Socrates seated are the same, or whether one thing has one contrary, or what a contrary is, or in how many ways something is said to be a contrary? And similarly with other questions of this sort. So, since these things are intrinsic affections of being one qua being one, and of being qua being and not qua being numbers or lines or fire, it is clear that it belongs to that science to know both what each of them is and also their [intrinsic] coincidents. And those who investigate these things[145] do not err in this way, since they are not doing philosophy, but because substance is prior and an issue about which they comprehend nothing.

For just as of number qua number there are special affections (for example, oddness, evenness, commensurability, equality, excess, deficiency), and these belong to all numbers either intrinsically or in relation to each other (and similarly there are other special affections of the solid, both immovable and movable, [and of the movable] both weightless and having weight), so too there are certain special affections of being qua being, and it is about these that it belongs to the philosopher to investigate the truth.

A sign of this is that dialecticians and sophists[146] in fact cut the same figure as the philosopher; for sophistic is only apparently wisdom, and dialecticians discuss all [these] things, and being is common to all [these], but clearly they discuss them because they properly belong to philosophy. Sophistic and dialectic, then, are indeed concerned with the same kind as philosophy, but philosophy differs from dialectic in the way its capacity is employed, and from sophistic in the life it deliberately chooses; and dialectic is examinational[147] about the issues philosophy makes known to us, while sophistic appears to do so but does not.

Further, one of the two columns of contraries is a privation, and all of them are referred back to being and not being, and to one and many (as, for example, being at rest belongs to the one, moving to the many). And pretty much everyone agrees that the beings and the substance are composed of contraries;[148] at any rate, they all say that the starting-points are contraries; for some say that they are odd and even, some that they are hot and cold, some that they are limited and unlimited, some that they are love and strife. And all these and any others are manifestly also referred back to the one and many (for let us suppose this referring back has been established), and the starting-points posited by other thinkers also fall entirely under these as their kinds.

1005^{a}1 So it is evident from these considerations too that it belongs to one science to get a theoretical grasp on being qua being. For all things either are or are derived from contraries and the starting-points of contraries are the one and many. And these belong to one science, whether they are said in accord with one thing or are not said in accord with one thing, which is perhaps in fact the truth. Nonetheless, even if

145. I.e., dialecticians and sophists.
146. *SE* $171^{b}25$–34.
147. *Top*. 8.5–11, *SE* $165^{b}4$–6.
148. Cf. $1075^{a}28$–34, $1087^{a}29$–$^{b}4$.

things are said to be one in many ways, the others will be said to be one with reference to the first, and contraries similarly. And because of that[149]—and if being or one is not a universal and the same over all things or separable (as presumably it is not), but some things are said to *be* or to be one with reference to one thing, others in virtue of succession—and because of that [to repeat], it does not belong to the geometer to get a theoretical grasp on what a contrary is, or what completeness is, or what being or being one is, or same or other, except on a hypothetical basis.

It is clear, then, that it does belong to one science to get a theoretical grasp on being qua being and on the affections that it has qua being, and that the same science will get a theoretical grasp not only on substances but also on their affections, both those mentioned as well as prior and posterior, kind and form, whole and part, and others of this sort.

4.3
Axioms and the Principle of Non-contradiction

And it must be stated whether it belongs to one science or to distinct ones to get a theoretical grasp both on what in mathematics are called "axioms" and on substance. It is evident, then, that the investigation of these does also belong to one science and, besides, that the science in question is the philosopher's; for these axioms hold of all the beings, not of some special kind separate from the others. Also, because they are true of being qua being and each kind is a kind of being, all people use them. But they use them only so far as is adequate for their purposes, that is, so far as the kind extends about which they are carrying out their demonstrations.

So, since it is clear that these axioms hold of all things qua beings (for this is what is common to them), their theoretical investigation too belongs to the person who knows being qua being. That is why none of those who investigate a part [of being]—neither geometer nor arithmetician—attempts to say anything about them, as to whether or not they are true. But some natural scientists, as makes perfect sense, did do this; for they were the only ones who thought that they were both investigating nature as a whole and investigating being. But since there is someone further, higher than the natural scientist (for nature is one particular kind of being), it will belong to him whose theoretical grasp is universal and concerned with primary substance[150] also to investigate these axioms. Natural science, however, is also a sort of wisdom, but it is not the primary sort.[151] **$1005^{b}1$**

As for the attempts of some of those who speak about the truth, as to the way in which it should be accepted, they do this because of a lack of educatedness in

149. Reading καὶ διὰ τοῦτο at $1005^{a}8$.
150. $1032^{b}1–2$, $1037^{b}3–4$.
151. 6.1.

analytics; for people should come with prior scientific knowledge of analytics, not look for it while listening [to lectures in the science they are learning].

It is clear, then, that it belongs to the philosopher—that is, to the one who gets a theoretical grasp on the nature of all substance—also to investigate the starting-points of deductions. And it is fitting for the one who knows best about each kind to be able to state the most stable starting-points of his subject matter, and so when this subject matter is the beings qua beings, he must be able to state the most stable starting-points of all things. And this person is the philosopher. But the most stable starting-point of all is that which it is impossible to be deceived about; for such a starting-point must be both the best known (for it is things that people do not know that they can all be fooled about) and unhypothetical. For a starting-point that must be possessed by anyone who is going to apprehend any of the beings is no hypothesis. And what someone must know who knows anything at all, he must already possess. It is clear, then, that such a starting-point is the most stable of all.

What it is, however, we must next state, namely, that the same thing cannot at the same time belong and also not belong to the same thing and in the same respect (and let us assume that we have also added as many other qualifications as might be needed to respond to logico-linguistic difficulties). This, then, is the most stable of all starting-points; for it has the distinguishing feature that was mentioned. For it is impossible for anyone to suppose the same thing to be and not to be, as some people think Heraclitus did.[152] For it is not necessary for what someone says to also be what he supposes. But if it is not possible for contraries at the same time to belong and not belong to the same thing (and let us assume that the usual qualifications have been added to this proposition too), and if what is contrary to a belief is the belief in its contradictory, it is evident that it is impossible for the same person at the same time to suppose the same thing to be and not to be; for a person who has false views on this point would hold contrary beliefs at the same time. That is why all who are carrying out a demonstration lead it back to this as an ultimate belief; for this is by nature the starting-point of all the other axioms too.

4.4
Seven Arguments (A1–7) for the Principle of Non-contradiction

But there are some people, as we said, who themselves assert both that it is possible
1006a1 for the same thing to be and not to be and also to suppose this to be so. Many even of those concerned with nature make use of this claim. But we have just now supposed it to be impossible for anything at the same time to be and not to be, and by means of this we have proved that this is the most stable of all starting-points.

152. Presumably on the basis of B10, B60, B61, B67, B88, B111 DK.

Some people demand that one demonstrate even this, but this is due to lack of educatedness; for it is lack of educatedness not to know what things one should look for a demonstration of and what things one should not; for it is, in general, impossible to demonstrate everything (for it would go on without limit, so that even then there would be no demonstration). But if there are things one should not look for a demonstration of, these people would not be able to say what starting-point they think has more of a claim to be such.

There is, however, a demonstration by refutation that even this view is impossible, if only the disputant says something. But if he says nothing, it is ridiculous to look for an argument against someone who has an argument for nothing, insofar as he has none; for such a person, insofar as he is such, is like a vegetable. And by "demonstrating by refutation" I mean something different from demonstrating, because in demonstrating we might seem to be asking for what was initially at issue,[153] but if the other person is responsible for an assumption of this sort, it would be a refutation, not a demonstration.

The starting-point for all such arguments is to ask the disputant not to state something to be or not to be (for one might suppose this to be assuming what was initially at issue), but rather to signify something both to himself and to another person; for that is necessary if indeed he is to say something. For if he does not grant this, no argument is possible for such a person, either with himself or with another person. But if he does grant it, demonstration will be possible; for there will already be something definite. The one responsible for it, however, is not the one who gives the demonstration but the one who submits to it; for in doing away with argument, he submits to argument. Further, anyone who agrees to this has agreed that something is true without a demonstration, so that not everything will be so-and-so and not so-and-so.

[A1] First, then, this at least is clearly true: the name [agreed to signify something by the disputant] signifies is or is not this, so that not everything will be so-and-so and not so-and-so.

[A2a] Further, if human signifies one thing, let this be two-footed animal. I mean by "signifying one thing" that if human is this, then, insofar as anything is human, this will be the being for human. But even if someone were to say that the name involved signifies more than one thing, it makes no difference, provided that these were definite; for to each account a distinct name could be assigned. I mean, for example, if someone were to say that human signified not one thing but several things, of one of which the account was two-footed animal, although there were also several other accounts, but a definite number of them; for a special name would be assigned to each account. If, however, he did not assign that way, but instead said that human signified an unlimited number of things, it is evident that no argument would be possible [with him]; for not to signify one thing is to signify nothing, and if names

153. *Top*. $162^{b}34$–$163^{a}13$, *SE* 27.

do not signify, discussion with others is done away with, as in truth it is even with ourselves; for it is not possible even to understand without understanding one thing. But if it is possible, one name would be assigned to this thing.

Suppose then, as was said at the start, that the name signifies something, and that it signifies one thing. It is not, then, possible that the being for human should signify what is precisely not being for human, if human signifies not only about one thing but also one thing (for we do not think that this is what it is to signify one thing, to signify about one thing, since that way even the musical and the pale, and the human would signify one thing, so that all would be one; for they would be synonymous).

Also, it will not be possible to be and not to be the same thing except homonymously—as if what we call "human" others were to call "not human." But the puzzling thing is not this, whether it is possible for the same thing at the same time to be and not be human in name, but whether it is possible for it to be so in fact. If, however, human and not human do not signify distinct things, it is clear that neither will the not being for human signify something distinct from the being for human, and so the being for human will be the not being for human; for they will be one thing. For to be one thing signifies this: to be like mantle and cloak, if their account is one. But if they are one thing, the being for human and the being for not human will signify one thing. It has been proved,[154] however, that they signify distinct things. Therefore, if it is true to say of something that it is human, it is necessary for it to be a two-footed animal; for this is what human signified. And if that is necessary, then it is not possible for the same thing not to be at that time two-footed animal (for necessary for it to be signifies this: that it is impossible for it not to be). Therefore, it is not possible at the same time for it to be true to say that the same thing is human and is not human.

[A2b] And the same argument also applies in the case of not being human; for the being for human and the being for not human signify distinct things, if indeed even to be pale and to be human signify distinct things; for the former are much more opposed, and so signify something distinct. But if the disputant says that pale too signifies one and the same thing as human, we will say precisely the same as was said previously, that all—and not only opposites—will be one. But if that is not possible, what was stated follows, if he will answer what he is asked.

But if, when one poses the question unconditionally, he adds the negations too, he is not answering the question asked. For there is nothing to prevent the same thing from being human and pale and a thousand other things. Nonetheless, since the question was whether it is true to say that this thing is human or not, the answer should signify one thing and not add that it is also pale and large. And in fact it is impossible to go through all its coincidents, which are unlimited in number. So he should go through either all or none. In the same way, therefore, even if the same thing is a thousand times human and not human, he should not, in answering the

154. 1006b11–18.

question whether it is human, add that it is at the same time also not human, unless he is to add the other coincidents too, those that it is and those that it is not. But if he does that, he is not engaged in discussion.

[A2c] And, in general, those who say this do away with substance and essence. For it is necessary for them to say that all are coincidents and that there is no such thing as the being precisely for human or the being precisely for animal. For if anything is to be precisely [the] being for human, this will not be [the] being for not human or [the] not being for human (and yet these are its negations); for what was signified was one thing, and this was something's substance. But to signify the substance of something is to signify that the being for it is no other thing. But if for it to be the being precisely for human is either for it to be the being precisely for not human or precisely the not being for human, it will be some other thing, so that it is necessary for them to say that this sort of account applies to nothing, but that all are coincidental; for substance and coincident are distinguished by this: the pale coincides with the human because he is pale but not precisely pale.

But if everything is said coincidentally, there will be no primary thing that they are said of, if a coincident always signifies a predication of some underlying subject. Therefore, it is necessary for predication to go on without limit; but that is impossible; for no more than two things can be combined in predication; for a coincident **1007^{b}1** does not coincide with a coincident, unless it is because both coincide with the same subject. I mean, for example, that the pale is musical and the musical is pale, because both coincide with the human. But it is not the case that Socrates is musical in this way, that both [he and it] coincide with some other thing. Therefore, since some things are said coincidentally in the former way, others in the latter, those said in the way in which the pale coincides with Socrates cannot form an unlimited series in the upward direction (so that, for example, of pale Socrates some other thing is a coincident); for no one thing comes about from all of them. Nor indeed will another thing—for example, the musical—be a coincident of the pale; for it no more coincides with the pale than the pale does with it. At the same time too what coincides in this way has been distinguished from what coincides in the way in which the musical coincides with Socrates. But in cases of the latter sort the coincident does not coincide with a coincident, although in those of the former sort it does, so that not everything will be said coincidentally. Even [when things are said] in this way, then, there will be something signifying substance. And if that is so, it has been proved that contradictories cannot be predicated at the same time.

[A3a] Further, if contradictories are all true of the same thing at the same time, it is clear that all will be one. For the same thing will be a trireme, a wall, and a human, if it is possible either to affirm or deny something of all of them, as those who give the argument of Protagoras[155] must do. For if a human is believed by someone not to be a trireme, clearly he is not a trireme—so he also is a trireme, if indeed the contradictory

155. 1009^{a}6–16, 1053^{a}35–36.

is true. And the view of Anaxagoras[156] also comes about, that all things were together, so that there is nothing that is truly one. It is about the indefinite, then, that they would seem to be speaking, and while they think they are speaking about being, they are really speaking about not being; for it is potential being but not actual being that is indefinite.

But then it is necessary for them, at any rate, to assert of every subject either the affirmation or the negation of everything; for it would be strange if to each thing its negation belonged, while the negation of some other thing, which does not belong to it, did not belong to it. I mean, for example, that if it is true to say of a human that he is not a human, it is clear that he is both a trireme and not a trireme. If, then, the affirmation belongs, the negation does too. But if the affirmation does not belong to him, at least the negation belongs to him more than his own negation does. So if **1008^{a}1** even the latter belongs to him, the negation of trireme will belong to him too; and if it does, the affirmation of it will too.

[A3b] And not only does this follow for those who give this argument, but it also follows that it is not necessary either to affirm or deny. For if it is true that he is a human and not a human, it is clear that he will also be neither a human nor not a human; for of the two there are two negations, but if one is composed of the former two, it will also be opposed by one.

[A4] Further, either this applies to all of them, and a thing is both pale and not pale, both being and not being, and similarly for all other affirmations and negations, or it does not do so, but applies to some and does not apply to others. And if it does not apply to all, these could be agreed on. But if it does apply to all, once again either the negation will belong wherever the affirmation does and the affirmation will belong wherever the negation does, or else the negation will belong wherever the affirmation does but the affirmation will not always belong where the negation does. [A4a] And if the latter is the case, there will be something that is assuredly not being, and this will be a stable belief. And if not being is something stable and known, the opposite affirmation will be better known. [A4b] But if anything denied can also equally well be affirmed, necessarily either it is true to divide and say, for example, that a thing is pale and, in turn, to say that it is not pale, or it is not true. [A4b-i] But if it is not true to divide and say this, he is not really saying these things and nothing whatever has being. (How could things that do not have being walk and talk?) Also, all things will be one, as was also said previously, and the same thing will be human and god and trireme and the negations of these (for if they belong in the same way to each thing, one thing will in no way differ from another; for if it did differ, that would be true and special to it). [A4b-ii] Similarly, even if it is possible to divide and speak truly, what was said still follows, and in addition everyone will speak truly and everyone will speak falsely, and so the disputant will speak falsely by his own admission.

156. B1 DK. Also 1056^{b}28–30, 1069^{b}21.

At the same time it is evident that in response to this person there is nothing for an investigation to be about; for he says nothing. For he says neither that it is so-and-so nor that it is not so-and-so, but that it both is so-and-so and is not so-and-so; and then again he denies both of these, saying that it is neither so-and-so nor not so-and-so; for if he did not, something would already be definite.

[A5] Further, if whenever an affirmation is true, its negation is false, and whenever the negation is true, the affirmation is false, it will not be possible both to affirm and to deny the same thing truly at the same time. (But presumably disputants might say that this was the very point at issue from the start.) **$1008^{b}1$**

[A6] Further, is someone who supposes that something is some way, or that it is not some way, speaking falsely, while someone who supposes that it is both is speaking truly? For if the latter is speaking truly, what can be meant by saying that the nature of the beings is like that? But if he is not speaking truly, but is speaking more truly than someone who supposes in the former way, the beings will already be in some way, and this will be true and not at the same time also not true. And if all speak both falsely and truly to the same degree, there will be nothing for a person in that condition to utter or say; for at the same time he says this and also not this. And if he supposes nothing to be so, but instead thinks and does not think to the same degree, how would his state be any different from a vegetable's?

From this too it is entirely evident that no one—whether other people or those who give this argument—is in fact disposed in this way. For why does someone walk to Megara instead of staying where he is, when he thinks he should walk there?[157] Why does he not early one morning march straight into a well or into a ravine, if one happens to be about, instead of taking evident care to avoid doing so, as if he were someone who is not to the same degree thinking that it is not good to fall in and that it is good? Therefore, it is clear that he supposes one thing to be better and the other not better. And if this is so, he must also suppose one thing to be human and another not human, one thing sweet and another not sweet. For he does not look for and suppose all things to be equally so (for if he thinks it is better to drink water and to see a human, he proceeds to look for these things), and yet he should do so, if the same thing were to the same degree human and not human. But, precisely as was said, there is no one who does not take evident care to avoid some things and not others, so that, as it seems, everyone supposes something to hold unconditionally, if not about all things, about what is better and worse. And if this is not scientific knowledge but belief, they should be all the more concerned about the truth, just as someone who is sick should be more concerned about health than someone who is healthy. And indeed someone who has belief, when compared to someone who has scientific knowledge, is not in a healthy condition in relation to truth.

[A7] Further, even if all things may be so-and-so and not so-and-so, still more and less are, at any rate, present in the nature of the beings; for we would not say that two

157. $1063^{a}28–35$.

and three are to the same degree even, or that someone who thought that four things were five and someone who thought they were a thousand were to the same degree deceived. If, then, they are not these things to the same degree, it is clear that one of them is such to a lesser degree, so that it is more true. If, then, what is more is closer, there must be something true to which the more true is closer. And even if there is not, there is, at any rate, already something more stable and more truth-like, and we will have set ourselves free from the extreme version of the argument that prevents us from having anything definite in our thought.

4.5
Discussion of Protagoras' Argument That Man Is the Measure of All Things

The argument of Protagoras[158] also derives from the same belief, and both alike must be either true or untrue; for if all the things that seem to be so and all the appearances are true, everything must at the same time be true and false (for many people suppose things to be so that are contrary to those supposed to be so by others, and think that people who do not believe what they believe are deceived, so that it is necessary for the same thing to be and also not to be). And if that is the case, the things that seem to be so must all be true (for those who believe falsely and those who believe truly believe opposite things from each other; so if the beings are the relevant way, everyone will believe truly).

It is clear, then, that both arguments derive from the same line of thought. But the same mode of discussion must not be used in response to all the disputants one encounters; for some need persuasion, others force.[159] For the ignorance of those who suppose this to be so because they were puzzled is easily cured (for the reply to them is directed not at the argument but at the line of thought [behind it]). Those, though, who state it for the sake of argument must be cured by refutation both of the account as expressed in their speech and in the names.[160]

Those who are genuinely puzzled come to this belief from perceptibles. They believe that contradictories and contraries belong to things at the same time because they see contraries coming to be from the same thing. So if it is not possible for what is not to come to be, the thing in question must have previously been both alike. And as Anaxagoras says everything is mixed in everything, and Democritus too; for he says that the void and the full belong alike to every part whatever, and yet one of these is being and the other not being. In response to those, then, who suppose what they suppose to be so on this basis, we say that in one way they speak correctly but in

158. 1053a35–36.
159. *Top*. 105a16–19.
160. 1006b7–18.

another way they speak in ignorance; for things are said to *be* in two ways, so that in one way it is possible for something to come to be from not being, while in another way it is not, and for the same thing at the same time to be and not to be, although not in the same way; for it is possible for contraries to belong potentially to the same thing at the same time, but not to do so actually. Further, we will require them to suppose that among the beings there is also another sort of substance to which neither movement nor passing away nor coming to be at all belongs.

Similarly, some have come to believe in the truth of appearances on the basis of perceptibles.[161] For they think that it is inappropriate to judge the truth by the large or small number [of people who believe it], but that the same thing seems sweet to some who taste it, bitter to others, so that if all were sick or bereft of thought, while two or three were healthy or possessed of understanding, it is these who would seem to be sick and bereft of thought and not the others. Further, many of the other animals have appearances contrary to ours concerning the same things, and even for each one of us, relative to himself, the same things do not always seem the same to perception. Which, then, of these appearances is true or false is unclear; for the one lot is no more true than the other, but rather equally so. That is why Democritus, at any rate, says that either there is no truth or that to us at least it is unclear.

In general, however, it is because they suppose perception to be thought, and that it is an alteration, that they say that what appears to perception must of necessity be true; for it is on the basis of these views that both Empedocles and Democritus and (one might almost say) all the others have been captivated by beliefs of this sort. And Empedocles in fact says that people who change their state change their wisdom:

> For cunning increases in men in relation to what is present to their perceptual modalities.

And elsewhere he says that:

> To the extent they change over to become altered, to that extent they always find
> Their thinking too presenting other things.[162]

And Parmenides expresses himself in the same way:

> For as at each moment is the mixture of their much wandering parts,
> So is understanding present in men. For the same thing
> Is just what does the thinking, the nature of his parts,
> In each and every human being. For what predominates is what is understood.[163]

161. 1063^{a}35–^{b}7.
162. B106, B108 DK (*DA* 427^{a}22–25).
163. B16 DK.

A saying of Anaxagoras to some of his companions is also recorded, that things would be for them as they supposed them to be. People say that even Homer manifestly held this belief, because he made Hector, when he was stunned by a blow, lie there "thinking altered thoughts,"[164] as if even those bereft of thought are thinking, but not the same thoughts. So it is clear that if both are states of thinking, the beings will be so-and-so and not so-and-so at the same time. And it is insofar as this is so that the consequences are most difficult; for if those who have seen as much of the truth as is possible for us (and these are the ones who look for it the most and love it the most)—if they hold beliefs of this sort and express these views about the truth, how can one expect beginners in philosophy not to lose heart? For to look for the truth would be a wild-goose chase.

1010a1 What caused these people to hold this belief, however, was that while investigating the truth about the beings, they took the only beings to be the perceptible ones, and in these there is much of the nature of the indefinite—that is, of the sort of being described.[165] That is why, though they speak in a perfectly sensible way, they do not speak truly; for it is more fitting to put the matter like that than as Epicharmus put it against Xenophanes.[166] Further, seeing that all this sort of nature is in movement, and that about what is changing nothing true can be said, they concluded that about what is in every respect and in every way changing, at any rate, it is not possible to grasp the truth. For it was from this supposition that there blossomed the most extreme belief of the ones mentioned, that of the declared Heracliteanizers. This was also the sort held by Cratylus,[167] who in the end thought that he should say nothing, but instead only moved his finger, and criticized Heraclitus for saying that it is not possible to step into the same river twice; for he thought one could not do so even once.

We, however, in response to this argument too will say that while they do have some argument for thinking that what is changing, when it is changing, is not, and yet this, at any rate, is disputable; for what is losing something has some of what is being lost, and of what is coming to be, something must already be.[168] And, in general, if something is passing away, there will be something that it is, and if something is coming to be, there must be something from which it comes to be and something by which it is generated, and this does not go on without limit. But leaving that point aside, we may say this, that it is not the same thing to change in quantity and to change in quality. Granting, then, that a thing's quantity does not remain what it was, still it is by its form that we know each thing.

Further, those who supposed this to be so could fairly be criticized for asserting about the whole of the heaven what they saw only in a minority even of perceptibles; for the region of the perceptible realm around us is the only one that remains in

164. *Iliad* 23.698. See *DA* 404a30.
165. 1009a32–36.
166. Reference unclear.
167. 987a32.
168. *Ph.* 240a19–29.

permanent process of coming to be and passing away. But this is (one might almost say) not even a fraction of the whole, so that it would be more just to acquit this portion because of the other than to condemn the other because of it.

Further, it is clear that we will also say in response to these people what we said before;[169] for it must be proved to them, and they must be persuaded, that there is a certain nature that is immovable. And indeed to say that things at the same time are and are not is to imply that all of them are at rest rather than that they are moving; for there is nothing for things to change into; for everything belongs to everything.

But in the case of truth, [it must be proved] that not everything that appears is **1010^{b}1** true. First, even if perception—at any rate, of a special object[170]—is not false, still imagination is not the same thing as perception. Again, it is fair to wonder if our respondents are really puzzled as to the following: whether magnitudes and colors are such as they appear to people at a distance, or as they appear to those close at hand; or whether they are such as they appear to the healthy or such as they appear to the sick; or whether things are heavier if they appear so to weak people or if they appear so to strong ones; or whether things are true if they appear so to those asleep or to those awake. For that the people involved do not think so, at least, is evident. At any rate, no one who is in Libya and [while asleep] one night supposes himself to be in Athens lots off for the Odeon [when he wakes up]. Further, about the future, as Plato too says,[171] the belief of a doctor and that of an ignorant person are surely not equally in control [of the truth]—for example, about whether someone is going to become healthy or not going to.

Further, among perceptual modalities themselves there is not the same degree of control in the case of the object of a capacity other than itself as in that of its special object, nor in the case of a neighboring object as in that of its own, but in the case of color it is sight that has control, not taste, and where flavor, it is taste that has it, not sight. And each of these never says in the same time frame about the same thing that it is so-and-so and not so-and-so at the same time. Nor even when different time frames are involved was there dispute about the affection, but about the thing with which the affection coincided. I mean, for example, that the same wine might, if either it changed or the body of the perceiver changed, seem at one time sweet and at another time not sweet. However, the sweet, the sort of thing it is when it is present, has in no way changed; rather, the perceptual modality always grasps the truth about it, and whatever is to be sweet is of necessity of this sort. And yet all these arguments do away with this, and just as there is no substance of anything, so nothing is of necessity either; for what is necessary cannot possibly be in one state and another, so that if anything is of necessity, it will not be both so-and-so and not so-and-so.

169. $1009^{a}36–38$.
170. *DA* $418^{a}11–16$. Cf. *Sens*. $447^{a}15–20$, $449^{a}21–24$.
171. *Theaetetus* 171e, 178b–179a.

And, in general, if indeed only the perceptible exists, nothing would exist unless animate beings existed; for there would be no perception. That neither perceptibles nor perceptual affections would exist is presumably true (for they are ways of the perceiver's being affected), but that the underlying subjects that produce perception would not exist even without perception is impossible. For perception is certainly not perception of itself, but there is also some other thing beyond the perception, which is necessarily prior to the perception; for what moves something is prior in nature to what is moved, and even if they are said to *be* with reference to each other, this is no less so.

4.6
Discussion Continued

There are some people who are puzzled, however, both among those who are persuaded by all this and among those who merely give these arguments; for they are inquiring about who will judge the person of sound mind and in general, concerning each thing, judge it correctly. But puzzles of this sort are like being puzzled about whether we are asleep now or awake, and all such puzzles amount to the same thing; for those who pose them demand an argument for everything; for they are looking for a starting-point, and to get hold of it through demonstration, since that they, at any rate, are not persuaded is evident in their actions. But precisely as we said,[172] this is how they are affected; for they are looking for an argument for things for which there is no argument; for the starting-point of demonstration is not a demonstration.

These people, then, might be easily persuaded of this (for it is not difficult to grasp). But those who are looking to find in argument alone the force [that will persuade them] are looking for the impossible; for they demand to state things that are contrary, and at once are stating contrary things.[173]

If, however, not everything is relative to something, but some things also are intrinsically [what they are], not everything that appears will be true; for what appears, appears to someone, so that the person who says that everything that appears is true makes all the beings relative to something. That is why those who are looking to find in argument the force [that will persuade them], and who at the same time also demand to subject themselves to argument, must guard themselves and say that it is not what appears that is true but what appears to the one to whom it appears, when it appears, to the perceptual modality to which it appears, and the way it appears. If they subject themselves to argument, however, but not on these terms, they will quickly find themselves stating contrary things. For it is possible for the same thing to appear to be honey to sight but not to taste and—since we have two eyes—for things not to

172. 1006a5–11.

173. I.e., the things they assert are the contraries of the starting-points of the demonstrations they are demanding.

appear the same to the sight of each, if the two sights are dissimilar. For to those who, due to the causes mentioned previously, say that what appears is true, and that that is why all things are alike false and true (for the same things do not appear the same to everyone), or even always the same to the same person, but often things have contrary appearances at the same time (for touch says there are two things when the fingers are crossed, while sight says there is one)—to these we will say, "but not, at any rate, to the same perceptual modality and in the same part of it and in the same way and in the same time frame," so that this would be true. And presumably that is why those who state these things not because they are puzzled, but for the sake of argument must say that this is not true, but true for this person. As was said previously, then, they must make everything relative to something, that is, to belief and perception, so that nothing either has come to be or will be without someone first having a belief about it. But if something has come to be or will be [without anyone's having a belief about it], it is clear that not everything can be relative to belief.

Further, if a thing is one, it is one relative to one thing or to something definite; and if the same thing is both half and equal, still it is not to the double, at any rate, that the equal is relative. If, then, relative to a believer the same thing is human and the object of belief, it is not the believer who will be human but the object of belief. And if each thing is to be relative to a believer, a believer will be relative to things that are unlimited in form.

About the fact that the most stable belief of all is that opposite affirmations are not true at the same time, what the consequences are for those who say that they are, and why it is that they say this, let this much suffice. But since it is impossible for contradictories to be true of the same thing at the same time, it is evident that contraries cannot belong to the same thing at the same time either; for one of a pair of contraries is a privation no less [than a contrary], or a privation of substance, and a privation is the denial [of something] to some definite kind. So, if it is impossible at the same time to affirm and to deny truly, it is also impossible for contraries to belong at the same time, unless either both belong in a certain way or one in a certain way and the other unconditionally.

4.7
The Principle of Excluded Middle

But then neither is it possible for there to be anything in the middle between contradictories, but it is necessary either to affirm or to deny one thing, whatever it may be, of one thing. This will be clear if we first define what truth is and what falsehood is. For to say of what is that it is not, or of what is not that it is, is false, while to say of what is that it is, or of what is not that it is not, is true. So he who says of anything that it is, or that it is not, will say either what is true or what is false. But it is said that neither what is nor what is not either is not or is.

Further, what is in the middle between the contradictories will be so either in the way in which gray is between black and white or in the way in which what is neither a human nor a horse is between the two. But if it is in the latter way, what is in the middle could not change [into either of the extremes] (for a thing changes from not good to good or from good to not good), but in fact it manifestly always does do this (for there is no change except to opposites or things in the middle). But if it is in the middle [in the former way], in this way too there would be some sort of coming to be that is a change to white but not a change from not white. In fact, though, this is never seen.

Further, every object of thought and every intelligible object is one that thought either affirms or denies—this is clear from the definition—whenever it says what is true or says what is false. Whenever it combines things this way by affirmation or negation, it says what is true; whenever this other way, it says what is false.

Further, there must be a middle beyond all contradictories, if it[174] is not being stated for the sake of argument. And so someone could neither state the truth nor not state the truth, and there will be something between what is and what is not; and so there will also be a sort of change between coming to be and passing away.[175]

Further, in those kinds in which the negation implies the contrary, even in those there will be a middle—for example, in numbers there will be a number that is neither odd nor not odd; but that is impossible, as is clear from the definition.[176]

Further, the process will go on without limit, and the beings will be not half as many again but even more. For it will be possible to deny this in turn as regards its affirmation and its negation, and this will be a [new] thing; for its substance is something else.

Further, when someone, on being asked whether something is white, says that it is not, he has denied nothing other than that it is [white], but that it is not [white] is the negation.

Some people, however, have come to this belief in the way they have to other unacceptable ones: when they are unable to solve fallacious arguments, they give in to the argument and accept that the conclusion is true. But while some say what they say due to this cause, others do so because of looking for an argument for everything. The starting-point in response to all these people, however, is from a definition. But the definition is based on the necessity that they themselves signify something; for the account of which the name [they use] is a signifier will be a definition.

It seems, though, that while Heraclitus' argument, which says that everything is and is not, makes everything true, that of Anaxagoras, that there is something in the middle of contradictories, makes everything false; for when things are mixed, the mixture is neither good nor not good, so that there is nothing true to say.

174. The denial of excluded middle.
175. Which is impossible.
176. $1012^{a}4$–5.

4.8
Nothing Is True and Everything Is True

Given these distinctions, it is evident that the one-sided things that some people say, and say about everything, cannot hold good—some saying that nothing is true (for there is, they say, nothing to prevent everything from being like the commensurability of the diagonal), others that everything is true; for these statements are pretty much the same as that of Heraclitus. For anyone who states that everything is true and that everything is false also makes each of these statements separately, so that if indeed each is impossible, the combination of the two is also impossible. **1012^{b}1**

Further, there are manifest contradictories that cannot be true at the same time—and cannot, then, all be false either—and yet this might seem, from what has been said, to be more possible.

Against all such statements, however, what should be asked for (as was also said[177] in the arguments given above) is not that something be or not be, but that something signify something, so that one must argue dialectically from a definition, that is, by assuming what falsity and truth signify. And if what it is true to affirm is nothing other than what it is false to deny, it is impossible for everything to be false; for of a contradiction one part must be true.

Further, if it is necessary that everything be either affirmed or denied, it is impossible for both to be false; for it is one part of the contradiction that is false. Indeed, the often expressed objection to all such statements clearly follows, that they do away with themselves.[178] For anyone who says that everything is true also makes the contrary of his own statement true, so that his own is not true (for the contrary statement denies that it is true), while anyone who says that everything is false makes his own statement so as well. But if each makes an exception of these cases, the former saying that the contrary of his statement is alone not true, the latter that his own is alone not false, it follows nonetheless that each must assume an unlimited number of statements to be true or false; for the statement that says that the true statement is true is true, and this will go on without limit.

It is evident that neither those who say that all things are at rest nor those who say that all things are moving speak truly. For if all things are at rest, the same things will always be true and the same ones always false, but it is evident that this changes (for the speaker himself at one time was not and will not be again). And if all things are moving, nothing will be true. Therefore, everything will be false. But it has been proved that this is impossible. Further, it is necessary that what is changes; for change is from something to something. But then it is not the case that all things are at rest or moving sometimes, and nothing always; for there is something that always moves the things that are moving, and the primary mover is itself immovable.

177. $1006^{a}18–22$.
178. $1062^{b}7–11$.

BOOK 5 (DELTA)

5.1
Starting-Point

Something is said to be a starting-point if it is: The point in a thing from which one would move first—for example, of a line or of a road there is this starting-point from here, and another from the contrary direction. That from which each thing would best come to be—for example, even in learning one must sometimes begin not from what is primary (that is, the starting-point of the thing), but from the point from which it is easiest to learn. The component from which a thing first comes to be—for example, as of a ship the keel does and of a house the foundation, while of animals some suppose that the heart does,[179] some the brain,[180] and others some other such thing. The non-component from which a thing first comes to be, from which movement and change naturally first begin—for example, a child comes to be from its father and mother, and a fight from abusive language. That in accord with whose deliberate choice what is moved is moved and what is changed is changed—for example, the rulers in cities, dynasties, and kingships are said to be *archai*,[181] as are crafts, especially architectonic ones. Further, that from which a thing can first be known is also said to be a starting-point of the thing—for example, the hypotheses are the starting-points of demonstrations.

Things are also said to be causes in the same number of ways; for all causes are starting-points.[182]

It is common, then, to all starting-points to be the first thing from which something is, or comes to be, or is known; but of these some are components, others external. That is why the nature of a thing is a starting-point, as is the element of a thing, and also thought and deliberate choice, and the substance and the for-the-sake-of-which; for of many things the starting-point both of knowledge and of movement is the good and the noble.[183]

5.2[184]
Cause

Something is said to be a cause if it is: The component from which a thing comes to be—for example, the bronze of a statue or the silver of a bowl, also the kinds of these. The form and paradigm, and this is the account of the essence, and kinds of

179. *GA* 735ᵃ12–26, 740ᵃ17–19.
180. Plato, *Timaeus* 44d.
181. *Archê* also means "ruler."
182. Cf. *GC* 324ᵃ27–28.
183. 1078ᵃ31–32.
184. Cf. *Ph.* 194ᵇ23–195ᵇ21.

this (for example, of the octave, the ratio 2:1 and number in general), and the parts included in the account. Further, that from which the change or rest from change first starts—for example, the person who has deliberated is cause [of the action], the father of his child, and in general, the producer is cause of the thing being produced and the change-maker of the change. Further, the end, and this is the for-the-sake-of-which—for example, of taking walks health is the end. For why does he take walks? "In order that he may be healthy," we say. And in speaking that way we think we have presented the cause. Also, anything, then, that comes to be as an intermediate [means] to the end, when someone else has started the movement—for example, in the case of health, slimming, purging, drugs, or instruments; for all these are for the sake of the end, although they differ from each other in that some are instruments and others works.

These, then, are pretty much all the ways in which things are said to be causes, and because they are said to be such in many ways it follows both that there are many causes of the same thing, and not coincidentally (as, for example, a statue has both the craft of sculpture and the bronze as causes—not with reference to another thing but insofar as it is a statue—although not in the same way, but the one as matter and the other as that from which the movement derives), and that things can be causes of each other (as, for example, exercise [is a cause] of good physical condition and the latter of exercise, although not in the same way, but the one as end and the other as the starting-point of movement). Further, the same thing can be the cause of contraries; for the thing that, when present, is cause of so-and-so, we sometimes hold causally responsible, when absent, for the contrary result—for example, the cause of a shipwreck is the absence of the captain whose presence was a cause of its preservation. Both things, presence and privation, are causes in the way movers are.

All the causes now mentioned fall into four most evident ways [of being causes]. For phonetic elements are causes of syllables, matter of artifacts, fire, earth, and all such things of bodies, the parts of the whole, and the hypotheses of the conclusion, as being causes from which [the things come]. And of these some are causes as underlying subject (for example, the parts), some as the essence (for example, the whole, the mode of composition, and the form). And the seed, the doctor, the deliberator, and in general, the producer are all starting-points from which comes change or rest. The remainder are causes as the end and the good of other things; for what other things are for the sake of tends to be the best for them and their end. Let us assume that it makes no difference whether one says "good" or "apparent good."

These, then, are the causes and this is the number of their forms, but the ways of being causes, though many in number, also come under comparatively few headings. For things are said to be causes in many ways, even within the same form, as being prior or posterior to each other—for example, [as a cause] of health, the doctor and the craftsman; of the octave, the double and number; and in every case, whatever includes any of the particular causes.

Further, there are coincidental causes and their kinds—for example, [as a cause of] a statue, in one way Polyclitus, in another a sculptor, because the sculptor coincides with Polyclitus, and, as examples of what includes the coincidental cause, a human is a cause of the statue, or, in general, an animal, because Polyclitus is human and a human is an animal. And among coincidental causes some are more remote than others, some less remote—for example, if the pale and the musical were said to be causes of the statue, but not Polyclitus or a human only.

Beyond all the things said to be causes either properly or coincidentally, however, some are said to be so potentially, others actively—for example, [as a cause of] the house's being built, a builder, on the one hand, and a builder building, on the other.

Similarly, the things that causes are causes of will also be said to be in the ways mentioned—for example, this statue, a statue, or, in general, a likeness; this bronze, bronze, or, in general, matter; and similarly in the case of coincidental [effects].

Further, both the former [proper] and the latter [coincidental] may be said to be causes in combination—for example, not Polyclitus or sculptor but Polyclitus the sculptor.

But still all of these things are just six in number, each said to be in two ways: either as the particular, as the kind, as the coincidental, or as the kind of the coincidental is, or as these are either as combined or as simply said to be, and all of them either as actualities or potentially. But they differ to the extent that what is actual and what is particular exists, or does not exist, at the same time as the things it causes—for example, this person curing at the same time as this one recovering his health, this builder building with this building being built. But this is not always the case with what are potentially causes; for the house does not pass away at the same time as the builder.

5.3
Element

Something is said to be an element if: It is the primary component from which a thing is composed, and indivisible in form into a distinct form—for example, the elements of a voiced sound are the things from which the voiced sound is composed and the ultimate things into which it is divided, these being no longer divided into voiced sounds distinct in form from them, but rather, if they are divided, their parts are of the same form—for example, a part of water is water (but a part of a syllable is not a syllable). Similarly, those who speak of the elements of bodies mean the ultimate things into which bodies are divided, while they are no longer divided into other things differing in form; and whether the things of this sort are one or more than one, they call these "elements."

In much the same way, things are also said to be the elements of diagrams and, in general, of demonstrations; for the demonstrations that are primary and are components of more than one other demonstration are said to be elements of

demonstrations; and of this sort are the primary deductions consisting of three **1014^{b}1**
terms proceeding through one middle.

By metaphorical transference from this case people also call something an "element" when, being one and small, it is useful for many things. That is why what is small, simple, and indivisible is said to be an element. From which it comes about 5
that most universal things are elements (because each of them, being one and simple, belongs to many things, either to all or to most) and that one and point are thought by some to be starting-points. Since, then, the so-called kinds are universal and indivisible (for there is no account of them), some say that the kinds are elements, 10
and more so than the difference, because the kind is more universal—for where the difference belongs, the kind too follows along with it, but where the kind belongs, the difference does not always do so.

Common to all the cases, however, is that the element of each thing is the primary component in each. 15

5.4[185]
Nature

What is said to be nature (*phusis*) is: In one way, the coming to be of things that grow, as if one were to pronounce the *u* long;[186] in another way, the first component from which a growing thing grows. Further, that from which the first movement that is present in each of the beings that are by nature belongs to it itself insofar as it is itself. Those things are said to grow that get their increase in size through another thing by 20
making contact and growing together or by adhesion, as in the case of embryos. But growing together differs from contact; for in the case of contact it is not necessary that any other thing exist besides the contact, while in the case of things that grow together there is some one thing, the same in both, which makes them grow together instead of [merely] making contact, and makes them one as regards continuity and 25
quantity, although not as regards quality.

Further, that first thing from which any being that is by nature is or comes to be, and which is unshaped and cannot be changed from the capacity that belongs to it, is said to be its nature—for example, bronze is said to be the nature of a statue and of bronze artifacts, wood of wooden ones, and similarly in the case of others; 30
for each thing is made from these, when the primary matter is preserved; for it is in this way that the elements of the beings that are by nature are also said to be their nature, some saying that it is fire, some earth, some air, some water, and others some or all of these.

185. Cf. *Ph*. 2.1.
186. *Phuesthai* ("grow") has a long *u* in most of its forms, whereas *phusis* has a short *u*.

Further, in another way the substance of the beings that are by nature is said to be their nature—as, for example, with those who say that the nature is the primary mode of composition, or as Empedocles says:

> There is no nature at all of any mortal things,
> But rather there is only mixing and separating of things
> Mixed, but "nature" is the name bestowed on them by men.[187]

That is why, as regards the things that are or come to be by nature, although that which they naturally come to be or are is already present, we still do not say that they have their nature if they do not have the form and the shape. What is by nature, then, is what is composed of both of these—for example, animals and their parts. But nature is both the primary matter—and this in two ways, either primary relative to the thing itself or primary in general (for example, in works of bronze the bronze is primary relative to themselves, but perhaps water is primary in general, if all meltable things are water)—and the form and the substance, which is the end of their coming to be.

By metaphorical transference from this case every substance, in general, is said to be nature, because the nature of a thing is a sort of substance.

From what has been said, then, the primary nature, in the strict sense, is the substance of things that have a starting-point of movement within themselves, insofar as they are themselves; for the matter is said to be nature because it is receptive of this, and comings to be and growing because they are movements arising from it. And the starting-point of change for the beings that are by nature is this, since it is in some way a component of them, either potentially or actually.

5.5
Necessary

Something is said to be necessary: If it is that without which, as a contributing cause, living is impossible—for example, breathing and nourishment are necessary for an animal, for it cannot exist without these. Also, if it is anything without which it is not possible for the good to be or come to be, or for the bad to be got rid of or taken away—for example, drinking the medicine is necessary in order not to be sick, as is sailing to Aegina in order to get the money. Further, if it is forced or is force (that is, what impedes and tends to hinder, contrary to impulse or deliberate choice), for what is forced is said to be necessary, which is why it is also painful (as Evenus says, "for every necessary thing has a troublesome nature"[188]) and force is a sort of necessity (as

187. B8 DK.
188. F8 West.

Sophocles says, "but force necessitates that I do this"[189]). And it seems that necessity is something that cannot be persuaded, and correctly so; for it is contrary to the movement that is in accord with deliberate choice and in accord with rational calculation.

Further, when it is not possible for something to be otherwise, we say that it is necessary to be as it is. And it is in accord with this sort of necessity that all the others are in some way said to be necessary; for what is forced is said to be necessary either to do or to suffer, when it is not possible to follow impulse because of what is doing the **1015b1** forcing—implying that necessity is that because of which it is not possible for a thing to be otherwise. And similarly in the case of the contributing causes of living and the good; for when, in the one case, the good, and in the other case, living and being, are not possible without certain things, those things are necessary and that cause is a sort of necessity. Further, demonstration is among the things that are necessary, because it is not possible for something to be otherwise if it has been demonstrated unconditionally. The cause of this is the primary things, if the things from which deduction proceeds cannot be otherwise.

Of some things, then, another thing is the cause of their being necessary, of others nothing is such a cause, rather, because of them other things are necessary. So the necessary in the primary and strict sense is the simple; for it is not possible that this should be in more than one state, or even for it to be both in one state and in another; for it would thereby be in more than one state. Therefore, if there are certain things that are eternal and immovable, there is nothing forced or contrary to nature in them.

5.6
One

Things are said to be one either coincidentally or intrinsically: Coincidentally—for example, "Coriscus and the musical" and "musical Coriscus" (for it is the same thing to say "Coriscus and the musical are one" and "musical Coriscus"), "the musical and the just" and "musical and just Coriscus"; for all these are said to be one coincidentally: the just and the musical, because they coincide with one substance, the musical and Coriscus, because one coincides with the other. Similarly, the musical Coriscus is in a way one with Coriscus, because one of the parts in the account coincides with the other—for example, the musical with Coriscus. And musical Coriscus is in a way one with just Coriscus, because a part of each coincides with one and the same thing. The case is similar if the coincident is said of the kind or of the names of something universal—for example, that a human and a musical human are [one and] the same; for it is either because the musical coincides with the human who is one substance or because each of the two coincides with some particular thing—for

189. *Electra* 256.

example, Coriscus. Except they do not both belong to him in the same way, but human presumably does so as kind and included in the substance, while musical does so as a state or affection of the substance. Things that are said to be one coincidentally, then, are said to be so in this way.

Among things said to be one intrinsically, some are said to be so because they are continuous—for example, a bundle [is one] because of being tied together, and pieces of wood, because of being glued together. And a line, even if bent, is said to be one if it is continuous, as is each part—for example, a leg or an arm. Among these themselves, the continuous by nature are more one than the continuous by craft. A thing is said to be continuous when its movement is intrinsically one and cannot be otherwise, and a movement is one when it is indivisible, and indivisible with respect to time. And things are intrinsically continuous when they are one but not by contact; for if you place pieces of wood so that they make contact with each other, you will not say that these are one piece of wood, or one body, or one whatever else is continuous. Continuous things, in general, are said to be one, then, even if they admit of being bent, but still more so those that do not admit of being bent—for example, the shin or the thigh more than the leg, because it is possible for the movement of the leg not to be one [movement]. Also, a straight line is more one than a bent line. But that which is bent and has an angle we say is both one and not one, because it is possible for its movement to be either not all at once or all at once, while that of a straight line is always all at once, and no part of it having magnitude is at rest while another such part moves, as with a bent line.

Further, a thing is said to be one in another way when its underlying subject is undifferentiated in form, and it is undifferentiated when its form is perceptually indivisible. The relevant underlying subject, however, is either the first or the last relative to the end; for in fact wine is said to be one and water is said to be one, insofar as they are indivisible in form, while juices (for example, oils and wine) and meltable things are all said to be one because the ultimate underlying subject of all of them is the same—for all of these are water or air.

Things are also said to be one whose kind is one, although distinguished by opposite differences. And all these are said to be one because the kind that is the underlying subject of their differences is one (for example, horse, human, and dog are one something, because all are animals), and in much the same way, indeed, as cases in which the matter is one. These are sometimes said to be one in this way, and sometimes it is the higher kind that is said to be the same, if they are the ultimate forms of their kind, the ones higher than these. For example, the isosceles and the equilateral are one and the same figure because both are triangles, although they are not the same sorts of triangle.

Further, things are said to be one when the account that states the essence of one is indivisible from another that indicates the other (for every account is intrinsically

divisible).[190] For in this way too what has increased in size and is diminishing in size is one, because its account is one, as is that of their form in the case of plane figures. And, in general, when the understanding that understands the essence of certain things is indivisible, and cannot separate them in time or place or account, these things are most of all one, and of these, those that are substances are most of all one; for those things that do not admit of division, insofar as they do not admit of it, are universally said to be one—for example, if insofar as something is a human it does not admit of division, it is one human, if insofar as it is an animal, one animal, if insofar as it is a magnitude, one magnitude.

Most things are said to be one because of acting on, having, being acted on, or being related to some other thing that is one, while the things that are said to be one in the primary way are those of which the substance is one—and one either in continuity or in form or in account; for in fact we count as more than one either things that are not continuous, or those whose form is not one, or those whose account is not one.

Further, while in a way we say that anything is one if it is a quantity and continuous, in another way we do not say so if it is not some sort of whole, that is, if the form it possesses is not one. For example, if we saw the parts of a shoe randomly put together, we would not say that it was one in a similar way (unless we did so because of its continuity), but only if they were put together in such a way as to be a shoe, that is, so as to already possess some form that is one. That is why of all lines the circle is to the highest degree one, because it is whole and complete.

To be one, however, is to be[191] a sort of starting-point of number;[192] for the first measure is a starting-point; for that by which we first know it is the first measure of each kind. The starting-point, then, of what is knowable about each kind is what is one. But what is one is not the same thing in all kinds. For here it is a quarter-tone, there a vowel or consonant, another thing in the case of weight, and something else in that of movement. In every case, however, what is one is indivisible either in quantity or in form. What is indivisible in quantity, when it is indivisible in all dimensions and lacks position, is said to be a unit, and when it is indivisible in all dimensions and has position, a point. What is divisible in quantity in one dimension is a line, in two a plane, in all—that is, in three—a body. And, reversing the order, what is divisible in two dimensions is a plane, in one dimension a line, and what is in no dimension divisible in quantity is a point or unit; what lacks position is a unit and what has position a point.

190. An account A_1 that states the essence of something indicates it. For A_1 to be divisible from an account A_2 that indicates the same thing, A_1 and A_2 would have to separate that thing from itself in time, place, or account (1016^b1–3). But this is impossible. So A_1 and A_2 must be (or be variants of) the same account (1052^a29–34).

191. Rejecting the addition of τοῦ.

192. 1052^b15–1053^b8.

Further, some things are one in number, others in form, others in kind, others by analogy: in number, those whose matter is one; in form, those whose account is one; in kind, those whose figure of predication[193] is the same; by analogy, those related as another thing is to another thing. And the latter sorts always follow along with the earlier ones—for example, those that are one in number are also one in form, while those that are one in form are not all one in number; but those that are one in form are also one in kind, while those that are one in kind are not all one in form, but are all one by analogy; but those that are one by analogy are not all one in kind.

Also, it is evident that things will be said to be many in ways opposite to those in which they are said to be one; for some things will be many because they are not continuous, others because their matter, whether primary or ultimate, is divisible in form, others because the accounts that state their essences are more than one.

5.7
Be

Something is said to *be*, on the one hand, coincidentally and, on the other, intrinsically: Coincidentally—for example, we say that the just person *is* musical, that the human *is* musical, and that the musical *is* human, and this is much the same as saying that the musical builds, because the builder happens to be musical or the musical happens to be a builder (for here "this is this" signifies this coincides with this). And so it is in the cases mentioned; for when we say that the human is musical and the musical is human, or that the pale is musical or the musical is pale, in the last two it is because both affections coincide with the same thing, and in the first[194] because the affection coincides with the thing that is a being, while the musical is human because the musical coincides with a human (it is in this way too that the not-pale is said to *be*, because what it coincides with is a being). Things that are said to *be* coincidentally, then, are said to *be* in this way, either because both belong to the same thing that is a being, because that to which one belongs is a being, or because the thing itself, to which belongs that thing of which it itself is predicated, is a being.[195]

The things said to *be* intrinsically are the very ones signified by the figures of predication;[196] for the ways in which things are said [to *be*] are the ways in which being signifies. So since of things predicated of a thing some signify what-it-is, some a quality, some a quantity, some a relative, some an acting on or a being acted on, some a where, some a when, being signifies the same thing as each of these; for there is no difference between a human *is* keeping healthy and a human keeps healthy, nor

193. I.e., those in the same category.
194. I.e., the human is musical.
195. The thing itself is the human; that of which it is itself predicated is the musical, which in fact belongs to (or is an affection of) the human, which is a being.
196. I.e., the categories.

between a human *is* walking or cutting and a human walks or cuts, and similarly in the other cases.

Further, being (*to einai*) or is (*to estin*) signify that something is true, and is not signifies that it is not true, but rather a falsehood—similarly, in the case of affirmation and negation. For example, it *is* the case that Socrates is musical signifies that this is true, it *is* the case that Socrates is not pale, that this is true; while it *is not* the case that the diagonal is commensurable signifies that this is false.

Further, is (*to einai*) and being (*to on*) signify the things mentioned, on the one hand, potentially and, on the other, actually. For we say both of what potentially sees **1017**^{b}**1** and of what actually sees that it *is* a seeing thing, and, in the same way, both of what is capable of using its scientific knowledge and of what is using it that *is* a scientifically knowing one, and both of what rest already belongs to and of what is potentially resting that it *is* a resting thing. It is the same way in the case of substances; for in fact we say of Hermes that he *is* in the stone, and of the half-line that it *is* [in the line], and of what is not yet ripe that it *is* wheat. But when something is potential and when it is not yet potential must be determined elsewhere.[197]

5.8[198]
Substance

Said to be substances are: The simple bodies (for example, earth, fire, water, and everything of this sort), bodies in general, the things composed of them, both animals and daimonic beings, and the parts of these. Each of these is said to be a substance because it is not said of an underlying subject, but rather the other things are said of it. And in another way, any component that is the cause of being in such things as are not said of an underlying subject—for example, the soul in the case of an animal. Further, those component parts of such things that define them and signify a this something and whose destruction destroys the whole—as, for example, the plane's does to the body, as some people say,[199] and the line's does to the plane; and in general, number seems to be a thing of this sort to some people (for they think that nothing is if number is done away with, and it defines all things). Further, the essence, the account of which is a definition, is said to be each thing's substance.

It follows, then, that something is said to be substance in two ways; either it is the ultimate underlying subject that is no longer said of anything else or that which, being a this something, is also separable—and the shape and form of each thing is like this.

197. 9.7.
198. Cf. *Cat*. 5.
199. The Pythagoreans and Plato.

5.9
Same

Some things are said to be the same coincidentally—for example, the pale and the musical are the same because they coincide with the same thing, and human and musical are the same because one of them coincides with the other, and the musical is human because it coincides with the human. And the musical human is the same as each of the other two and each of them as it; for both the human and the musical are in fact said to be the same as the musical human, and he the same as they. That is also why all these are not said universally; for it is not true to say that every man is the same as the musical; for the universals belong intrinsically, while the coincidents do not belong intrinsically.[200] But in the case of particulars they are said of them unconditionally; for Socrates and musical Socrates seem to be the same. But Socrates is not said of more than one thing, which is why we do not say "every Socrates" as we say "every human."

Some things, then, are said to be the same in this way. Others are said to be the same intrinsically, and in as many ways as things are said to be one; for in fact things whose matter is one, either in form or in number, are said to be the same, as are things whose form is one, so that it is evident that sameness is a sort of oneness of the being either of more than one thing or of one thing when it is treated as more than one—for example, when one says that a thing is the same as itself, which is to treat it as two things.

Things are said to be distinct [or other] when either their forms, their matter, or the account of their substance are more than one. And, in general, things are said to be distinct in ways opposite to those in which they are said to be the same.

Those things are said to be different which are distinct, though they are the same something—not only in number but either in form, in kind, or by analogy. Further, those that are distinct in kind; and contraries; and those that have distinctness in their substance.

Things are said to be similar[201] whose affections are the same in every respect, and those more of whose affections are the same than other, and those whose quality is one. Also, what shares with something else a majority of those contraries with respect to which alteration[202] is possible, or those with more control,[203] is similar to that thing.

Things are dissimilar in ways opposite to those in which they are similar.

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200. If every human were musical, musical would belong universally to humans, and thus would belong intrinsically rather than coincidentally to them, so that no human would be coincidentally musical.

201. $1054^{b}3$–13.

202. *Ph*. $245^{b}3$–5, *GC* $319^{b}10$–12.

203. Over our perception of similarity.

5.10[204]
Opposites

Things said to be opposites include contradictories, contraries, relatives, privation and having, and the extremes that comings to be and passings away are from and to. And all things that cannot be present at the same time in what is receptive of both are said to be opposed—either themselves or their components. For gray and white do not belong at the same time to the same thing, because their components are opposed.

Said to be contraries are: Those things differing in kind that cannot belong to the same thing at the same time.[205] The most different of the things in the same kind.[206] The most different of the things in the same recipient.[207] The most different of the things falling under the same capacity. The things whose difference is greatest either unconditionally, in kind, or in form. Other things are said to be contraries, either because of having ones of the same sorts as these, because of being receptive of them, being productive of them, capable of being affected by them, because of in fact producing or being affected by them, or because of being losses or acquisitions, or havings or privations, of them.

But since things are said to be one and said to *be* in many ways, the others that are said to *be* in accord with these must also follow along with them, so that same, other, and contrary must be distinct in each category.

Things said to be distinct [or other] in form[208] are those that are of the same kind but not subordinate to each other, any things that, being in the same kind, have some **1018b1** difference, and any things that have contrariety in their substance. Also, contraries are distinct in form, either all of them or those said to be such in the primary way. Also, those things whose accounts are distinct in the ultimate forms of their kind—for example, human and horse are indivisible in kind, while their accounts are other [in this way]; also, any things that, being in the same substance, have a difference.[209]

5.11[210]
Prior and Posterior

Among things said to be prior and posterior, some are so said on the supposition that there is a first and a starting-point in each kind, because they are closer to a certain starting-point defined either unconditionally and by nature, or with reference

204. Cf. *Cat*. 10.
205. *Cat*. 14a22–23.
206. 1055b13–17.
207. *Somn*. 453b27–31.
208. 10.8–9.
209. 1058a6–8.
210. Cf. *Cat*. 12.

to something or somewhere or by certain people. For example, things are prior in place by being closer to some place defined either by nature (for example, the middle or the last place) or with reference to something random; and what is further away is posterior. Others things are prior in time, some by being further from now, as in the case of things that have come to be (for the Trojan wars are prior to the Persian because they are further from now), some by being closer to now, as in the case of things that are to come (for the Nemean Games are prior to the Pythian because they are closer to now, treating now as starting-point and first). Others are prior in movement (for what is closer to the first mover is prior—for example, the boy is prior to the man; and the first mover too is unconditionally a sort of starting-point). Others are prior in capacity (for what is superior in capacity, that is, what is more capable, is prior). Of this sort is, in deliberate choice, the thing that it is necessary for another thing—the posterior one—to follow, so that if the former does not move it, the latter is not moved, and if the former moves it, the latter is moved, and the deliberate choice is a starting-point. Others are prior in order, when there is some one definite thing relative to which things are arranged at intervals in accord with some account—for example, in a chorus the second person is prior to the third, and in the lyre the next-to-bottom string to the bottom one; for in the one case, the chorus leader and, in the other case, the middle string is the starting-point. These things, then, are said to be prior in this way.

But in another way what is prior in knowledge is treated as also unconditionally prior. Among these things, the prior in account are distinct from the prior in perception. For universals are prior in account, while particulars are prior in perception. Also, in account the coincident is prior to the whole—for example, the musical is prior to the musical human; for without the part the account will not be whole. And yet it is not possible to be musical without being a musical something.

Further, the affections of what is prior are said to be prior—for example, straightness to smoothness. For the first is an intrinsic affection of line, and the second of surface. Some things, then, are said to be prior and posterior in this way.

Others, however, are said to be so in nature and substance, when it is possible for them to be without other things, but not the others without them—a distinction used by Plato.[211] But since there are many ways of being, first, the underlying subject is prior, which is why the substance is prior. Second, the potential cases are distinct from the actual ones; for some things are potentially prior, others actually so—for example, potentially, the half-line is prior to the whole, and the part to the whole, and the matter to the substance, while actually, they are posterior; for it is [only] when the whole has been dissolved that the part will actually be.

In a way, then, all the things that are said to be prior and posterior are said to be such with reference to these; for it is possible for some things to be without others

211. Reference unclear.

with respect to coming to be—for example, the whole can be without the parts [with respect to the coming to be of the whole]; while for others it is possible with respect to passing away—for example, the part can be without the whole [with respect to the passing away of the whole]. It is the same way in the other cases too.

5.12[212]
Capacity, Potentiality, Power

Something is said to be a capacity, [potentiality, or power] when it is a starting-point of movement or change either in another thing or in a thing insofar as it is other—for example, the craft of building is a capacity that is not a component of the thing being built, while the craft of making healthy, which is a capacity, might be a component of the thing being made healthy, but not of it insofar as it is being made healthy.[213] The starting-point of change or movement is said to be a capacity in this way, then, when the change or movement is in another thing or in a thing insofar as it is other, but also when it is caused by another thing or by a thing insofar as it is other. For it is in virtue of the starting-point, in virtue of which the thing that is affected is affected, that we say it has the capacity to be affected, sometimes when it is affected in any way at all, sometimes not in virtue of every affection, but when it is for the better.

Further, there is the capacity to accomplish the thing in question well or in accord with deliberate choice; for of those who merely walk or speak, but not well or not as they deliberately choose, we sometimes say that they are not capable of speaking or walking. It is the same way in the case of being affected.

Further, the states in virtue of which something is wholly unaffectable or unchangeable or not easily moved for the worse are said to be capacities; for things get broken, crushed, bent, and in general, pass away not by being capable but by being not capable and deficient in something. And they are unaffectable in these ways if they are scarcely or slightly affected because of a capacity they have and by being capable and being in some state.

Since things are said to be capacities in these many ways, so too what is said to be capable is in one way what has a starting-point of movement or change (for even what can bring things to rest is capable in a way) in another thing, or in a thing insofar as it is other. And in another way if something else has a capacity of this sort with regard to it. And in another way if it has the capacity to change into something, **1019^{b}1** whether for the worse or the better (for even what passes away seems to be capable of passing away, since it would not have passed away if it were incapable of it; but, as things stand, it has a certain disposition, cause, or starting-point to be affected in this way). Sometimes, indeed, it seems that way by having something, sometimes by

212. Cf. 9.1.
213. *Ph.* 192^{b}21–27.

privation of something. But if a privation is in a way a having, everything would be something by having, so that things would be capable both from having a certain sort of state and starting-point and by having the privation of having it, if it is possible to have a privation—or, if this is not possible, things will be capable homonymously.[214] And in another way, if neither another thing nor the thing itself insofar as it is other has a capacity or a starting-point that is destructive of it. Further, all of these are said to be capable of something either merely because the thing might happen to come about or not to come about, or because it might do so well. For the latter sort of capacity is found even in inanimate things, such as instruments; for it is said that one lyre can speak, while another cannot do so at all, if it does not have a good tone.

Incapacity is privation of capacity, that is, privation of the sort of starting-point that has been described, either in general or by what naturally should have it, or even by what at the time should naturally already have it; for a boy, a man, and a eunuch would not in the same way be said to be incapable of begetting children. Further, to each of the two sorts of capacity there is an opposite incapacity—both to what can merely produce movement and to what can produce movement well.

Some things, then,[215] are also said to be incapable in virtue of this sort of incapacity, while others are in another way both capable and incapable, namely, [possible and impossible],[216] where an impossible thing is that of which the contrary is of necessity true. For example, it is impossible for the diagonal to be commensurable, because something like that is a falsehood whose contrary is not only true but also necessarily true; and it is necessary for the diagonal to be incommensurable.[217] Therefore, that it is commensurable is not only false but of necessity false. The contrary of this, the possible, is found whenever it is not necessary that the contrary is false—for example, that a human be sitting down is possible; for that he is not sitting down is not of necessity false. In one way, then, possible, as was said, signifies what is not of necessity false, in another what is true, and in another what admits of being true.

What in geometry is said to be a power is so by metaphorical transference.[218]

These things are capable [or are possible or are a power], then, not in virtue of a capacity. Those that are said to be capable in virtue of a capacity are all said to be such with reference to the primary one, that is, the starting-point of change in another
1020ᵃ1 thing or in a thing insofar as it is other. For the others are said to be capable because something else has a capacity of the relevant sort with regard to them, some because it does not have it, some because it has it in a particular way. It is the same way with things that are incapable. So that the strict definition of the primary sort of capacity

214. Reading εἰ δὲ μή, ὁμωνύμως here.
215. Reading δὴ . . . οἷον.
216. *Dunaton* means both "capable" and "possible"; *adunaton*, both "incapable" and "impossible."
217. Reading ἀλλὰ καὶ ἀνάγκη ἀληθὲς εἶναι· τὴν δὲ διάμετρον ἀνάγκη ἀσύμμετρον εἶναι.
218. As when we say that 9 is 3 to the power of 2 (3^2).

will be what is a starting-point of change in another thing or in a thing insofar as it is other.

5.13[219]
Quantity

Something is said to be a quantity when it is divisible into components each of which is naturally a one and a this something. A quantity is a plurality if it is countable, a magnitude if it is measurable. Something is said to be a plurality when it is potentially divisible into non-continuous parts, a magnitude when potentially divisible into continuous ones. Among magnitudes, those continuous in one dimension are lengths, in two, breadths, in three, depths. Among these, limited plurality is a number, limited length a line, limited breadth a surface, limited depth a body.

Further, some things are said to be quantities intrinsically, others coincidentally—for example, a line is intrinsically a certain quantity, while the musical is coincidentally a quantity.[220] Among those that are intrinsically quantities, some are so in virtue of their substance—for example, a line is a certain quantity in this way (for a certain quantity belongs to the account that says what-it-is). Others are affections and states of such substances—for example, the much and the little, long and short, broad and narrow, deep and shallow, and others of this sort. Both the great and the small and greater and smaller, either when said to be such intrinsically or in relation to each other, are intrinsic affections of quantity. However, these names are also transferred to other things.

Among things said to be quantities coincidentally, some are said to be such in the way in which it was said that the musical and the pale are quantities: in virtue of there being a certain quantity to which they belong, others in the way in which a movement and a time are; for these too are said to be certain quantities and continuous, because of the divisibility of the things of which they are affections. I mean not the thing being moved but the magnitude of its movement; for because of that's being a quantity the change too is a quantity, and the time because of it's being one.

5.14[221]
Quality

What is said in one way to be a quality is a difference in a substance. For example, human is animal qualified in a certain way because it is two-footed, horse because it is four-footed. Also, circle is shape qualified in a certain way because it is without

219. Cf. *Cat.* 6.
220. Because it can coincide with something that is of a certain quantity.
221. Cf. *Cat*. 8.

angles, because a difference with regard to substance is a quality. This, then, is one
1020b1 way in which something is said to be a quality: a difference in a substance. But there is another way, exemplified by the immovable objects and the objects of mathematics, as in the case of the numbers being of a certain quality—for example, composite ones, which are not in one dimension only, but of which the plane and the solid are imitations (these are the ones that have two or three factors). And, in general, any constituent [of a number] beyond quantity that is in its substance is a quality; for the substance of each is what it is once—for example, that of six is not what it is twice or three times but what it is once; for six is one times six.

Further, qualities include all the affections of moving substances, in virtue of which, when they change, bodies are said to alter—for example, hotness and coldness, paleness and darkness, heaviness and lightness, and the others of this sort.

Further, something is said to be a quality with reference to virtue and vice and, in general, to bad and good.

Something is said to be a quality, then, in pretty much two ways, one of which is the strictest way; for quality in the primary sense is the difference in the substance. And of this the quality in numbers is a part; for it is a sort of difference in substances, but either not of moving things or not of them insofar as they are moving. Second, there are the affections of things that move, insofar as they move, and the differences in the movements. Virtue and vice are a part of these affections; for they indicate the difference in the movement or the activity, in accord with which the things in movement act or are acted on either nobly or basely; for what can be moved or can be active in one way is good, and what can be so in another way—the contrary way—is depraved. Good and bad signify quality most of all in the case of animate things, and among these above all in the case of those that have deliberate choice.

5.15[222]
Relative

Things are said to be relative: As double relative to half and triple relative to one third, and in general, multiple relative to submultiple, and what exceeds relative to what is exceeded. As what is capable of heating relative to what is capable of being heated, what is capable of cutting relative to what is capable of being cut, and in general, what is capable of acting relative to what is capable of being acted on. As the measurable relative to the measure, the scientifically knowable to scientific knowledge, and the perceptible to perception.

The first lot are said to be relative numerically, whether unconditionally or in a definite way, and relative to themselves or to one. For example, the double is a definite number relative to one, while the multiple is in a numerical, but not a definite,

222. Cf. *Cat*. 7.

relation to one—for example, not in this or that relation to it. The relation of one-and-a-half to its reciprocal is a definite numerical relation to a number, while one-and-a-bit is related to its reciprocal by an indefinite relation, just as the multiple in relation to one. But the relation of the exceeder to the exceeded is wholly indefinite numerically; for number is always commensurable and what is non-commensurable is not said to be a number, while the exceeder is, relative to the exceeded, so-and-so much plus something more, and this is indefinite; for it can, at random, be either equal or not equal to the exceeded.

All these things, then, are said to be relative with reference to number and are affections of number. As, in a further way, are the equal, the similar, and the same (for they are all said of things with reference to one; for things are the same when their substance is one, similar, when their quality is one, and equal, when their quantity is one; and one is the starting-point and measure of number, so that all these are said of things with reference to number, although not in the same way).

Things that can act or be acted on are said to be relative with reference to a capacity to act or be acted on and the activations of the capacities. For example, what is capable of heating is relative to what is capable of being heated, because it can heat it, and in turn what is heating is relative to what is being heated, and what is cutting to what is being cut, as actively doing the things. Of numerical relations, though, there are no activations, except in the way that has been stated elsewhere,[223] but activations [that are said to be such] with reference to movement do not belong to them.

Among things that are said to be relative with reference to a capacity, some are already said be so with reference to time—for example, what has made is relative to what has been made, and what will make to what will be made. For it is in this way that a father is said to be the father of his son; for the first has acted and the second has been acted on in a certain way. Further some things are said to be relative with reference to the privation of a capacity, such as the incapable and anything else said to be [what it is] in that way—for example, the invisible.

Things that are said to be relative with reference to a number or a capacity, then, are all relative because of being said to be precisely what they are of another thing, not because of the other thing's being relative to them.

But what is measurable or scientifically knowable or thinkable is said to be relative because of another thing's being said to be [what it is] relative to them. For the thinkable signifies that there can be a thought of it, but the thought is not relative to what it is a thought of, (for then the same thing would have been said twice).[224] Similarly, sight is the sight of something, not of what it is the sight of (and yet it is of course

223. $1051^{a}29$–33, $1087^{a}10$–25.

224. A thought T is defined by its object O, so that T is by definition "the T of O." If O did not have an independent definition, it would have to be defined as "the O that T is the T of." Then T would be defined as "*the T of* the O that T is *the T of*," so that the same thing would be said twice.

1021b1 true to say this). Instead, it is relative to color or some thing of this sort. But the other way the same thing will be said twice: sight is of what sight is of.

Things that are said to be intrinsically relatives are said to be such sometimes in these ways, sometimes if their kinds are of the relevant sort—for example, medicine is included among the relatives because its kind, scientific knowledge, seems to be a relative.[225] Further, those things are said to relatives with reference to which their possessors are said to be relatives—for example, equality is a relative because the equal is, and similarity because the similar is. Other things are said to be relatives coincidentally—for example, human is a relative because double coincides with it, and double is a relative, or the pale is, if double and pale coincide in the same thing.

5.16
Complete

What is said to be complete is, in one way, that outside of which not even one part is to be found—for example, the complete time of each thing is that outside of which there is no time to be found that is part of that time. Also, that which, relative to its kind, cannot be surpassed in respect of virtue or goodness—for example, a doctor is complete and a pipe player is complete when they lack nothing as regards the form of their own proper virtue. (It is in this way, transferring the term to bad things, we speak of a complete scandalmonger and a complete thief, since we even say that they are good, for example, a good thief and a good scandalmonger.) Also, virtue is a sort of completion; for each thing is complete and every substance is complete when, as regards the form of its proper virtue, it lacks no part of its natural magnitude.

Further, things that have attained their end, this being something excellent, are said to be complete; for things are complete in virtue of having attained their end. So, since the end is a last thing, we transfer the term to base things and say that a thing has been completely ruined and completely destroyed, when there is no deficiency in its destruction and badness but it has reached its last [point]. That is why death too is by transference said to be an end—because both are last things. And the end—that is, the for-the-sake-of-which—is a last thing.

This, then, is the number of ways in which things said to be intrinsically complete are said to be such, some because with respect to goodness they are deficient in nothing and can neither be exceeded nor can anything of theirs be found outside them, others because, in general, they cannot be exceeded in their several kinds and have nothing of theirs outside them. The rest are said to be complete with reference
1022a1 to these, because they either produce or possess something of the relevant sort, or are fitted for it, or in some way or other are said to be complete with reference to the things that are said to be such in the primary way.

225. *Cat*. 11a24–32; also *Top*. 124b18–19.

5.17
Limit

What is said to be a limit is: The last point of each thing, that is, the first outside which it is not possible to find any part, or the first inside which every part is found. The form,[226] whatever it may be, of a spatial magnitude or of what has spatial magnitude. The end of each thing (that toward which there is movement or action, not that from which—although sometimes it is both, that from which and that toward which[227]) and the for-the-sake-of-which. The substance of each thing and the essence of each; for this is the limit of knowledge, and if of knowledge, of its object too. So it is evident that things are said to be a limit in as many ways as they are said to be a starting-point, and yet more; for a starting-point is a sort of limit, but not every limit is a starting-point.

5.18
In Virtue of Which

Something is said to be that in virtue of which (*kath' ho*)[228] in many ways. The form and the substance of each thing—for example, that in virtue of which a man is good is good itself. The primary thing in which something naturally comes to be—for example, color in a surface. The primary way, then, in which something is said to be that in virtue of which is by being the form, and in a secondary way by being the matter of each thing and the first underlying subject of each.

In general, that in virtue of which belongs to things in the same number of ways as the cause does; for "in virtue of what has he come?" is said, or "for the sake of what has he come?" or "in virtue of what has he deduced, or wrongly deduced?" or "what is the cause of his deducing, or wrongly deducing?"

Further, something is said to be that in virtue of which with reference to position—for example, that with reference to whose position he stands based, or walks; for all these signify position or place.[229]

And so intrinsically [or in virtue of itself] must also be said of things in many ways. For in one way, the essence of each thing is what it is intrinsically—for example, Callias is intrinsically Callias, as is the essence of Callias. In another way, anything that is present in the what-it-is—for example, Callias is intrinsically an animal; for animal is present in his account; for Callias is a sort of animal.

226. Here the shape or spatial arrangement rather than the form that is identical to the essence.
227. E.g., *NE* $1143^{b}10–11$.
228. No single English expression captures all its senses.
229. Reading πάντα γὰρ ταῦτα.

Further, if it, or one of its parts, is the primary recipient—for example, a surface is intrinsically white, and a human is intrinsically alive; for the soul, which is a part of a human, is the primary recipient of life.

Further, what has no other cause; for a human has many causes, animal, two-footed, nonetheless a human is intrinsically a human.

Further those affections are intrinsic to a subject that belong to it alone, and insofar as they belong to it merely because of itself, considered as what is separate by itself.[230]

5.19
Disposition

1022b1 What is said to be a disposition is the arrangement of what has parts with respect either to place, capacity, or form; for it must be some sort of position, as the name "dis*position*" also indicates.

5.20[231]
Having (or State)

What is said to be a having [or state] (*hexis*) in one way is a sort of activation of the haver and what he has, like a sort of action or movement; for when one thing makes and another is made, there is a making between them. In the same way too between the person who has clothes and the clothes he has there is a having. This sort of having, then, it is evident that one cannot have (for it would go on without limit if it were possible to have the having of what one has). What is said to be a having [or state] in another way is a disposition in virtue of which what is disposed is either well- or ill-disposed, and either intrinsically or with reference to something else—for example, health is a state; for it is a disposition of this sort. Further, anything that is a part of such a disposition is said to be a state—which is why the virtue of [a thing's] parts is also a state.

5.21
Affection

What is said to be an affection in one way is a quality in virtue of which a thing can be altered—for example, white and black, sweet and bitter, heaviness and lightness, and other things of this sort, in another way, the activations of these, the already accomplished alterations. Further, of these, especially alterations and movements that

230. Reading δι' αὐτὸ κεχωρισμένον καθ' αὑτό.
231. Cf. *Cat*. 15.

are injurious—above all, painful injuries. Further, large-scale misfortunes and painful experiences are said to be affections.

5.22
Privation (Lack)

Something is said to lack something in one way if it does not have one of the affections that something or other naturally has, even if this thing itself does not naturally have it—for example, a plant is said to lack eyes. In another way if what it or its kind naturally has, it itself does not have—for example, a human being who is blind and a mole lack sight in different ways, the former in contrast to its kind, the latter intrinsically. Further, if it does not have what it is natural for it to have when it is natural for it to have it; for blindness is a sort of privation, but a being is not blind at any and every age, but only if it does not have sight when it is natural for it to have it. Similarly, if it does not have sight in that in which, and in virtue of which, and in relation to which, and in the way in which, is natural.[232] Further, a thing forcefully taken away is said to be lacked.

Also, things are said to be privations (lacks) in as many ways as there are ways of saying things with a negative affix; for something is said to be *un*-equal because it does not have the equality it is natural for it to have, and *in*-visible either because it has no color at all or because it has minimal color, and foot-*less* either because it has no feet or minimal feet. Further, a thing is said to lack something if it has little of it—for example, pitless fruit. This is a case of having it minimally. Further, if it does not have it easily or well—for example, we say that something is uncuttable not only if it cannot be cut but if it cannot be cut easily or well. Further, if it does not have it at all; for a man who has no sight in one eye is not said to be blind, but rather the man who has no sight in either eye. That is why not everyone is good or bad, just or unjust, but there is also an intermediate state.

5.23[233]
Have (Hold)

Something is said to have [or hold] in many ways. One way is to treat it in accord with the possessor's own nature or in accord with its own impulse. That is why a fever is said to have hold of a human being and tyrants to have hold of their cities, and people to have the clothes they wear. In another way, what a thing is present in, as in something receptive of it, is said to have it—for example, the bronze has the form of the statue, and the body has the disease. In another way, what encompasses something is said

232. Respectively, the medium (normal light, not darkness), the organ (eyes, not ears), the object (color, not sound), e.g., the direction (in front, not behind).
233. Cf. *Cat*. 15.

to hold what it encompasses; for what is in what encompasses it is said to be held by it—for example, that the vessel holds liquid, and the city human beings, and the ship sailors. And it is this way that the whole has its parts. Further, what hinders a thing from moving or acting in accord with its own impulse is said to hold it—for example, the pillars hold the weight lying on them, and, as the poets say, "Atlas holds up the heaven,"[234] on the supposition that it would fall to the earth otherwise, as some of the natural scientists also say.[235] This is also the way in which what holds things together is said to have them held together, on the supposition that they would otherwise separate, each in accord with its own impulse. Also, things are said to be in something in ways that are similar to and correspond to those in which they are said to have them.

5.24
Of (From)

Something is said to be of (from) something in one way if it is of it as matter, and this in two ways, either with respect to the first kind or with respect to the ultimate form—for example, in one way everything meltable is of water, but in another way a statue is of bronze. In another way, if it is of it as of a first starting-point of having moved—for example, what did the fight come of? It came of abusive language, because this was the starting-point of the fight. In another way, as of the composite of matter and shape—as the parts are of the whole, and the verse of the *Iliad*, and the stones of the house; for the shape is an end, and what possesses its end is complete. In other cases, as the form is composed of its parts—for example, the human of two-footed and the syllable of the letter; for this is different from the way in which the statue is composed of bronze; for a composite substance is composed of perceptible matter, but the form is also composed of the matter of the form.[236]

Some things, then, are said to be of (from) something in these ways; but others, if one of these ways holds with reference to a part of them—for example, the child is of its father and mother, and plants are of the earth, because they are of a part of these things. In another way, something is said to come of something if it comes after it in time—for example, night comes of day and a storm comes of good weather, because one comes after the other. Among these things, some are said to do so because they admit of change into each other, as in the cases mentioned just now, others merely because they are successive in time—for example, the voyage took place of the equinox, because it took place after the equinox, and the festival of the Thargelia comes of the Dionysia, because after the Dionysia.[237]

234. Hesiod, *Theogony* 517.
235. *Cael.* 284a24–26.
236. I.e., the formal elements from which the form is composed.
237. The first is a feast of Apollo held in Athens and some other cities in late May, the second a feast of Dionysus held in Athens at the end of March.

5.25
Part

What is said to be a part in one way is what a quantity can in any way be divided into; for what is subtracted from a quantity insofar as it is a quantity is always said to be a part of it—for example, two is said to be a part of three. In another way, only those among the first lot that are measures[238]—which is why two is said to be part of three in one way, while in another way it is not. Further, what the form—quantity aside—can be divided into are also said to be parts of it; that is why the forms of a kind are said to be its parts. Further, the things into which a whole, whether a form or something that has a form, is divided, or of which it is composed—for example, of the bronze sphere or the bronze cube both the bronze (that is, the matter in which the form is) and the angle[239] are parts. Further, the things in its account that make a given thing clear are also parts of the whole[240]—which is why the kind is said to be a part of the form, although in another way the form is a part of the kind.

5.26
Whole

Something is said to be a whole: If none of the parts of which it is said to be by nature a whole is absent from it. If it is what encompasses the things it encompasses in such a way that they are one, and this in two ways—either as each being one or as together composing one. For what is universal, and in general, what is supposed to be such when one says "as a whole," is universal as encompassing many things by being predicated of each of them, and by all of them—each one of them—being one thing, as human, horse, and god are, because all are living things. But what is continuous and limited is a whole when it is one thing composed of many things, especially if they are present in it potentially, but, failing this, if they are actively present in it. Among these themselves, those which are by nature of such a sort are wholes to a higher degree than those that are so by craft, as we also said[241] in the case of one, wholeness being in fact a sort of oneness.

Further, of quantities that have a starting-point, a middle, and an end, those to which the position of the parts makes no difference are said to be alls, and those to which it does, wholes. Those that admit of both are both wholes and alls. These are things whose nature remains the same when the parts change position while their shape does not remain the same—for example, wax or a cloak; for they are said to be both wholes and alls; for they have both characteristics. Water, and all liquids and

238. $1052^{b}20$–27.
239. I.e., the form definitive of the figure.
240. I.e., the whole form.
241. $1016^{a}4$.

number, are said to be alls, but things are not said to be the whole number or the whole water except by metaphorical transference.

Things to which "all" is applied as to one thing are said to be all, "all" being applied to them as divided up—all *this* number [of units], but *all these* units.

5.27
Docked

Not just any random quantity is said to be docked; on the contrary, it must be divisible into parts and also a whole. For not only is two not docked if one of its pair of ones is subtracted (for what is subtracted by docking and what remains are never equal), but, in general, no number is docked in this way; for it is also necessary that the substance remain: if a cup is docked, it must still be a cup, while the number is no longer the same. Further, not even all things that have dissimilar parts are said to be docked (for in one way a number has dissimilar parts too—for example, two and three). But, in general, none of the things to which the position of the parts makes no difference—for example, water and fire—are said to be docked. On the contrary, to be of this sort a thing must in virtue of its substance have parts with position. Further, it must be continuous; for a musical scale is composed of non-uniform parts and parts that have a position, but cannot become docked. In addition to this, not even the things that are wholes are docked by the privation of any part whatever; for the parts must be neither those that control its substance[242] nor those positioned just anywhere—for example, a cup is not docked if a hole is bored in it, but only if the handle or a projecting part is removed, and a human being, not if some flesh or the spleen is removed, but if an extremity is—and this not any extremity but one that when wholly removed cannot grow back. That is why bald people are not docked.[243]

5.28
Kind (Race)

Something is said to be a kind (race), on the one hand, if the coming to be of things with the same form is continuous—for example, "as long as the race of human beings lasts" means as long as the coming to be of human beings is continuous; on the other hand, if it is the first mover that brought things into existence; for it is in this way that some are said to be Hellenes by race and others Ionians, because the former come from Hellen and the latter from Ion as their first begetter. And more so when from the male begetter than when from the matter,[244] although the race is also sometimes

242. 1035ᵇ25–27.
243. *HA* 518ᵇ12–27, *GA* 783ᵇ8–22.
244. *GA* 765ᵇ9–15.

named from the female—for example, the descendants of Pyrrha. Further, as the plane is said to be the kind of plane figures and solid of solids; for each of the figures is, in the one case, a plane of such-and-such a sort and, in the other case, a solid of such-and-such a sort, since this is the underlying subject for the differences. Further, as the first constituent in accounts[245] is said to be—that said in the what-it-is; for this is the kind, whose differences the qualities are said to be.

Something is said to be a kind, then, in all these ways: with reference to continuous coming to be of the same form, with reference to the first mover that is the same in form [as the things it begets], and as matter; for that to which the difference or quality belongs is the underlying subject, which we call "the matter."

Things are said to be distinct [or other] in kind whose primary underlying subjects are distinct, and when the one is not analyzed into the other or both into the same thing—for example, the form and the matter are distinct in kind. As also are those that are said of something with reference to distinct figures of predication of being (for some of the beings signify what-it-is, others a quality, others the various other things that were distinguished previously[246]). These too are neither analyzed into each other nor into some one thing.

5.29
False

What is said to be false in one way is what is false as a thing,[247] and this [in two ways]: Either because it is not combined or cannot be combined—as is said, for example, of the diagonal's being commensurable with the side or of you being seated; for of these the former is always false and the latter sometimes false; for it is in this way that these things are not. Or because, though the things in question *are*, their nature is either to appear not to be such as they are or to be things that are not—for example, illusionistic paintings or dreams; for these are something, but are not the things whose appearance they produce in us. Things are said to be false in these ways, then, either because they themselves are not or because the appearance they give rise to is of something that is not.

A false account, insofar as it is false, is of things that are not, which is why every account is false of something other than what it is true of—for example, the account of a circle is false of a triangle. Each thing has in a way one account, that of its essence, and in a way many, since both it itself and it with an affection are in a way the same (for example, Socrates and musical Socrates), while a false account is, unconditionally, not the account of anything. That is why Antisthenes was naive in thinking that nothing could be fairly put into words except by means of the account that properly

245. $1037^{b}29–30$, *Top*. $142^{b}27–29$.
246. $1017^{a}24–27$.
247. $1051^{a}34–^{b}6$.

belonged to it, one to one.[248] From which it followed that there was no such thing as contradicting, and almost that there was no such thing as speaking a falsehood either. But it is possible to put a given thing into words not only by means of the account of itself but also by means of the account of something else. This may be done altogether falsely indeed, but also in a way truly—for example, eight is a double number by the account of two.[249]

1025a1 These things, then, are said to be false in these ways. But a false human being is one who readily and by deliberate choice gives false accounts, not because of something else but because of giving false accounts itself, and who produces such accounts in other people, just as we say things are false when they produce a false appearance in us. That is why the argument in the *Hippias*,[250] that the same human being is false and true, is misleading. For it assumes that someone is false if he is capable of falsity, that is, the one who knows and is wise, and further, that someone who voluntarily does base actions is better. This false assumption is due to the induction;[251] for someone who limps voluntarily is better than one who does so involuntarily—if by "limping" is meant pretending to limp, since if someone were really lame voluntarily, he would presumably be worse, as in the case of character.

5.30
Coincident

Something is said to be a coincident when it belongs to something and can be truly said of it, but neither of necessity nor for the most part—for example, if someone digging a hole for a plant has found treasure. This—the finding of treasure—is therefore a coincident of the person who is digging the hole; for neither does the one of necessity come from the other, or after the other, nor, if someone plants something, does he for the most part find treasure. Also, a musical person might be pale. But since this does not happen of necessity or for the most part, we say it is a coincidence. So, since there are things that belong and things they belong to, and some of them belong to these only in a particular place or at a particular time, whatever belongs to a subject, but not because it was this subject, or the time this time, or the place this place, will be a coincident. Nor, then, is there a definite cause of a coincidence,

248. The idea is that an account that does not exactly fit A, and A alone, is not a false account of A, but rather is not an account of A at all. Antisthenes evidently combined this idea with the view that the what-it-is or essence of simple things cannot be said or defined (1043b23–32).
249. A number m is a double number when there is a number n such that $m = 2 \times n$. Hence the account of 2 is part of the account of a double number. The number 8 can then be correctly put into words or symbols as $2 \times (2 \times 2)$, using the account of something other than itself. Similarly 9 can be falsely put into words, using the account of something else, as it is when we define it as a double number.
250. Plato, *Hippias Minor* 365d–369b.
251. At *Hippias Minor* 373c–376c.

but a random one, that is, an indefinite one. Going to Aegina was a coincidence, if someone went not because he set out to visit there, but because he was carried off course by a storm or captured by pirates. The coincidence took place, then, or exists but not insofar as it is itself, but insofar as it is another thing; for the storm was the cause of his getting to the place to which he was not sailing, and this was Aegina.

Things are said to be coincidents in another way too: whatever belongs to each thing intrinsically but is not in its substance, as, for example, having its interior angles equal to two right angles does to the triangle. And coincidents of this sort may be eternal, while no coincident of the other sort is. The account of this is elsewhere.[252]

BOOK 6 (EPSILON)

1025^{b}1

6.1[253]
The Three Theoretical Philosophies

It is starting-points and causes of the beings that are being inquired about, and clearly qua beings. For there is some cause of health and of good physical condition, and there are starting-points, elements, and causes of the objects of mathematics, and in general, every science that proceeds by thinking or that has some share in thinking is concerned with causes and starting-points, whether more exactly or more simply considered. All these sciences, however, mark off a certain being, that is, a certain kind, and busy themselves with it, but not with being unconditionally, or qua being, nor do they produce any account of the what-it-is. Instead, starting from the what-it-is—some making it clear by means of the perceptual modalities, some getting hold of it as a hypothesis—they in this way proceed to demonstrate the things that belong intrinsically to the kind with which they are concerned, either in a more necessary or in a weaker way. Which is why it is evident from such an induction[254] that there is no demonstration of [the] substance nor of the what-it-is, but some other way of making it clear. Similarly, they say nothing as to whether the kind they busy themselves about does or does not exist, because it belongs to the same sort of thinking to make clear both its what-it-is and whether it exists.[255]

But since natural science too is a science concerned with a particular kind of being (for it is concerned with the sort of substance in which the starting-point of movement and of rest is internal to itself), it is clear that it is neither a practical science nor a productive one (for in the case of producible things the starting-point is in the producer, whether this is understanding, craft, or some capacity, while in the case of

252. 6.2–3, 11.8, *APo*. 75^{a}18–22.
253. Cf. 5.1, 11.7.
254. I.e., the review of the various special sciences that has just been summarized.
255. *APo*. 93^{a}16–20.

things doable in action it is in the doer, the deliberate choice; for what is doable in action and what is deliberately choosable are the same), so that if all thought is either practical, productive, or theoretical, natural science would have to be some sort of theoretical science—but a theoretical science that is concerned with the sort of being that is capable of being moved, and that in accord with its account holds for the most part, and is not separable only.

But one must not overlook the way the essence or its account is, because, without this, inquiry produces no result. Among things defined, however, that is, of the whats that things are, some are the way the snub is, others the way the concave is. And these differ because the snub is grasped in combination with the matter (for the snub is a concave nose), while the concavity is without perceptible matter. If, then, all natural things are said the way the snub is (for example, nose, eye, face, flesh, bone, and in general, animal, and leaf, root, bark, and in general, plant—for the account of none of these is without [reference to] movement, but always includes matter), the way one should inquire about and define the what-it-is in the case of natural things is clear, as is why it belongs to the natural scientist to get a theoretical grasp even on a certain [part of the] soul, that is, on as much as is not without matter.[256]

That natural science is a theoretical science, then, is evident from these considerations. Mathematics too is a theoretical one, but whether its objects are immovable and separable is not now clear; however, it is clear that some parts of mathematics get a theoretical grasp on their objects insofar as they are immovable and insofar as they are separable.[257] But if there is something that is eternal and immovable and separable, it is evident that knowledge of it belongs to a theoretical science—not, however, to natural science (for natural science is concerned with certain movable things)[258] nor to mathematics, but to something prior to both. For natural science is concerned with things that are separable but not immovable, while certain parts of mathematics are concerned with things that are immovable and perhaps not separable but as in matter. The primary science, by contrast, is concerned with things that are both separable and immovable. All causes are necessarily eternal, and these most of all; for they are the causes of the divine beings that are perceptible.[259] So there must be three theoretical philosophies: mathematical, natural, and theological; for it is not unclear that if the divine belongs anywhere, it belongs in a nature of this sort. And of these, the most estimable must be concerned with the most estimable kind. Of the various sciences, then, the theoretical ones are the more choiceworthy, and this of the theoretical ones.

For one might raise a puzzle as to whether the primary philosophy is universal or concerned with a particular kind and one particular nature (for it is not the same way

256. *DA* 403a3–b16, 429a22–25.
257. *Ph.* 193b31–194a12.
258. Reading περὶ … φυσικὴ.
259. I.e., the immovable movers of the stars and heavenly bodies. See 12.8, 1072a26–30, 1073a23–b1, *Cael.* 285a29–30.

even in the mathematical sciences, but rather geometry and astronomy are concerned with a particular nature, while universal mathematics[260] is common to all). If, then, there is not another sort of substance beyond those composed by nature, natural science will be the primary science. But if there is some immovable substance, this [theological philosophy] will be prior and will be primary philosophy, and it will be universal in this way, because it is primary.[261] And it will belong to it to get a theoretical grasp on being qua being, both what it is and the things that belong to it qua being.

6.2
Coincidental Being and What Happens for the Most Part

But since being is said unconditionally of things in many ways, of which one, we saw,[262] is coincidentally, another as being true, and not being as false, while beyond these there are the figures of predication (for example, what a thing is, quality, quantity, place, time, and anything else that being signifies in this way), and beyond these again potential being and active being—since, then, things are said to *be* in many **1026^{b}1** ways, about the coincidental sort it must first be said that there can be no theoretical investigation concerning it.

A sign of this is that no science—whether practical, productive, or theoretical—pays attention to it. For someone who produces a house does not produce all the things that coincide with the house at the time it is coming into being; for these are unlimited in number; for there is nothing to prevent the house he has produced from being pleasant to some, harmful to others, and beneficial to others, and from being distinct from (one might almost say) all the other beings. But the craft of building is not productive of any of these.[263] In the same way, a geometer does not get a theoretical grasp on what is in this fashion coincidental to his figures, nor whether a triangle and a triangle having interior angles equal to two right angles are distinct.[264] And this happens reasonably; for "coincidental" is like "in name only."

That is why Plato was in a way not wrong when he classified sophistic as being concerned with what is not.[265] For the arguments of the sophists[266] are (one might almost say) above all else concerned with the coincidental—for example, whether musical and grammatical, or musical Coriscus and Coriscus, are distinct or the same,

260. *APo*. $74^{a}17–25$, $76^{a}37–^{b}2$.
261. So it must deal with starting-points and causes that are prior to those of the others, so that those starting-points and causes too fall within its explanatory scope.
262. 5.7.
263. *NE* $1139^{b}1–4$.
264. This is a question for a philosopher ($1004^{b}1–3$, $1026^{b}15–21$).
265. *Sophist* 254a.
266. $1064^{b}23–28$, *Top*. $104^{b}25–27$, *SE* $178^{b}39–179^{a}3$.

or whether everything that is, but is not always, has come to be, so that if someone who was musical has come to be grammatical, he must also have been grammatical and come to be musical, and all the other arguments of this sort; for what is coincidental is evidently somewhat close to what is not. As is also clear from arguments such as this: with things that are in another way there is coming to be and passing away, but with things that are coincidentally there is not.[267]

Nonetheless, as regards the coincidental, it must, as far as possible, be said further what its nature is and due to what cause it exists; for it will perhaps also be clear at the same time why there is no science of it.

Since, then, among the beings, some are always and of necessity the way they are (not in the sense in which something is said to be forced but in the sense in which we say that it does not admit of being otherwise), while others are the way they are neither of necessity nor always but for the most part—this is [the] starting-point and this the cause of the existence of the coincidental; for what is neither always nor for the most part is what we say is coincidental. For example, if in the dog days storm and cold occur, that is a coincidence we say, but not if there is stifling heat, because, while the latter occurs always or for the most part, the former does not. Also, that the human is pale is coincidental (for he is neither always nor for the most part so), but he is not an animal coincidentally. And that the builder cures someone is coincidental, because it is not the builder who naturally does this but the doctor—but the builder was by coincidence a doctor. And the gourmet cook, aiming to give pleasure, might produce something healthy,[268] but not in accord with the craft of gourmet cooking. That is why it was a coincidence, we say, and in a way he produces it, but not unconditionally. For of other things there are sometimes capacities that are productive of them, while of some there is no definite craft or capacity; for of things that are or come to be coincidentally the cause too is coincidentally a cause.

And so since not all things either are or come to be of necessity and always, but most are for the most part, what is coincidentally must of necessity exist—for example, a pale human is neither always nor for the most part musical, but since this happens sometimes, it will be coincidentally—otherwise everything will be of necessity. So the matter that is capable of being otherwise than it for the most part is will be the cause of the coincidental.[269]

One must grasp this starting-point[270] [when one asks] whether there is nothing that is neither always nor for the most part or whether this is impossible. There is, therefore, something beyond these, what is so by luck and coincidentally. But while

267. Pale Coriscus is a coincidental being. If it comes to be or passes away both Coriscus and pale would have to come to be or pass away. But pale, since it is not a substance, cannot do either.

268. Reading τι ὑγιεινόν. The end or goal intrinsic to gourmet cooking is pleasure, not health. See *NE* 1153ᵃ26–27.

269. *GA* 778ᵃ4–9.

270. I.e., the matter.

it belongs to some things to be for the most part, does it belong to none to be always, or is there something eternal? These issues, then, must be investigated later on.[271] But that there is no scientific knowledge of the coincidental is evident; for all scientific knowledge is either of what always is or of what for the most part is; for how else could one learn, or teach someone else? For a thing must be determined either by what is always so or by what is for the most part so—for example, that honey-water is beneficial to a fever patient for the most part. But the exceptions to this cannot be stated,[272] I mean, the times when this does not happen—for example, on the day of the new moon; for it is either always or for the most part that even what happens on the day of the new moon happens. But the coincidental is an exception to that.

What the coincidental is, then, and due to what cause, and that there is no scientific knowledge of it, has been stated.

6.3
Starting-Points of What Happens by Luck

It is evident that there are starting-points and causes that can come to be and pass away without going through a process of coming to be and passing away. For otherwise everything will be of necessity—if whatever is coming to be and passing away must have something that is non-coincidentally its cause. Will this be or will it not? It will if this comes to be; but if not, it will not. And this will if something else does. And in this way it is clear that, since time is always being subtracted from a limited period of time, one will come to the present moment.

So this person will die by violence if he goes out; and he will do this if he gets thirsty; and he gets thirsty if something else; and in this way one will come to what [affections] belong to him now, or to something that has come about—for example, if he gets thirsty, and he does so if he is eating something spicy. And this [affection] either belongs to him or it does not. And so of necessity he will die, or of necessity not die. Similarly, if one jumps over to what has come to be, the same argument applies; for this [affection], I mean the one that has come to be, is already present in something, therefore, everything that will be will be of necessity—for example, that the person who is living dies; for already something has come to be—for example, the presence of contraries in the same thing. But whether by disease or violence is not yet [necessary], but [will be] if this comes about. It is clear, therefore, that it goes back as far as some starting-point, but this one no longer goes back to something else. This, then, will be the starting-point of what happens by luck, and nothing else will be the cause of its coming to be. **$1027^{b}1$**

271. 12.6–8.
272. *Rh.* $1374^{a}32–33$.

But to what sort of starting-point and to what sort of cause we are in this way referred, whether to matter or to the for-the-sake-of-which or to what gets things moving, must be investigated to the fullest extent.[273]

6.4
Being True and Being False

As regards coincidental being, then, let us put it aside; for it has been made sufficiently determinate. As for being as being true and not being as being false, it depends on[274] composition and division, and together have to do with the allocation of a contradictory pair[275] (for truth has affirmation in the case of what is put together and negation in the case of what is divided, while falsehood has the contradictory of this allocation; but the way that understanding things at the same time or separately comes about requires another account,[276] but I mean "at the same time" as opposed to "separately" to imply that what comes about is not a succession of things but a single thing). For falsehood and truth are not in the things, as if the good were true and the bad false from the outset, but in thought, and with regard to simple things and the what-it-ises, not even in thought. Since all this is so, then, what should be done to get a theoretical grasp on this way of being and not being must be investigated later on.[277]

But since the connection and division are in thought and not in the objects, being in this sense is a different thing from being in the strict sense (for thought joins or subtracts[278] either the what-it-is or a quality or a quantity or something[279] else), being coincidentally and being as being true may be left aside—for the cause of the former is indefinite, while that of the latter is a certain affection of thought, and both are concerned with the remaining kind of being, and do not indicate any nature of being as being external.[280] Because of that one must leave them aside and investigate being itself and its causes and starting-points qua being.

It is evident in our discussions of the various ways in which things are said to *be* that they are said to *be* in many ways.

273. The formal cause is omitted because what happens coincidentally or by luck cannot have such a cause, since it cannot have the sort of scientific explanation that begins with a definition of a form or essence.
274. Reading παρὰ.
275. *Int.* 16ᵃ9–18.
276. 1051ᵇ30–1052ᵃ4.
277. 9.10.
278. Reading ἀφαιρεῖ.
279. Reading τι.
280. I.e., outside the already established categories of beings. Cf. 1065ᵃ24.

BOOK 7 (ZETA)[281]

7.1
Substance as Primary Being

Something is said to *be* in many ways, as we distinguished previously in our discussion of the many ways;[282] for, on the one hand, being signifies the what-it-is and a this something, and, on the other, quality, quantity, or one of the other things predicated as these are. But while things are said to *be* in these many ways, it is evident that primary among these is the what-it-is, which is precisely what signifies substance (for when we say how this thing is qualified, we say that it is good or bad, but not that it is three cubits or a human, while when we say what it is we do not say pale or hot or three cubits, but a human, or a god), and the other things are said to *be*, some by being quantities of what is a being in this way, others qualities, others affections, others something else of this sort.

That is why one might indeed be puzzled about whether walking, being healthy, and sitting are each of them a being or not a being, and similarly too in the case of any other thing of this sort; for none of these is either by its nature intrinsically a being or capable of being separated from substance but, if anything, it is the walking thing that is a being, and the sitting thing, and the one being healthy. These things are manifestly beings to a higher degree, because there is some definite underlying subject for them (and this is the substance and the particular), which is precisely what is made apparent in this sort of predication; for good and sitting are not so said without this. It is clear, then, that it is because of this that each of these other things is as well, so that what primarily is—not is something [else] but is unconditionally—would be substance.

Things are said to be primary in many ways. Nonetheless, substance is primary in all of them—in nature,[283] in account, in knowledge, and in time. For of the various things that are predicated none is separable, but only this. And in account too it is primary (for in the account of each thing the account of substance is necessarily present as a component). And we think we know each thing most of all, when we know, for example, what a human is, or fire, rather than when we know the quality or the quantity or the place, since of these things themselves too we know each one when we know, for example, what the quantity or the quality is. And, in particular, the question **$1028^{b}1$** that was asked long ago, is now, and always will be asked, and is always giving rise to puzzles—what is being?—is just the question, what is substance? (for this is what some people say is one, others more than one, some that it is a limited number, others

281. Text: M. Frede and G. Patzig, *Aristoteles Metaphysik Z: Text, Übersetzung und Kommentar* (Munich, 1988).
282. 5.7.
283. Reading φύσει καὶ.

an unlimited one[284]). And that is why we too must most of all, primarily, and (one might almost say) even exclusively get a theoretical grasp on what it is that is a being in this [substantial] way.

7.2
Are There Any Substances beyond Perceptible Ones?

Substance seems to belong most manifestly to bodies. That is why we say that animals and plants and their parts are substances, and also natural bodies, such as fire, water, earth, and each thing of this sort, together with all their parts and all the things composed of these, whether of parts or of wholes (for example, the heaven and its parts, stars, moon, and sun), but whether these alone are substances, or others as well, or some of these and some others as well, or none of these but some others, must be investigated.[285]

It seems to some people[286] that the limits of body—for example, surface, line, point, and unit—are substances, and more so than body and solid. Further, some do not think that beyond the perceptible things there is anything of this sort, while others think that there are more [substances than that] and that they are substances to a higher degree, because they are eternal. Thus Plato[287] thought that the Forms and the objects of mathematics were two sorts of substances, and that the substance of perceptible bodies was a third. And Speusippus thought that there were even more substances, starting from the one, as well as starting-points for each sort of substance, one for numbers, another for magnitudes, and then another for the soul; and by going on in this way he multiplies the substances. And some say[288] that the Forms and the numbers have the same nature, and that the others—lines and planes—follow after them, right up to the substance of the heaven and the perceptibles.

Concerning these issues, then, what is said correctly or incorrectly—that is, which things are substances, and whether there are any beyond the perceptible ones or not, and the way these latter ones are, and whether there is any sort of substance that is separate, and if so why and in what way, or whether there is none beyond the perceptibles—must be investigated, after first having given a sketch of what substance is.

284. The Milesians and the Eleatics; the Pythagoreans, Empedocles, and his followers; Anaxagoras and the atomists.
285. 1040[b]5–10, 1041[b]28–30, 1043[b]21–23.
286. 992[a]20–22, 996[a]12–15, 1001[b]26–1002[b]11.
287. 1.6, 1.9.
288. 1069[a]35, 1080[b]21–23, 1083[b]1–3, 1086[a]5–6, 1090[b]31–32.

7.3
Sketch of Substance

Something is said to be substance, if not in more ways, at any rate, most of all in four; for in fact the essence, the universal, and the kind seem to be the substance of each thing, and fourth of these, the underlying subject.

The underlying subject is that of which the other things are said, but which is not itself further said of any other thing, which is why some determinations must be made about it first; for the primary underlying subject seems most of all to be substance. **1029^{a}1**

In one way the matter is said to be a thing of this sort, in another way the shape, and in a third what is composed of these (by "the matter" I mean, for example, the bronze; by "the shape," the configuration of the form as it is presented to sight; and by "what is composed of these," the statue—the compound). So if the form is prior to the matter and more of a being, it will also be prior to what is composed of both of them, for the same reason.

It has now been said in outline what substance is: what is not said of an underlying subject, but of which the other things are said. But one should not say only this; for it is not enough; for it itself is unclear, and besides the matter becomes substance. For if this is not substance, it escapes us what else is; for when the others are stripped away, nothing appears to remain; for while the others are affections, doings, and capacities of bodies, length, breadth, and depth are quantities and not substances (for quantity is not substance). Rather, that primary thing to which these belong, *that* is substance. But when length, breadth, and depth are subtracted, we see nothing left, unless it is something that is given definition by these, so that the matter alone must appear to be substance for those investigating in this way (by "matter" I mean that which, intrinsically, is neither said to be a something, nor a quantity, nor anything else by which being is given definition). For there is something that each of these is predicated of, whose being is distinct from that of each of the things predicated (for while the other things are predicated of the substance, this is predicated of the matter), so that the last thing [in this series] will not be intrinsically a something, or a quantity, or anything else; nor indeed is it the negations of these, for they too will belong to it coincidentally.

For those who try to get a theoretical grasp on things in this way, then, the matter turns out to be substance. But this is impossible; for both separability and being a this something seem to belong most of all to substance, and, because of this, the form and the thing composed of both would seem to be substance more than the matter is. But the substance that is composed of both (I mean from both the matter and the shape) must be set aside, for it is posterior, and clear; and the matter too is in a way evident. But the third must be investigated, for it is the most puzzling. It is agreed that some perceptibles are substances, so that it is among these that it should first be looked for.

{For it furthers the work to proceed toward what is better known. For learning comes about for all in this way—through things by nature less well-known toward ones that are better known. And just as with things in the sphere of action our work is to begin from things that are good for each particular person and make things that are wholly good good for each particular person, so too the work here is to begin from things better known to oneself and make the things that are known by nature known to oneself. But the things that are known and primary for particular groups of people are often only slightly known and have little or nothing of being in them. Nonetheless, beginning from things that are poorly knowable but knowable to ourselves, we must try to know the things that are wholly knowable, proceeding, as has just been said, through the former.}[289]

7.4
Logico-Linguistic Investigation of Essence and Definition

1029b1 Since at the start we determined[290] in how many ways we define substance, and of these one seemed to be the essence, it is necessary to get a theoretical grasp on it.[291] And first let us say some things about it in a logico-linguistic way, because the essence of each thing is what it is said to *be* intrinsically. For the being for you is not the being for musical; for you are not intrinsically musical. [Your essence], therefore, is what you are [said to *be*] intrinsically. But not, certainly, all of this; for what is intrinsic in this way is not so in the way that pale is to surface, because the being for a surface is not the same as the being for pale. But neither is it the being that is composed of both, the being for a pale surface. Why? Because surface itself is added. Therefore, the account in which the thing itself is not present, but it itself is said, this is the account of the essence for each thing. And so, if the being for a pale surface is the being for a smooth surface, the being for pale and for smooth will be one and the same.

But since there are composites in accord with the other categories too (for there is some underlying subject for each—for example, for the quality, the quantity, the time, the place, and the movement), whether there is also an account of the essence for each of these must be investigated, and whether the essence belongs to them too—for example, to pale human.[292] Let us, then, give this the name "cloak." What is the being for a cloak? But then this is not one of the things said to *be* intrinsically either. Or, are things said intrinsically *not to be* in two ways, one being from an addition and the other not? For in one case what is being defined is said to *be* by being added to another thing—for example, if someone defining the being for pale were to state the account of pale human; in the other case, what is being defined is said to *be*

289. This paragraph follows 1029b13 in the mss.
290. 1028b33–1029a2.
291. Because essence is the better-known route to form, which is the target (1029a32–34).
292. 1070b16–21, 1089b27–28.

by another thing not being added to it—for example, if cloak signified pale human, but someone were to define the cloak as pale. (The pale human is indeed something pale in that case, but not, surely, what being for pale was.) **1030^{a}1**

But [what about] the cloak? Is the being for it an essence at all? Or not? For the essence is precisely what something is. But when one thing is said of another, it is not precisely a this something—for example, the pale human is not precisely a this something, if indeed the this belongs only to substances. So there will be an essence only of those things whose account is a definition. There is a definition, however, not when a name and an account signify the same thing (for then all the accounts would be definitions; for there will be a name answering to any account whatever, so that even the *Iliad* will be a definition), but when the account is of something primary; and primary things are those that are said not by way of saying one thing of another. Therefore, the essence will belong to things that are forms of a kind and to nothing else (for these seem not to be said by way of participation or as an affection, or in a coincidental way).[293] But there will be an account of each of the other things too and what it signifies, [stating] if it is a name, that this belongs to this, or, instead of a simple account, a more exact one. There will not, however, be a definition or an essence.

Or is something said to be the definition in many ways too, just like the what-it-is? For in fact the what-it-is signifies in one way the substance and the this something, and in another way it signifies each of the other things that are predicated—quantity, quality, and the like. For just as *is* also belongs to all of them, but not in the same way, but to one in a primary way and to the others in a derivative one, so too the what-it-is belongs unconditionally to the substance and in a way to the others; for we can also ask what quality is, and so quality too is something with a what-it-is—but not unconditionally. Rather, just as in the case of what is not, some people say in a logico-linguistic way that what is not is (not that it is unconditionally but that it is what is not), so too with the quality.

One should, then, also investigate how one should speak about each of them, but not more so than how the thing in fact is. That is why now too, since what is said is evident, it is also evident that the essence will belong in a similarly primary and unconditional way to the substance, and derivatively to the others, just as with the what-it-is—not the unconditional essence, but the essence for a quality, or for a quantity. For it must either be homonymously that one says that these things are beings, or by adding something or by subtracting something, just as what is not scientifically known is scientifically known,[294] since what is correct, surely, is that they are said [to be] neither homonymously nor in the same way, but as with medical, with reference to one and the same thing[295]—not saying one and the same thing, but not speaking homonymously either; for a body, a work, and an implement are said **1030^{b}1**

293. 1037^{b}14–21.
294. By subtracting "not."
295. 1003^{a}34–^{b}10.

to be medical neither homonymously nor in accord with one thing, but rather with reference to one thing. But whichever of the two ways one proposes to say that these things [are beings] makes no difference. This, however, is evident: that in the primary and unconditional way definition and the essence belong to substances—not that they do not also equally belong to the other things, except not in the primary way.

For it is not necessary, if we accept this view, for there to be a definition of this sort whenever a name signifies the same thing as an account, but rather the same thing as an account of a certain sort, and this occurs if it is of something that is one—not by continuity, like the *Iliad*, and not in the way in which things are one by being tied together, but one in the ways in which things are said to be one. But things are said to be one as they are said to *be*, and being signifies, on the one hand, the this something and, on the other, some quality or quantity. That is why there will be an account of pale human and a definition, but in another way than there is of the pale and of substance.

7.5
Definition Continued

There is a puzzle, if one denies that an account composed from an addition[296] is a definition, as to whether there will be a definition of any of the things that are not simple but coupled; for these must be indicated by an addition. I mean, for example, there is nose and concavity, and snubness is what is said of things composed of both, as this in this. And it is not coincidentally that the concavity or the snubness is an affection of the nose, but intrinsically—not in the way that the pale is of Callias, or of a human (because Callias, who is coincidentally a human, is pale) but in the way that male is of animal, or equal of quantity, and in the way all things are that are said to belong to something intrinsically. These are the ones in which belongs either the account or the name of that of which this is the affection, and which cannot be indicated separately, in the way that pale can be indicated without human, but not female without animal. So either there is no essence or definition of any of these [coupled] things, or, if there is, it is in another way, as we said.[297]

But there is also another puzzle about these things. For if snub nose is the same as concave nose, the snub and the concave will be the same. But if they are not the same, because it is impossible to say snub without saying the thing of which it is an intrinsic affection (for the snub is concavity in a nose), it must either be impossible to say the snub nose, or the same thing will be said twice, concave nose nose (for the snub nose will be the concave nose nose). That is why it is absurd that the essence should belong

296. 1031[a]4–5.
297. 1030[a]17–[b]13.

to things like this. If it does, it will go on without limit; for in snub nose nose there will be yet another one.

It is clear, therefore, that only of substance is there a definition. For if there were also a definition of the other things that are predicated, it would necessarily be composed from an addition, like that of odd; for it is not definable without number, or female without animal. (By "addition" I mean the cases in which it turns out that the same thing is said twice.) **1031a1**

But if this is true, things that are coupled—for example, odd number—will not have a definition either (but this escapes notice because their accounts do not describe them in an exact way). But if there are also definitions of these, either it must be in another way or, as was said, things must be said to be the definition and the essence in many ways, so that in one way there will not be any definition or any essence that belongs to anything except the substances, and in another way there will.

It is clear, then, that the definition is the account of the essence, and that the essence is either of the substances alone, or of them most of all, primarily, and unconditionally.

7.6
Is Each Thing the Same as Its Essence?

But whether each thing and its essence are the same or distinct must be investigated. For this will further the work relating to the investigation concerning substance; for each thing seems to be nothing other than its own substance, and the essence is said to be the substance of each thing.

In the case of things said coincidentally they would seem to be distinct—for example, a pale human seems to be distinct from the being for a pale human (for if they were the same, the being for human and for pale human would be the same; for a human and a pale human are the same, as people say, so that the being for a pale human and for a human would be the same too. Or is there no necessity for things that are coincidentally [the same] to be the same? For the extreme terms do not become the same in the same way.[298] But perhaps this might seem to follow, that the extreme terms would be the same coincidentally—for example, the being for pale and the being for musical. But it seems not to.

In the case of things that are said to *be* intrinsically, however, is it necessary that the thing be the same [as its being or essence]? For example, if there are some substances to which no substances or any other natures are prior, of the sort that some

298. (1) A pale human = the being for a pale human. (2) A human (who is coincidentally pale) = a human. (3) A human = the being for a human. (4) Therefore, the being for a human = the being for a pale human. But (4) is false, since someone can be a human without being pale, and so (1) must be false. The extreme terms are those in (4), "the being for a human" and "the being for a pale human."

people say the Forms are? For if the good-itself and the being for a good are distinct, also animal[-itself] and the being for an animal, also the being for a being and being, **1031ᵇ1** there will be other substances and natures and Forms beyond those mentioned, and these other substances will also be prior, if the essence is substance. And if the two are detached from each other, there will be no scientific knowledge of the former ones, while the latter ones will not be beings (by "detached from each other" I mean if the being for a good neither belongs to the good-itself nor being good to the being for a good); for there is scientific knowledge of each thing when we know its essence. And what holds in the case of the good holds equally for the others, so that if not even the being for a good is a good, neither will the being for a being be a being, nor will the being for a one be a one. Similarly, either all the essences are, or none of them are, so that if not even the essence for a being is a being, none of the others is either. Further, that to which the essence for a good does not belong is not a good.

The good, therefore, is necessarily one with being for a good, and similarly beauty and being for a beauty, and so with all things that are not said to *be* with reference to something else but are intrinsic and primary; for in fact it is enough if this feature belongs to them, even if they are not Forms, but more so, presumably, if they are Forms. At the same time, however, it is also clear that if indeed the Forms are as some people say they are, the underlying subject will not be substance; for the Forms are necessarily substances, but not by being [predicated of] an underlying subject; for then they will *be* in accord with participation.

On the basis of these arguments, then, each thing itself and its essence are one and the same, and not in a coincidental way, and because to scientifically know each thing is just to scientifically know its essence, so that, even by setting-out, the two must be one and the same.

But of what is said to *be* coincidentally, for example, the musical or the pale, because it has a double signification, it is not true to say that it and its essence are the same; for in fact what the coincident belongs to is pale as is the coincident, so that in one way it and its essence are the same, and in another not the same; for the pale is not the same as the human, that is, as the pale human, but it is the same as the affection paleness.

The absurdity would become apparent if one assigned a name to each of the essences; for beyond this original one, there will be another—for example, for the essence of a horse there will be another essence for a horse. And yet, even as things stand, what is to prevent some things from being their essences from the outset, if indeed the essence is substance? But then, not only are they one, but also the accounts **1032ª1** of them are the same, as is clear also from what has been said; for it is not coincidentally that one and the being for one are the same. Further, if they are distinct, it goes on without limit; for, on the one hand, there will be an essence for the one and, on the other, there will be the one, so that the same argument will apply to these too.

It is clear, then, that in the case of the things that are primary and that are said to *be* intrinsically, the being for each is one and the same as the thing. And it is evident

that sophistical refutations of this thesis are to be resolved using the same resolution as in whether Socrates and the being for Socrates are the same;[299] for there is no difference either in the materials on the basis of which one would raise one's questions or in those on the basis of which one would find a resolution of them.

In what way the essence of each thing is the same as the thing, then, and in what way it is not the same, has been stated.

7.7
Form in Matter-Form Compounds (1)

Among things that come to be, some do so by nature, some by craft, and some from chance, but they all come to be both as a result of something and of (from)[300] something, and they all come to be something—the something I mean may be of any category; for things come to be a this, or of some quality, or of some quantity, or somewhere.

The natural comings to be are those of the things whose coming to be is from nature. What they come to be of is what we call "matter"; that as a result of which they come to be is something that is by nature a being; and the something they come to be is a human or a plant or something else of this sort, which we say are substances most of all. And all the things that come to be either by nature or by craft have matter; for each of them is capable both of being and of not being, and this capacity is the matter in each. In universal terms, then, that from which is nature, and that in accord with which is nature (for what comes to be has a nature—for example, a plant or an animal), and also that as a result of which. This is the one that is said to be the nature that is in accord with the form, which is the same in form [as what comes to be] (but in another thing; for a human begets a human).

That, then, is the way things come to be that come to be because of nature. The other comings to be are called "productions." And all productions come either from craft, or from some capacity, or from thought. Some of them, however, may come to be by chance or by luck, in much the same way as the ones found in those that come to be because of nature; for sometimes there too some of the same things come to be either from seed or without seed. These, then, must be investigated later on.[301] From craft the things whose form is in the soul come to be (and by "form" I mean the essence of each thing and the primary substance); for even contraries **$1032^{b}1$** in a way have the same form; for the opposing substance is the substance of the privation—for example, health is the substance of disease (for disease is the absence of health), while health is the account in the soul and the scientific knowledge. So what is healthy comes to be when one has understood as follows: since this is what

299. $1037^{a}5–10$, $1043^{b}2–4$.
300. 5.24.
301. $1034^{a}9–21$, $^{b}4–7$.

health is, necessarily if the thing is to be healthy, this must be present—for example, a uniform state—and if the latter is to be present, there must be heat, and the doctor goes on, always understanding in this way, until he is led to a final this that he himself is able to produce. Then the movement from this point onward is called a "production"—the one that leads to being healthy. So it turns out that in a way health is produced from health, and a house from a house, the one that has matter from the one without matter; for the craft of medicine and the craft of house-building are the form of health and of a house (by "the substance without matter" I mean the essence).

Of comings into being and movements, one part is called "understanding" and the other "producing"—what proceeds from the starting-point and form is understanding, what proceeds from the final stage of understanding is producing. And each of the other things—those in between—comes to be in the same way. I mean, for example, if he is to be healthy, he must be made uniform. But what is it to be made uniform? This. And it will come about if he is made warm. And what is it to be made warm? This. And it is present potentially; and for it to be actually present is up to [the doctor] himself. What produces, then, and what the process of becoming healthy starts from, if it is from craft, is the form in the soul, but if it is from chance, it is from whatever it is that is a starting-point of producing for what produces from craft—for example, in the case of healing the starting-point is presumably from the warming, which the doctor produces by rubbing. Warmth in the body, therefore, is either a part of health or else something similar that is part of health follows it, either immediately or by way of several steps, and this last thing that produces health is in this way a part of health,[302] and of a house (the stones, for example), and similarly of other things. So, as was said,[303] coming to be is impossible if there is nothing preexisting.

But that some part must be present is evident; for the matter is a part (for it is this that is present [within the thing] and comes to be [something]). But is it also one of the things in the account? We do speak in both ways when we say what brazen circles are, speaking of the matter when we say that it is bronze, and of the form when we say that it is a shape of such-and-such sort (shape being the kind in which it is first placed). The brazen circle, then, does have the matter in its account.

As for that from which, as matter, they come to be, some, when they have come to be, are said to be not that, but thaten[304]—for example, a statue is not said to be stone, but stonen. The human who is healthy, by contrast, is not said to be of that from which he comes. The cause of this is that although he comes to be from both the privation and from the underlying subject, which we call the "matter" (for example, it is both the human and the sick that come to be healthy), it is rather from the privation, nonetheless, that he is said to come to be—for example, healthy comes from sick rather than from human. That is why the healthy one is not said to be sick, but is

302. *NE* 1144a1–5, *Rh.* 1362a31–34.
303. 983b17–18, 1069b6.
304. "Thaten" corresponds to *ekeininon*, which is an Aristotelian coinage, to which the "en" suffix generates analogs in English.

said to be human, and the human is said to be healthy. In cases where the privations are unclear or nameless, however, such as that of whatever shape it happens to be in bronze, or that of a house in bricks and timbers, the thing seems to come to be from these materials as in the previous case it did from being sick.

That is why, just as in that previous case the thing is not said to be what it is from, so in these cases too the statue is said not to be wood, but by derivation, wooden, and brazen, not bronze, and stonen, not stone, and the house is said to be bricken, not bricks. But it is not the case either that a statue comes to be from wood, or a house from bricks, since if someone looked intensely, he would not say this unconditionally, because what something comes to be from must change, and not remain. That, then, is why they are said in this way.

7.8
Form in Matter-Form Compounds (2)

Since what comes to be, comes to be as a result of something (by which I mean the starting-point of the coming to be) and from something (and let this be not the privation but the matter; for the way in which we say this has already been determined[305]) and comes to be something (and this is either a sphere or a circle or whichever of the others it happens to be), just as the producer does not make the underlying subject (the bronze), so he does not make the sphere either, except coincidentally, because the brazen sphere is a sphere and he does make the former; for to make the this something is to make a this something from what is wholly the underlying subject (I mean that to make the bronze round is not to make the round or the bronze, but a distinct thing: this form in something else; for if the producer makes something, he must make it from something else, for this was assumed[306]—for example, he makes a brazen sphere, but in such a way that from this, which is bronze, he makes this, which **$1033^{b}1$** is a sphere). If, then, he also made this [matter] itself, it is clear that he will make it in the same way, and the productions will go on without limit.

It is evident, therefore, that neither does the form—or whatever one must call the shape that is in the perceptible thing—come to be, nor is there any process of coming to be of it, and the essence does not come to be either (for it is this that comes to be in something else, whether as a result of craft, of nature, or of some capacity). But the producer does make a brazen sphere exist; for he produces it from bronze and sphere; for in this specific thing he produces this specific form, and the result is a brazen sphere. But if there is going to be a coming to be of the being of sphere in general, it will have to be a something [that comes to be] from something. For whatever is coming to be must always be divisible, and be, on the one hand, this, and, on the

305. $1032^{a}17$.
306. $1033^{a}25$.

other, this. I mean, that it must be, on the one hand, the matter and, on the other, the form. If, then, a sphere is the shape that is equidistant from its center, one component of this is what the thing the producer produces will be in, and the other is what will be in that one, and the whole thing is what has come to be—for example, the brazen sphere. It is evident, then, from what has been said, that what is said to be the substance as form does not come to be, but that the compound that is said with reference to this does come to be, and that in everything that comes to be matter is present, and that it is, on the one hand, this and, on the other, this.

Is there, then, any sphere beyond these ones, or any house beyond [that of] bricks? Or would there never have been any coming to be of any this something if there were? But sphere or house signifies such-and-such sort of thing, not a this and a definite thing, and a maker makes or begets from this [matter] such-and-such sort of thing, and, when it has come to be, it is this thing of such-and-such sort. And the whole this—for example, Callias or Socrates—is like this brazen sphere, while the animal and the human are like brazen sphere in general.

It is evident, therefore, that the cause consisting of the Forms (if these are the way some people are accustomed to say the Forms are, things beyond the particulars) is of no use, at any rate, as regards comings to be and substances, and they would not be intrinsically substances because of these.

In some cases indeed it is even evident that the begetter is of this same sort as the begotten (not that they are the same thing, certainly, nor one in number, but one in form)—for example, in the case of natural things (for a human begets a human)—unless something is begotten contrary to nature, as when a horse begets a mule (and even these are similar; for what would be common to both horse and donkey, the closest kind, does not have a name, but would presumably be both, like a mule). So it is evident that there is no need to fabricate a Form as a paradigm (for it was in the case of natural things that Forms were looked for most of all; for these are most of all substances); rather, the begetter is sufficient to produce the thing, and is the cause of the form's being in the matter. And once there is the whole thing, such-and-such sort of form in this flesh and bones, this is Callias or Socrates. And they are distinct because of their matter (for that is distinct), but the same in form (for the form is indivisible).

7.9
Form in Matter-Form Compounds (3)

But one might raise a puzzle as to why it is that some things come to be both by craft and by chance (for example, health), while others do not (for example, a house). The cause is that the matter that serves as the starting-point of the process of coming to be in some cases of producing something, or of something's coming to be by craft, and that has some part of the thing present in it, is of a sort that can be moved by itself,

while in others it is not; and, of the former sort of matter, some can be moved in the particular way required, while some is incapable of it (for many things are capable of being moved by themselves but not in the particular way required—for example, so as to constitute dancing). The things, then, whose matter is of the latter sort—for example, stones—cannot be moved in the particular way required except by something else, although they can in another way.[307] That is why some things will not exist without someone possessing the relevant craft, while others will exist; for movement will be started by those things that do not possess the craft but can be moved by other things that do not possess the craft either, or else from a part [of the product].

It is clear from what has been said that in a way all things come to be from something with the same name, just as in the case of those that do so by nature, or from a part with the same name (for example, the house from a house, insofar as it is a result of understanding; for the craft is the form), or from what has some part of [what comes to be]—that is, if it does not come to be coincidentally; for the primary cause of the production, the intrinsic one, is a part [of the product]. For warmth in the [rubbing] movement produced warmth in the body, and this either is health or a part of it, or a part of health follows it, or health itself does. And that is why it is said to produce the health—because it produces that which the health follows and with which it coincides. So, just as in deductions, the substance is the starting-point of all; for it is from the what-it-is that the deductions come, and from there too the comings to be.

Things composed by nature also have a similarity to these others. For the seed is a producer in the same way as the things that are from craft;[308] for it has the form potentially. And what the seed comes from in a way has the same name [as the offspring], except where there is a deformation; for one should not look for all offspring **$1034^{b}1$** to come to be in the same way as human does from human; for even woman comes from man.[309] That is also why a mule does not come from a mule.

Natural things that come to be by chance, like the ones there [in the crafts], are those whose matter can also be moved by itself with the same movement as the seed moves it. But those whose matter is not capable of this cannot come to be in any other way than from those things [from which they come to be].

It is not only concerning the substance that our account makes clear that the form does not come to be, but also where all the primary things are concerned the account is equally applicable—for example, to quantity, quality, and the other categories. For just as the brazen sphere comes to be but not sphere or bronze, and [the sphere] comes to be in the bronze (for the matter and the form must always be preexistent), that is the way it is too in the case of the what-it-is, of the quality and quantity, and similarly of the other categories; for the quality does not come to be, but wood of

307. The other way is the capacity the sublunary elements have to move to their proper places, unless prevented.
308. *GA* $730^{b}11–23$
309. *GA* $737^{a}18–30$.

that quality, nor does the quantity, but wood or animal of that quantity. And what one grasps from these cases as special to the substance is that it is necessary for there always to preexist another substance, which is actual, to produce it (for example, an animal if an animal is what comes to be), while it is not necessary for the quality or the quantity to preexist actually, only potentially.

7.10
Definition's Relation to Form

Since a definition is an account, and every account has parts, and as the account is to the thing, so the part of the account is to the part of the thing, a puzzle already arises as to whether the account of the parts needs to be present in the account of the whole or not. For in some cases they are manifestly present, but in some not. For the account of the circle does not contain that of the segments, while that of the syllable does contain that of the phonetic elements. And yet the circle also divides into the segments just as the syllable divides into the phonetic elements.

Further, if the parts are prior to the whole, and the acute angle is part of the right angle and the finger is part of the animal, the acute angle will be prior to the right angle and the finger to the human. But the wholes seem to be prior; for with respect to the account the parts are described in terms of the wholes, which are also prior with respect to being without each other.

Or perhaps something is said to be a part in many ways. Among these, one way is what measures with respect to quantity. But this must be set aside. The things, though, from which the substance is composed as parts—this [way of being a part] must be investigated. If, then, there is the matter, the form, and what is composed of
1035a1 them, and the matter, the form, and what is composed of them are substance, there is a way in which even the matter is said to be a part, and a way in which it is not, but rather parts are the things of which the account of the form is composed—for example, of the concavity flesh is not a part (for this is the matter in which it comes to be), but of the snubness it is a certain part. And of the compound statue the bronze is a part, but of what is said to be a statue as form it is not a part (for each thing must be said to be the form, or the thing insofar as it has the form, but must never be said to be intrinsically the material component).

That is why the account of the circle does not contain that of the segments, while that of the syllable does contain that of the phonetic elements; for the phonetic elements are parts of the account of the form, and are not matter, while the segments are parts in this way, as matter in which the form comes to be—although they are closer to the form[310] than the bronze is to the circle when circularity comes to be in bronze. But there is a way in which not even all phonetic elements will be present

310. *Mete*. 390a4–7.

in the account of the syllable—for example, these here in the wax or the ones [that are movements] in the air; for these too are already part of the syllable as perceptible matter. For even if the line, when divided, passes away into the halves, or the human into the bones, sinews, and flesh, it is not the case that, because of this, they are composed of these as being parts of the substance, but rather as from matter; and of the compound, they are parts, but of the form—that is, what the account is of—they are not parts at all. That is why they are not in the accounts either.

In the account of some things, then, the account of the parts that are such as these will be present, while in that of others it must not be, that is, if it is not of the combination [of the matter and the form]; for that is why some things [come to be] from those [materials] as starting-points into which they pass away, while other things do not.

Things that are combinations of the form and the matter, for example, the snub or the brazen circle, are the ones that pass away into these parts, and a part of them is the matter, while those with which the matter is not combined, but are without matter, and whose accounts are of the form alone, these do not pass away, either at all or not in this way. And so of the combinations these are starting-points and parts, but of the forms they are neither parts nor starting-points. And that is why the statue of clay passes away into clay, the [brazen] sphere into bronze, Callias into flesh and bones, and further, the circle into the segments; for there is a sort of circle that is combined with matter; for something is said to be the circle homonymously, [since the term is applied] both to the one said to be such unconditionally and to the particular one, because there is no name special to the particular ones. **$1035^{b}1$**

The truth has already now been stated, but nonetheless let us take up the issue again and state it yet more perspicuously. For the parts of the account, into which the account is divided, are prior to it—either all or some. But the account of the right angle does not divide into the account of the acute angle, rather, that of the acute divides into the right; for the person defining the acute makes use of the right; for the acute angle is one that is less than the right. The circle and the semicircle behave in the same way; for the semicircle is defined by the circle and so is the finger by the whole; for a finger is such-and-such sort of part of a human. And so those things that are parts as matter, into which a thing divides as into matter, are posterior, while those that are parts as parts of the account and of the substance, the one that is in accord with the account, are prior—either all or some.

Since the soul of animals (for this is substance of the animate) is the substance that is in accord with the account and is the form and the essence of such-and-such sort of body (at any rate, each part, if it is to be defined correctly, will not be defined without its work, which it could not have without perception), it follows that the parts of this are prior, either all or some, to the compound animal, and similarly, then, to each particular animal, while the body and its parts will be posterior, and what is divided into these as into matter is not the substance but the compound. These bodily parts, then, are in a way prior to the compound, but in a way not (for they cannot even

exist when they are separated; for it is not a finger in any and every state that is the finger of an animal; instead, a dead finger is only homonymously a finger). But some of these parts are simultaneous [with the compound]: the ones that are controlling and in which the account and the substance are first found—for example, the heart,[311] perhaps, or the brain; for it makes no difference which of them is of this sort.

The human and the horse, and things that are in this way set over the particulars, that is, [taken] universally, are not substance, but rather a compound of a sort, [consisting] of this account and this matter taken universally. As a particular, though, Socrates is already composed of the ultimate matter,[312] and similarly in the other cases.

A part, then, can be a part either of the form (by "form" I mean the essence), or of the compound that is composed of the form and the matter itself. But only the parts of the form are parts of the account, and the account is of the universal; for the being for circle and circle and the being for soul and soul are the same. But of what is already a compound, such as this circle, that is, one of the particular ones, whether perceptible or intelligible (by "intelligible ones" I mean, for example, the mathematical ones, by "perceptible ones," for example, the brazen or wooden ones)—of these there is no definition, but it is with understanding or perception that they are known, and when they depart from this actuality it is not clear whether they are or are not. But they are always said to *be* and are always known by means of the universal account. But the matter is intrinsically unknowable.[313] Some matter is perceptible, however, while some is intelligible—perceptible matter being, for example, bronze, wood, and any matter that is movable, and intelligible matter[314] being the sort that is in the perceptible things but not insofar as they are perceptible, such as the objects of mathematics.

The way things stand, then, concerning whole and part and concerning the prior and posterior, has now been stated. And it is necessary to say in response, when someone asks whether it is the right angle, the circle, and the animal that are prior or the things into which they are divided and from which they are composed, that it cannot be answered simply. For if even the soul is animal or animate thing, or the soul of each animate thing is this animate thing, and if the circle is being for the circle, and the right angle is being for the right angle (that is, the substance of the right angle), some [whole] should be said to be posterior to some [parts]—for example, to the parts in the account and to the parts of the particular right angle (for both the one with the matter, the brazen right angle, and the one in particular lines are posterior to these). The right angle without matter, by contrast, is posterior to the parts in the account, but prior to the parts in the particular right angle—unconditionally prior to its parts, however, it should not be said to be. But if the soul is a distinct thing and is

311. *GA* 735a14–26.
312. I.e., the matter in which the relevant form is first present.
313. Because form alone is transmitted through perception (*DA* 424a17–20) to understanding (430a7–8).
314. 1037a5, 1045a33–36, 1059b15–16.

not animal, even then some parts must be said to be prior and some must not be said to be prior, as was stated.

7.11
Form and Its Parts

A puzzle arises, which makes perfect sense, as to what sorts of parts are parts of the form and what sorts are not parts of it, but rather of the combination. And yet if this is not clear, it is not possible to define each thing; for the definition is of the universal and of the form. If, then, it is not evident which sorts of parts are parts as matter and which sorts are not, the account of the thing will not be evident either.

In the case of things that manifestly come to be in distinct forms [of matter], as circle does in bronze and stone and wood, it seems clear that these, for example, the bronze or the wood, in no way belong to the substance of the circle, because of its being separate from them. But in the case of things that are not seen being separate, nothing prevents the situation from being similar, just as if all the circles were seen to be of bronze; for nonetheless the bronze would still not belong to the form, but it **1036b1** would be difficult to subtract it in thought. For example, the form of the human is always found in flesh and bones and parts of this sort. Are these, then, also parts of the form and of the account? Or are they not [parts of these], but rather matter—but because the form never comes to be in anything else we cannot separate it?

Since, however, this does seem to be possible, but unclear when, some people already raise the puzzle even in the case of the circle and the triangle, supposing that it is not proper to define these in terms of lines and the continuous, but that all these too are said [of things] in the way flesh and blood are of the human or bronze and stone of the statue. And so they[315] lead everything back to numbers, and say that the account of line is that of the two. And of those who accept the Forms, some say that the dyad is the line-itself, some that it is the Form of the line, for while in some cases the Form and what it is the Form of are the same (for example, the dyad and the Form of the dyad), in the case of the line this is not at all so.

It follows, then, that there is both one Form of many things whose forms are manifestly distinct (which is precisely what followed for the Pythagoreans too), and that it will be possible to make one Form-itself of all things, and make the others not Forms—and yet in this way all things will be one.

It has been stated, then, that there is a puzzle about definitions, and what its cause is. And that is why to lead all things back to Forms in this way and to subtract the matter is superfluous; for presumably some things are this in this, or these things in this state. And the comparison[316] in the case of animal that Socrates the younger used

315. Those (probably Pythagoreans) who define line without reference to matter.
316. Its precise nature is otherwise unknown.

to make is not correct; for it leads away from the truth and makes one suppose that the human can exist without the parts, as the circle can without the bronze. But the case is not similar; for the animal is presumably something capable of perception, and it is not possible to define it without movement, nor, therefore, without the parts being in a certain state. For a hand in any and every state is not a part of the human, but one that is capable of completing its work, and so is animate; but if not animate, it is not a part.

As regards the objects of mathematics, though, why are the accounts of the parts not parts of the accounts, as the semicircles are of the circle? For it is not as if these are perceptible. Or does this make no difference? For there will be matter even of some things that are not perceptible and of everything that is not an essence. The semicircles, then, will not be parts of the universal circle but will be parts of the particular ones, as was said previously;[317] for while there is one sort of matter that is perceptible, there is another that is intelligible.

It is clear too that the soul is primary substance, while the body is matter, and the human or the animal is the thing composed of both taken universally. But Socrates (or Coriscus), if the soul is also Socrates, is twofold (for some regard him as soul, others as the compound). But if he is unconditionally this soul here and this body here, as the universal is, so the particular is too.[318]

Whether there is, beyond the matter of these sorts of substances, another sort of matter, and whether one should look for another sort of substance, such as numbers or something of this sort, must be investigated later on.[319] For it is for the sake of this that we are trying to make some determinations about the perceptible substances, since the theoretical investigation of perceptible substances is in a certain way the work of natural science and secondary philosophy; for it is not only about the matter that the natural scientist must know, but also about the substance that is in accord with the account—even more so.

The way the things in the account are parts in the case of the definitions, and why the definition is an account that is one (for it is clear that the thing is one, but one in virtue of what, given that it certainly has parts), must also be investigated later on.[320]

What the essence is, then, and what way it is intrinsically, has now been stated universally concerning every case, and also why the account of the essence of some things contains the parts of the definiendum, but that of other things does not. And it has been stated that in the account of the substance the parts as matter will not be present—for they are not even parts of that substance, but of the compound one, and of this there is in a way an account and in a way not; for of the compound with the matter there is not an account (for it is indefinite), but with respect to the primary substance there is—for example, of human, the account of the soul; for the substance

317. 1035a1–22.
318. 1035b27–31, 1036a16–25, 1043b2–4.
319. Books 13 and 14.
320. 7.12, 9.6.

is the form present in the thing, from which together with the matter the compound substance is said to be composed—for example, the concavity; for from this and the nose both snub nose and the snubness are composed, for in these the nose will be present twice. But in the compound substance—for example, in snub nose or in Callias—there will be matter present too.

It has also been stated that the essence and the thing are in some cases the same—for example, in the case of the primary substances.[321] By a "primary substance" I mean what is not said to *be* by being one thing in another, that is, in an underlying subject as matter. But things that are [said to *be*] as matter or as combinations with matter are not the same [as their essence], nor are those that are one coincidentally, such as Socrates and the musical (for these are coincidentally the same).

7.12
Definition Again

Let us now speak first—to the extent that it has not already been stated in the *Analytics*[322]—about definition; for the puzzle that was stated there[323] furthers the work of our accounts concerning substance. I mean this puzzle: Why precisely is something one when the account of it is what we call a "definition"?[324] For example, let the account of the human be: the two-footed animal. Why, then, is this one and not instead many—animal and two-footed? For in the case of human and pale they are many when one does not belong to the other, but they are one when it does belong and the underlying subject, the human, has a certain affection (for then one thing comes to be and we have the pale human).

But in the present case one does not participate in the other; for the kind does not seem to participate in the differences (for if it did the same thing would participate in contraries at the same time; for the differences that divide the kind are contraries). But even if it did participate, the argument would be the same, if indeed the differences are many—for example, footed, two-footed, featherless. Why are these one and not instead many? For it is not because these are present [in one kind]; for that way there will be one from all. But surely the things in the definition must be one; for the definition is a certain account that is one and of substance, so that it must be the account of one something; for in fact substance signifies one something and a this something, as we say.[325]

321. $1032^{b}1$–2.
322. *APo*. 2.10, 2.13.
323. *APo.* $92^{a}27$–33.
324. $1030^{a}1$–17.
325. $1003^{a}9$–12, $^{b}32$–33.

One should first investigate definitions that are by division.[326] For there is nothing else in the definition except the kind, which is mentioned first, and the differences; the other kinds are in fact the first one along with the differences combined with it. The first, for example, may be animal, the next two-footed animal, and next again featherless two-footed animal, and similarly if it is said by means of more differences. And, in general, it makes no difference whether it is said by means of many or of few—nor, therefore, whether by means of few or by means of just two. And of the two one is difference and the other kind—for example, in the two-footed animal, animal is kind and the other difference.

If, then, the kind is unconditionally nothing beyond the forms as forms of a kind, or if it is, it is as matter (for the voiced sound is kind and matter, and the differences produce the phonetic elements from this), it is evident that the definition is the account composed of the differences.

But in addition the division should take the difference of the difference—for example, the footed is a difference of animal, and next again one should know the difference of the footed animal insofar as it is footed. So one must not say that of the footed there is, on the one hand, the feathered and, on the other, the featherless, if indeed one is to speak correctly (on the contrary, it is through lack of ability that one will do this), but rather that there is, on the one hand, the cloven-footed and, on the other, the not cloven-footed; for these are differences of foot; for the cloven-footed is a sort of footed. And one should try to proceed always in this way until one reaches the undifferentiated [forms]. At that point there will be precisely as many forms of foot as there are differences, and the footed animals will be equal in number to the differences.[327]

If, then, this is how things stand, it is evident that the ultimate difference will be the substance of the thing and its definition, if indeed one should not state the same thing many times in the definitions; for that would be superfluous. And this is certainly what does happen; for when one says two-footed footed animal one has said nothing other than animal with feet with two feet. And if one divides this too by a proper division, one will be saying the same thing several times over—as many times as there are differences. If, then, one takes a difference of a difference, one difference—the ultimate one—will be the form and the substance. But if one divides coincidentally—for example, if the footed were divided into the pale and the dark—there will be as many differences as there are cuts.

So it is evident that the definition is the account composed of the differences, or, if it is in accord with the correct procedure, the ultimate one. This would be clear if one were to change the order in such definitions—for example, in that of the human, saying two-footed footed animal; for it is superfluous to say footed when two-footed

326. *APr*. 1.31, *APo*. 2.5, 2.13.
327. Cf. *PA* 643ᵇ10–26, *Pol*. 1290ᵇ25–37.

has been said. And there is no order in the substance; for how could one understand one thing as being prior and another posterior?

As regards definitions by division, then, let this much suffice as a first statement of what they are like.

7.13
Are Universals Substances?

Since, however, it is with substance that the investigation is concerned, we should return to that. Just as the underlying subject and the essence are said to be substance, **1038**[b]**1**
so also is the universal. Two of these have already been spoken about, the essence and the underlying subject,[328] saying that it underlies in two ways, either by being a this something, as the animal underlies its affections, or as the matter underlies the actuality.[329] But the universal too seems to some people[330] to be most of all a cause, and the universal most of all a starting-point. Hence let us turn to that too. For it seems impossible for any of the things said [of something] universally to be substance.

For first the substance of each thing is special to it, in that it does not belong to anything else. A universal, by contrast, is something common; for that thing is said to be a universal which naturally belongs to many things. Of which, then, will it be the substance? For it is either the substance of none or of all. And it cannot be the substance of all. But if it is the substance of one, all the others will be this one as well; for things whose substance is one and whose essence is one are also themselves one.

Further, substance is said to be what is not said of an underlying subject, while a universal is always said of a certain underlying subject.

But perhaps the universal, while it cannot be substance in the way in which the essence is, can yet be present in it—for example, as the animal is present in the human and the horse. Clearly there is some account of it. And it makes no difference even if it is not the account of everything in the substance; for this [universal] will not be any less the substance of something, as the human is of the human in whom it is present. So the same result will again follow; for it (for example, the animal) will be the substance of that in which it is present as something special to it.

Further, it is both impossible and absurd for the this (that is, the substance), if it is composed of something, not to be composed of substances or of the this something but of a quality; for then non-substance (that is, the quality) will be prior to substance (that is, to the this). Which is precisely what is impossible; for neither in account nor in time nor in knowledge can the affections be prior to the substance; for then they will also be separable.

328. 7.3 (underlying subject), 7.4–6, 7.10–12 (essence).
329. I.e., the form.
330. Plato and the Platonists.

Further, in Socrates substance will be present, so that [the universal] will be the substance of two things.

And, in general, if the human and whatever is said of things in that way are substance, it follows that none of the things in their account is substance of any of them or is separate from them or in something else. I mean, for example, that there is not some animal, or any other of the things in the account, beyond the particular ones.[331]

If we get our theoretical grasp on the issue on the basis of these considerations, then, it is evident that nothing that belongs universally to things is substance, and that none of the things that are predicated in common signifies a this something but a such-and-such sort. If not, many other difficulties result, and especially the third man.[332]

Further, the issue can also be expressed in this way. For it is impossible for a substance to be composed of substances that are actually present in it; for things that are actually two in this way are never actually one, although if they are potentially two, they can be one (for example, the double line is composed of two half-lines, at any rate, potentially; for their actuality separates them). And so, if the substance is one, it will not be composed of substances present in it and present in the way that Democritus rightly states;[333] for he says that it is impossible for one to be composed of two or two of one; for he makes the indivisible magnitudes the substances. It is clear, therefore, that the same will hold in the case of number, if indeed number is composed of units, as some people[334] say; for two is either not a one, or there is no unit actually present in it.

But this result involves a puzzle. For if no substance whatever can be composed of universals because they signify the such-and-such sort but not this something, and if also no substance can in actuality be composed of substances, every substance would be incomposite, so that there would not even be an account of any substance whatever. But then it seems to everyone, and was stated not long ago,[335] that definition is either of substance only or of it most of all, while now it seems not even to be of it. So there will not be a definition of anything at all. Or else in one way there will be one, but in another way there will not. What is being said will be more clear on the basis of what comes later.[336]

7.14
Are Platonic Forms Separable Substances?

But it is also evident from these very considerations what the consequence is for those who say that the Forms are substances and separable, and at the same time make the

331. I.e., the particular forms.
332. F184, 83.34–85.12.
333. *Cael.* 303a5–8, *GC* 325a34–b5.
334. Perhaps Thales.
335. 1030a2–17.
336. 7.15, 8.6.

Form be composed of the kind and the differences. For if there are the Forms, and if the animal is present in the human and the horse, it is either numerically one and the same in each, or distinct. [I mean the former,] for it is clear that it is one in account; for the person giving the account will go through the same account in either case. If, then, there is some human-itself that is intrinsically a this something and separated, it is also necessary for the things from which it is composed—for example, animal and two-footed—to signify a this something and to be both separable and substances. So the animal too will be like this.

If the animal that is both in the horse and in the human is one and the same, just as you are one and the same as yourself, how will what is present in separate things be one, and why will this animal too not be separate from itself? Next, if it is to participate in two-footed and many-footed, something impossible follows; for contraries will belong to it at the same time, although it is one and a this something. But if it is not to participate in them, what way are they related when one says that the animal is two-footed or footed? Are they perhaps combined and making contact or mixed together? Yet all of these are absurd.

But suppose that the animal is a distinct thing in each, then there will be (one might almost say) an unlimited number of things whose substance is animal; for it is not coincidentally that the human is composed of animal. Further, the animal-itself will be many things; for the animal in each will be substance (for it is not with reference to anything else that it is said to *be*; but if it were, the human will be composed of that other thing, and its kind will be that). And further all the things from which the human is composed will be Forms. But nothing will be the Form of one thing and the substance of another (for that is impossible). Therefore, each of the animals present in the various [forms] of animals will be animal-itself. Further, from what is this latter one composed—that is, how is it composed of animal-itself? Or how can this animal, whose substance is this itself, be beyond the animal-itself?

Further, in the case of the perceptibles, these and even more absurd results follow. If, then, it is impossible for things to hold in this way, it is clear that there cannot be Forms of these in the way that some people say.

7.15
No Definitions or Demonstrations of What Is Particular

Since substance is in distinct ways, both as the compound and as the account (I mean that the first is substance in this way, the account combined with the matter, while the other is wholly the account), it follows that of those said to be such in the first way there is passing away (for there is coming to be as well), but there is none—in the sense of being in the process of passing away—of the account (for there is no coming to be either, for the being for house does not come to be, but the being for

this house); rather, without coming to be or passing away, they are or are not; for it has been proved[337] that no one begets or makes these.

This is also why there is neither definition nor demonstration of the substances that are perceptible and particular, because they have matter, the nature of which is such that it is capable of both being and not being (which is why all the particular ones of them can pass away). At all events, if demonstration is of the necessary things and definition is a matter of scientific knowledge, and if, just as scientific knowledge cannot be scientific knowledge at one time and ignorance at another[338] (but instead it is belief that is like that), so neither definition nor demonstration can be that way either (but instead it is belief that is of what admits of being otherwise), it is clear that there will not be either definition or demonstration of such things. For things that pass away are unclear to those who have scientific knowledge, when they have departed from perception, and, though accounts are preserved the same in their soul, there will still not be either definition or demonstration. That is why, in issues relating to definition, when someone is defining one of the particular things, we must not be ignorant of the fact that it is always possible to do away with this definition; for particulars cannot be defined.

Nor indeed can any Form be defined. For the Form is a particular, so they say, and separable.[339] But its account must be composed of names, and the definer cannot make up a name (for it would be an unknown). Yet each of the established names is common to all. Therefore, they must belong to something else too—for example, if someone were defining you, he would say that you are an animal that is thin or pale or something else that will also belong to something other than you. And if someone were to say that nothing prevents all these taken separately from belonging to many things, but that taken all at once they belong only to this one, one must say first they also belong to both components—for example, the two-footed animal belongs to animal and to two-footed.[340] In fact, in the case of the eternal things this is even necessary, because the components are prior to and parts of the composite. More than that, they are also separable, if indeed the human is separable; for either neither is separable or both are. But if neither is, the kind will not exist beyond the forms, and if it does, so will the differences. Second, they [animal, two-footed] are prior in being [to the two-footed animal]. But things that are prior to others are not done away with together with them. Again, if the Forms are composed of Forms (for the things they are composed of are less composite), it will further be necessary for the things from which the Form is composed—for example, animal and two-footed—to be predicated of many things. If not, how will they come to be known? For there will then be a Form that cannot be predicated of more than one thing. But that does not seem to be the case. On the contrary, every Form seems to admit of being participated in.

337. 7.8.
338. Cf. *APo.* 75b24–26.
339. 1078b30–32, 1086b7–11.
340. 1003a10–12.

As was said, then, the impossibility of defining [particulars] escapes notice in the case of eternal things, especially those that are unique—for example, the sun and the moon. For people err by adding the sort of things whose removal would leave it still being the sun, such as "going around the earth" or "being hidden at night" (for [this would entail] that if it stood still or was visible at night, it would no longer be the sun). But if it were not, that would be absurd (for the sun signifies a certain substance). Further, [they err not only in that way but also by mentioning] things that can belong to something else—for example, such that if a second thing of the relevant sort comes to be, it is clear that it will be a sun; therefore, the account is common to both. But the sun was supposed to be a particular, just like Cleon or Socrates. After **$1040^{b}1$** all, why is it that none of these [who believe in] Forms put forward a definition of them? For it would become clear, if they tried, that what has now been said is true.

7.16
Most Things That Seem to Be Substances Are in Fact Capacities

It is evident that even of the things that seem to be substances, most are capacities, whether the parts of animals (for none of them exists when it has been separated, and whenever they are separated they all exist only as matter) or earth, fire, and air (for none of them is one, but instead they are like a heap, until they are concocted[341] and some one thing comes to be from them).

One might most readily suppose, however, that the parts of animate things, and the parts of the soul close to them, turn out to exist in both ways, both actually and potentially, due to having starting-points of movement deriving from something in their joints—which is why some animals go on living when divided.[342] Nonetheless, when they are one and continuous by nature, rather than by force or by growing together, these will all exist potentially; for the latter sort of thing is a deformation.

But since something is said in the same ways to be one and to *be*, and the substance of what is one is one, and things whose substance is one in number are one in number, it is evident that neither one nor being can be the substance of things, just as neither being for an element nor being for a starting-point can. Rather, we look for what the starting-point of something is in order to lead the thing back to something better known. Of these, then, being and one are in fact substance to a higher degree than are starting-point, element, or cause. But not even they are substance, if indeed nothing else—nothing that is common—is either; for the substance belongs to nothing but itself and what has it, of which it is the substance. Further, what is one cannot be in many places at the same time, but what is common does belong in many places at once, so that it is clear that no universal exists separately, beyond the particulars.

341. *Mete*. $379^{b}18$–35.
342. *DA* $411^{b}19$–24, $413^{b}13$–24.

But those who accept the Forms speak correctly in one way, in separating them (if indeed the Forms are substances), but in another way not correctly, because they say that the one over many is a Form. And the cause of this is that they do not have [an account] to give of the substances that are of this sort—the imperishable ones that are beyond the particular perceptible ones. So they make them the same in form as perishable things (for these are the ones we know), man-itself and horse-itself, adding to the perceptible ones the word "itself." And yet even if we had never seen the stars they would nonetheless, I think, have been eternal substances beyond the ones we knew, so that even as things stand, if we do not grasp which ones they are, at any rate, it is presumably just as necessary that there be some.

That nothing said of things universally is substance, then, and that no substance is composed of substances, is clear.

7.17
Substance as Starting-Point and Cause

Let us make, as it were, a fresh start, and say again what, and what sort of thing, substance must be said to be; for perhaps on the basis of these considerations that substance, whatever it is, which is separated from the perceptible substances will also be clear. Since, then, substance is a starting-point and cause, one must go in search of it from there.

The why is always inquired about in this way: Why does one thing belong to a certain other? For to inquire about why the musical human is a musical human is either, as was said, to inquire about why the human is musical, or [why it is] something else. But to inquire about why a thing is itself is to inquire about nothing (for that something is the case and that it exists should [already] be clear[343]—I mean, for example, that the moon is eclipsed). But of the fact that a thing is itself there is one account and one cause in all cases, [as in] why the human is human or the musical is musical. Unless someone were to say that it is because each thing is indivisible from itself, and this is what it is for it to be one. But that, at any rate, is common to all cases and too concise.[344] One can, though, inquire about why the human is an animal of such-and-such sort. It is clear, therefore, that this is not to inquire about why he, who is a human, is a human.

It is when something is [predicated] of something, therefore, that one inquires about why it belongs to that thing (but that it does belong must be clear; for if things are not that way, there is nothing to inquire about). For example, "Why does it thunder?" is "Why is there noise in the clouds?" For this way what is being inquired about is one thing [predicated] of another. And why are these—for example, brick

343. *APo*. 93a26–27.
344. *Rh*. 1414a24–25.

and stones—a house? It is evident, therefore, that one is inquiring about the cause. This (one might almost say) logico-linguistically is the essence. But in some cases it is what the thing is for the sake of (for example, it is presumably this in the case of a house or a bed), and in some it is what first initiated the movement; for this is also a cause. But the latter is inquired about in cases of something's coming to be and passing away, while the former is inquired about also in the case of a thing's being.

What is being inquired about most easily escapes notice, however, in cases where one thing is not said of another. For example, human being, when what it is is being inquired about, it escapes notice, because it is said simply, and one does not declare **1041**^{b}**1** that these things are this. But we must divide up before inquiring. Otherwise, inquiring about nothing and inquiring about something will become joint inquiries. But since the existence [of the subject] and also the belonging [of the predicate to it] must be the case, it is clear, then, that what is being inquired about is why the matter is something. For example, why are these things a house? Because the being for house belongs to them. Why is this—or rather this body in this state—a human being? So what is being looked for is the cause in virtue of which the matter is something. But this is the substance.

It is evident, therefore, that in the case of things [said] simply there is neither inquiry nor teaching, but instead another way than inquiry belongs to them.[345]

What is composed of something in such a way that the totality is one is not like a heap but like a syllable. But the syllable is not its phonetic elements (BA is not the same as B and A), nor is flesh the same as fire and earth; for when they—for example, the flesh and the syllable—are dissolved they no longer exist, while the phonetic elements do exist, and so do the fire and the earth. Therefore, the syllable is not only its phonetic elements (the voiced [= A] and the unvoiced [= B]), but also something else. And the flesh is not only fire and earth, or the hot and the cold, but also something else. Therefore, if that thing must be either an element or composed of elements, then, if it is an element, the same argument will apply again. For the flesh will be composed of this and fire and earth, and something else again, so that the process will go on without limit. But if it is composed of an element, it is clear that it must be not composed only of one but of more than one, or else that one will be the thing itself, so that again in this case we can state the same argument as in the case of the flesh and syllable. But it would seem to be something, and not an element, and a cause in fact of this being flesh and this being a syllable. And similarly in the other cases. This is the substance of each thing; for it is the primary cause of their being.

Since, while some things are not substances, all the ones that are substances are composed in accord with nature and by nature, this nature would seem to be their substance, which is not an element but a starting-point. An element, by contrast, is what a thing can be divided into and which is present in it as matter—like the A and the B of the syllable.

345. 1051^{b}17–1052^{a}4.

BOOK 8 (ETA)

8.1
Summary of Book 7

1042ᵃ1 After having recapitulated what has been said, then, and having concluded the main point, we must add an end.

It was said,[346] then, that the inquiry is into the causes, starting-points, and elements of substances. And, as for substances, some are agreed on by all, while others have been advocated by certain people on their own behalf. The agreed-on ones are the natural ones—for example, fire, earth, water, air, and the other simple bodies, then plants and their parts, the animals and the parts of the animals, and finally the heaven and the parts of the heaven—while some people say[347] on their own behalf that the Forms and the objects of mathematics are substances. But it follows from the arguments that there are other[348] substances: the essence and the underlying subject. Further, in another way the kind is more substance than the various forms, and the universal than the particulars. And with the universal and the kind the Forms are closely connected (for it is in accord with the same argument that they seem to be substances). And since the essence is substance, and a definition is an account of the essence, that is why definition and what is intrinsic were discussed. And since the definition is an account, and the account has parts, it was also necessary to see in the case of a part what sorts are parts of the substance and what sorts are not, and whether these are parts of the definition too. Further, neither the universal nor the kind is substance. And as for the Forms and the objects of mathematics, they must be investigated later on;[349] for some say that these are substances that are beyond the perceptible ones.

But now we should review the agreed-on substances. These are the perceptible ones. And the perceptible substances all have matter. The underlying subject is substance, and in one way this is the matter (by "the matter" I mean what, though not actively a this something, is potentially a this something); in another way, it is the account and the shape, which being a this something is separable in account; and in a third way, what is composed of them, of which alone there is coming to be and passing away, and which is unconditionally separable; for of substances that are in accord with the account some are separable and some are not.[350]

But that matter too is substance is clear; for in all changes from one opposite to another there is something that underlies the changes. For example, in change in

346. 982ᵃ1–6, 1025ᵇ3–7, 7.17.
347. 7.2.
348. Reading ἄλλας.
349. Books 13 and 14.
350. 1017ᵇ24–26, 1035ᵇ14–31, 1037ᵃ5–10.

place, there is what is now here and later on there; in change in growth, there is what is now one size and later on larger or smaller; in change involving alteration, there is what is now healthy and then again sick; and similarly in change in substance, there is what is now coming into being and later passing away, and now is underlying **1042**^{b}**1** subject as a this something and then again as being so as a privation. The other sorts of changes follow along, then, with this sort, but this one does not follow along with either one or both of the others; for if a thing has matter for change of place, it is not necessary that it also have it for coming to be and passing away.

What the difference is between unconditional coming be and coming to be that is not unconditional has been stated in our studies concerning nature.[351]

8.2
Substance as Activation of Perceptibles

Since substance as underlying subject and as matter is generally agreed on, and this is what is potentially [something], it remains to say what substance—as activation—of the perceptibles is.

Democritus,[352] for his part, seems to think that there were three differences; for he thinks that the underlying body and the matter are one and the same, but that it is differentiated either by rhythm (that is, shape), or by turning (that is, position), or by contact (that is, order). It is evident, however, that there are many differences. Some things are said to *be*, for example, due to the mode of composition of their matter, like those said to *be* due to blending (such as honey-water), or due to tying (such as a bundle), or due to gluing (such as a book), or due to nailing (such as a box), others due to more than one of these. Others are said to *be* due to position—for example, a threshold or a lintel (for these differ due to how they are placed); others due to time (such as dinner and breakfast); others due to place (such as the winds); and others due to the affections [special] to perceptibles (such as hardness and softness, density and rarity, dryness and wetness), some due to some of these, others due to all—and in general, some due to excess, some to deficiency.

So it is clear that something is said to *be* in that many ways too; for a threshold *is* because it is placed thusly, and the being for a threshold signifies its being placed thusly, and the being for ice signifies its being solidified thusly. And in some cases their being will even be defined by all of these, due to some parts being mixed, some blended, some bound, some solidified, and some making use of the other differences, as do hand and foot.[353]

It is necessary, then, to get hold of the kinds of differences (for these are going to be starting-points of the being)—for example, those differentiated by the more and

351. *Ph.* 225^{a}13–20.
352. 985^{b}4–10.
353. *HA* 486^{a}14–^{b}22.

less, or by dense and rare, or by others of this sort; for all these are excess and deficiency. And if something is differentiated by shape, or by smoothness and roughness,[354] all these are differentiated by straight and curved. And for other things being is being mixed and not being is the opposite. From these cases, then, it is evident—if indeed the substance is the cause of each one's being—that it is in these differences that one must look for what the cause is of the being of each of them.

None of these differences is substance, not even when it is coupled [with matter]; nonetheless, in each case it is the analog. And just as in substances what is predicated of the matter is the activation itself, so in the other definitions too it is what is most of all this. For example, if one had to define a threshold, one would say wood or stone placed this way; and a house, bricks and timbers placed this way (or, again, in some cases the for-the-sake-of-which is included too); and if ice, water frozen or solidified this way; and concord, high and low mixed such-and-such a way. And it is the same in the other cases. It is evident from these things, then, that the activation of one matter is different from that of another, and so is the account; for of some things, it is the mode of composition, of others the mixing, and of others some other of the things mentioned. That is why of those who give definitions, the ones who in saying what a house is say that it is stone, bricks, and timbers are speaking of what is potentially a house, for these things are matter. Those who propose[355] that it is a receptacle to shelter property and bodies, or something else of this sort, are speaking of the house in activation.[356] But those who combine both of these speak of the third sort of substance, the one composed of them (for it seems that the account given in terms of the differences[357] is of the form and the activation, while the one that is composed of the constituents is an account of the matter instead). And similarly for the sorts of definitions that Archytas used to accept; for they are of both combined. For example, what is stillness? Quietness in a large quantity of air. The air is matter; the quietness is activation and substance. What is a calm? Smoothness of sea.[358] The underlying subject as matter is the sea; the activation and the shape is the smoothness.

It is evident, then, from what has been said, what perceptible substance is, and the way it is; for there is one as matter, one as shape and activation, and one composed of these.

8.3
Composite Substances versus Their Activations

But one should not be ignorant of the fact that sometimes it escapes notice whether the name signifies the composite substance or the activation and the shape—for

354. *Cat.* 10a22–24.
355. Reading προτιθέντες.
356. Reading ἐνεργείᾳ.
357. 1038a18–28.
358. *Top.* 108b23–26.

example, whether house is a sign for the joint thing, because it is a covering composed of bricks and stones placed this way, or for the activation and the form, because it is a covering, or whether a line is a two in length or a two, or whether an animal is a soul in a body or a soul; for soul is substance and activation of a certain sort of body.[359] Animal might in fact be applied to both, not as something said in one account, but rather with reference to one thing. But though this makes a difference in relation to another issue, in relation to our inquiry into perceptible substance it makes none; for the essence belongs to the form and the activation. For a soul and being for a soul are **1043^{b}1** the same, but being for a human and a human are not the same, unless the soul too is also going to be said to be a human—in which case, in one way they are the same, in another way not.

It is evident, then, to those who investigate it, that the syllable is not composed of the phonetic elements plus a mode of composition, nor is the house bricks plus a mode of composition. And this is correct; for neither the mode of composition nor the mixing is composed of the things of which it is a composition or a mixing. And similarly in the other cases. For example, if the threshold is such by position, the position is not composed of the threshold, but rather the latter of the former. Nor indeed is the human the animal plus two-footed, but there must be something else beyond these, if these are matter—something that is neither an element nor composed of elements, but is rather the substance. And it is once people do away with this that they state only the matter. If, then, this is cause of the being, and if this is substance, they will not be stating[360] the substance itself.

(This substance, then, must either be eternal or it must be capable of passing away without being in the process of passing away, and must have come to be without [ever] being in the process of coming to be. And it has been proved and made clear elsewhere[361] that no one makes or begets the form, but instead it is a this that is made, and the thing composed of [matter and form that] comes to be. As to whether the substances of things that can pass away are separable, nothing is yet clear—except that it is clear that it is impossible in some cases, those where it is impossible for them to be beyond the particular instances, like a house or a tool. Perhaps, then, neither these nor any of the other things that are not composed by nature are substances at all; for one might assume that the nature is the only substance found in things that can pass away.)

So the puzzle that the followers of Antisthenes[362] and similarly uneducated people used to puzzle over has a certain timeliness, namely, that it is impossible to define the what-it-is (for a definition is a "long story"), although it is actually possible to teach people what sort of thing it is.[363] For example, silver—what it is one cannot say, but

359. *DA* 412^{a}19–28.
360. Reading οὐ λέγοιεν.
361. 7.8.
362. 1024^{b}32.
363. Rejecting the seclusion of καὶ and the addition of ὁρίσασθαι δ'οὔ.

that it is like tin, one can say. So of one sort of substance there can be a definition and an account, the compound sort, whether perceptible or intelligible, but of the primary parts of which this is composed, there cannot be any, if indeed the definitional account signifies something [predicated] of something, and one must play the part of matter and the other of shape.

It is also evident why, if indeed substances are in a way numbers, they are so in this way and not, as some people say, as numbers of units; for a definition is a sort of number; for it is divisible, and indeed into indivisibles (for accounts are not unlimited), and number is like that. And just as when one of the parts of which a number is composed is subtracted from or added to the number, it is no longer the same number but a different one, even if it is the very smallest part that has been subtracted or added, so too neither the definition nor the essence will any longer be the same if anything is subtracted or added. And in fact the number must be what makes something one, though they cannot now say what makes it one, if indeed it is one (for either it is not one, but rather a sort of heap, or if indeed it is one, one must say what it is that makes it one from many). The definition is also one, but they likewise cannot say what makes it one either. And this result makes perfect sense; for the argument is the same [in both cases].

The substance is also one in this way, and not—as some say—by being a sort of unit or point, but rather each is an actuality and a sort of nature. And just as number does not admit of the more and less, neither does the substance that is in accord with the form, but if indeed any does it is the one with the matter.

Concerning the coming to be and passing away of what are said to be substances, then, and in what way it is possible and in what way not, and concerning the leading back of things to numbers, let this much be determined.

8.4
The Matter of Composite Substances

As regards material substance, one should not overlook the fact that even if all things come from the same primary thing or from the same things as primary, and even if the same matter serves as starting-point for the things that come to be, nonetheless there is a sort that properly belongs to each—for example, to phlegm, it is the sweets and the fats; to bile, it is the bitter or some other things. But perhaps these come from the same thing. And there come to be several matters for the same thing when the one is matter for the other—for example, phlegm comes from the fat and the sweet if the fat comes from the sweet. But it comes from bile by the analysis of the bile into its primary matter. For one thing can come from another in two ways, either because it will be found further down the road or because it will be found if the other is analyzed to its starting-point.

It is possible for things, though their matter is the same, to come to be different because of the moving cause—for example, both a box and a bed can be made of wood. But of some things, because they are different, the matter is of necessity different—for example, a saw could not come to be of wood, nor can the moving cause bring this about; for it could not make a saw of wool or wood. Therefore, if indeed the same thing can be made of different matter, it is clear that the craft—that is, the starting-point, the mover—must be the same; for if both the matter and the mover are different, so is the thing that comes to be.

When one is inquiring about the cause, then, one should—since things are said to be causes in many ways—state all the possible causes. For example, of a human, what is the cause as matter? The menses? What is it as mover? The seed? What is it as the form? The essence. What is it as the for-the-sake-of-which? The end. Perhaps, though, these last two are the same.[364] But it is the closest causes that should be stated. For example, what is the matter? Not fire or earth but the one that is special.

As regards substances that are natural and that come to be, then, it is necessary to proceed in this way if one is to proceed correctly—if indeed the causes are these and this many, and it is the causes that one needs to know. But in the case of the natural but eternal substances another account is needed. For perhaps some have no matter, or not matter of this sort but only matter for movement with respect to place. Nor is there matter for those things that are indeed by nature but are not substances, where instead the substance is the underlying subject. For example, what is the cause of an eclipse? What is its matter? In fact, there is none. Instead, the moon is what suffers [the eclipse]. And what is the cause as moving and extinguishing the light? The earth. As for the for-the-sake-of-which, perhaps there is not one. And the cause as form is the account. But this is unclear unless it involves the [moving] cause. For example, what is an eclipse? Lack of light. But if one adds "as a result of the earth coming in between," then this is the account that involves the cause.[365]

In the case of sleep,[366] however, it is not clear what the primary thing is that is affected. Is it the animal? Yes, but the animal with respect to what, and to what primary thing? The heart or something else. Then, as a result of what? Then, what is the affection (that of the primary thing, not of the whole)? Such-and-such sort of immobility? Yes, but to what affection of the primary thing is this due?

8.5
How the Matter of a Thing Is Related to Its Contrary States

Since some things are and are not without coming to be or passing away—for example, points, if indeed they *are*, and in general, the forms (for it is not the pale that

364. *Ph.* 198^{a}25–27.
365. *APo*. 93^{a}28–^{b}7.
366. *Somn*. 456^{b}17–28.

comes to be but the wood that comes to be pale, if everything that comes to be comes to be from something and comes to be something), not all contraries could come to be from each other, but rather a pale human comes from a dark human, and pale from dark, in different ways. Nor does everything have matter, but only those things that come to be and change into one another. But those that are or are not without such changing have no matter.

There is a puzzle about how the matter of a given thing is related to its contrary states—for example, if the body is potentially healthy, and disease is contrary to health, is the body both potentially healthy and potentially diseased? And is the water potentially wine and potentially vinegar? Or is it rather the matter of one in virtue of its state and its form, and of the other in virtue of the privation and the passing away of its state and form contrary to nature?

There is also a certain puzzle as to why the wine is neither matter of the vinegar nor potentially vinegar, and yet vinegar comes to be from it, and why the living being is not potentially a corpse. Or is it not rather that these passings away are coincidental? And it is the matter of the live animal that is, in virtue of its passing away, itself a potential corpse and matter of a corpse, and the water of vinegar; for they come to be from these just as night does from day. And things that change into one another in this way, then, must revert to their matter—for example, if a live animal were to come to be from a corpse, the corpse would have to first revert to its matter, and then in this way become an animal, and the vinegar would have to revert to water and then in this way become wine.

8.6
What Makes a Definiens or a Definiendum One

Let us now consider the puzzle stated previously about definitions and about numbers: What is the cause of their being one? For of all things that have several parts and where the totality of them is not like a heap, but the whole is something beyond the parts, there is some cause of it, since even among bodies, in some cases contact is the cause of their being one, in others stickiness, or some other affection of this sort. A definition, however, is an account that is one not by conjunction, like the *Iliad*, but by being of one thing. What is it, then, that makes the human one, and why one and not many—for example, both animal and two-footed? Especially, of course, if, as some people say, there is some animal-itself and some two-footed-itself? For why are those things-themselves not the human (so that humans would be [what they are] by participation not in human, nor in one thing, but in two, animal and two-footed, and in general, then, the human would be not one but more than one, animal and two-footed)?

It is evident, then, that if people proceed in this way—as they usually do—to define and speak, it is not possible to give an answer and solve the puzzle. But if,

as we say, there is, on the one hand, matter and, on the other, shape, and the one is potentially and the other actively, what is being inquired about will no longer seem to be a puzzle. For this puzzle is the same as would arise if the definition of cloak were round bronze; for then this name would be a sign of the account, so that the subject of inquiry is what is the cause of the round and the bronze being one? There no longer appears to be a puzzle, then, because the one is matter, the other shape. So what is the cause of this—of what is potentially being so actually—beyond what produces it (in the case of things where there is a process of coming to be)? For there is no other cause of what is potentially a sphere being actively a sphere; rather, this was the essence for both of them.

Of matter, there is some that is intelligible and some that is perceptible, and one part of the account is always the matter and the other the activation—for example, the circle is shape plus plane. But each thing that has no matter, whether intelligible or perceptible, is from the outset precisely what is a one, just as it is also from the outset precisely what is a being—a this, a quality, a quantity. That is also **1045^{b}1** why neither being nor one is present in their definitions. Also, the essence is from the outset a one, just as it is from the outset a being. And that is why there is no other thing that is the cause in the case of any of these things either of their being one or of their being; for each of them is from the outset a being and a one, and not because they are in being-kind and one-kind, nor as separable beings beyond the particulars.

It is because of this very puzzle, however, that some people speak of participation and puzzle over what the cause of participation is and what it is to participate. Others, however, speak of communion, as Lycophron says that scientific knowledge is a communion between scientifically knowing and soul, while others say that living is a composition, or conjunction, of soul with body. And yet the same account applies to all cases; for something's being healthy will also be either a communion, a conjunction, or a composition of soul and health, and the bronze's being a triangle will be a composition of bronze and triangle, and something's being pale will be a composition of surface and paleness. The cause of this is that they look for an account of potentialities and actualities that makes them one, and for a difference [between them].

But in fact, as was said,[367] the ultimate matter and the shape are one and the same, the one potentially, the other actively, so that it is the same thing to look for what is the cause of oneness and what is the cause of being one; for each thing is a one, and what potentially is and what actively is are in a way one. So there is no other cause here, unless there is something that brought about the movement from potentiality to activity. But things that have no matter are all unconditionally precisely what is a one.

367. 1045^{a}23–33.

BOOK 9 (THETA)

9.1
Potential Being (Capacities)

Primary being, then, that to which all other categories of being are referred back, has been spoken about, namely, substance (for it is in accord with the account of the substance that the others are said to *be*—that is, quality, quantity, and the others that are said to *be* in this way; for they will all include the account of the substance, as we said in the first discussions[368]). But since something is said to *be*, on the one hand, by being a what or a quality or a quantity, and, on the other, with respect to potentiality and actuality and in accord with the work,[369] let us also make some determinations about potentiality and actuality—and first about what is said to be a potentiality in the strictest sense, even though it is not the most useful for what we wish to investigate now;[370] for potentiality and activity extend more widely than those cases that are said to be such only with reference to movement. When we have spoken about it,[371] we will, in the determinations we make concerning activity,[372] also make clear the others.

We determined in another discussion[373] that something is said to be a capacity and to be capable in many ways. Among these, the ones that are said to be capacities homonymously may be left aside (for some are said to be such because of some similarity, as in geometry[374] we say that things are powers or non-powers because of being or not being in some way). But those that are said to be capacities in relation to the same form are all starting-points, and are said to be capacities with reference to one that is primary, which is a starting-point of change in another thing or in itself insofar as it is other.[375] For one sort is a capacity to be affected, the starting-point in the thing itself of being affectively changed by another thing or by itself insofar as it is other. Another sort is the state of being unaffectable (leading to the worse and to passing away) by another thing, or by itself insofar as it is other, in virtue of a starting-point of change. For present in all these definitions is the account of the primary capacity. Again, things are said to have these capacities merely because of acting or being affected or because of acting or being affected well, so that even in the accounts of the latter the accounts of the former capacities are in a way present.

368. 1003b16–19, 1028a10–20, 1029a12–16, 1030a28–b7.
369. 1050a21–23.
370. I.e., whether there is any substance that is separate. See 1028b30.
371. 9.1–5.
372. 1048a27–b6.
373. 5.12.
374. 1019b33–34.
375. *Ph.* 192b21–27.

It is evident, then, that in a way the capacity to act and to be affected are one (for something is capable either by itself having a capacity to be affected or by another thing having the capacity to be affected by it), while in another way they are distinct. For the one capacity is in what is affected (for it is because it has in it a certain starting-point, and because the matter too is a certain starting-point, that what is affected is affected, and that one thing is affected by another; for what is oily is burnable, what yields in this specific way is crushable, and similarly in the other cases), while the other capacity is in what acts—for example, heat or the craft of building (the one in what is capable of heating, the other in what is capable of building). That is why, insofar as it is naturally unified, nothing is affected by itself; for it is one, and not other.

And incapacity and being incapable are the privation that is contrary to this sort of capacity, so that every capacity is for the same thing and in the same respect as the corresponding incapacity. But something is said to be a privation in many ways; for there is what does not have something and what is naturally suited to have something but does not have it, either at all or when it is natural to have it, and either in this specific way (for example, completely) or even in any way whatever. In some cases, though, where things that are naturally suited to have something do not have it due to force, we say that they have been caused to be deprived of it.

9.2
Rational and Non-rational Capacities

Since some starting-points of these sorts are present in inanimate things, others in animate ones, and in a soul, and in the part of the soul that has reason, it is clear that some of the capacities will be non-rational, while some will involve reason. That is why all the crafts—that is, all the productive sciences—are capacities; for they are starting-points of change in another thing or in the same thing insofar as it is other.

And all the capacities that involve reason are such that the very same one is a capacity for contraries, while the non-rational ones are such that one capacity is for one of them—for example, the hot is for heating only, but the craft of medicine is for both disease and health.[376]

The cause of this is that scientific knowledge is an account, and the same account makes clear both the positive thing and its privation, except not in the same way—that is, in a way it is of both, but in a way it is rather of the positive thing. And so it is also necessary that these sorts of sciences should be of contraries, but of one intrinsically and of the other non-intrinsically; for the account too is of one intrinsically and of the other, in a way, coincidentally; for it is by negation and removal that it makes

376. 1048^{a}10–15.

the contrary clear; for the contrary is the primary privation, and this is the removal of the other [and positive] contrary.

Since contraries do not occur in the same thing, and scientific knowledge is a capacity by having an account, and the soul has a starting-point of movement, it follows that while what is healthy produces only health, and what is capable of heating produces only heat, and what is capable of cooling produces only cold, the person with scientific knowledge can produce both of the relevant contraries. For the account is of both, though not in the same way, and it is in a soul that has a starting-point of movement, so that the soul will move both of the relevant contraries from the same starting-point, having connected them to the same account. That is why things that are capable in accord with an account—in contradistinction to the ones capable without an account—produce contraries; for they are encompassed by one starting-point, the account.

It is also evident that while the capacity merely to act or to be affected follows along with the capacity to do so well, the latter does not always follow along with the former; for someone who does something well must of necessity also do it, but someone who merely does something need not of necessity also do it well.

9.3
The Megarians on Capacities

There are some people—for example, the Megarians—who say that a thing is capable of something only when actively doing it, and that when not actively doing it, it is not capable—for example, someone who is not building is not capable of building, but someone who is building is capable if and when he is building, and similarly in the other cases. But that the consequences of this are absurd is not difficult to see. For it is clear that someone will not even be a builder unless he is building (for to be a builder is to be capable of building), and similarly in the case of the other crafts. So if it is impossible to possess such crafts without at some time having learned and grasped them, and impossible not to possess them without having at some time lost them—either by forgetting them or by being affected in some way or due to time (for of course it cannot be due to the passing away of the thing;[377] for it always is)—then whenever someone has stopped [building], he will not possess the craft. And if he will at once start building again, how will he have [re-]grasped it?

Inanimate things too are the same way; for there will be no cold or hot or sweet or, in general, anything perceptible, if nothing is perceiving them, so that the supporters of this view will have to give the argument of Protagoras.[378] But in fact nothing will even have perception if it is not perceiving and actively so. If, then, something is

377. I.e., the object of scientific knowledge, which, as a universal, cannot pass away.
378. 1009a6–16.

blind if it does not have sight (though it is natural that it should have it) when it should naturally have it, and further, in the way it should naturally have it, the same people will be blind many times in the day—and deaf too.

Further, if what is lacking capacity is incapable, what is not happening will be incapable of happening. But someone who says of what is incapable of happening that it either is or will be says something false (for this is what incapable signified). So these arguments do away with both movement and coming to be. For what is standing will always be standing and what is sitting will always be sitting; for if it is sitting it will not get up; for what does not have the capacity to get up is incapable of getting up. So if one cannot say these things, it is evident that capacity and activity are distinct. (For those arguments make capacity and activity the same, which is why it is no small thing that they are looking to do away with.) So it is possible for something to be capable of being and yet not be, or capable of not being and yet be, and similarly for the other categories—to be capable of walking and yet not walk, and to be capable of not walking and yet walk. A given thing is capable if nothing impossible follows from the assumption that the activity it is said to have the capacity for belongs to it. I mean, for example, if a thing is capable of sitting and it is possible for it to sit, if sitting should belong to it, there will be nothing impossible occurring. And similarly if it is capable of being moved or moving, of standing or making something stand, of being or coming to be, or of not being or not coming to be.

The name "activity," which is connected to actuality, has been extended to other things from applying most of all to movements; for activity seems most of all to be movement, which is why people do not assign movement to non-beings, although certain other predicates they do—for example, non-beings are objects of thought and of appetite, but are not moving, and that is because, if they were, while not actively being, they would actively be. For among non-beings, some are potentially, although they are not, because they actually are not. **$1047^{b}1$**

9.4
Capacities and Incapacities

If, as was said,[379] something is capable insofar as an impossibility does not follow,[380] it is evident that it cannot be true to say that a given thing is capable of being but will not be, so that one thereby escapes the conclusion that there are impossible things. I mean, for example, suppose someone—someone who is not rationally calculating that it is incapable of being so—were to say that the diagonal of the square is capable of being measured, although it will not be measured, on the grounds that nothing prevents something from being capable of being or of coming to be that neither is nor is going to

379. $1047^{a}24–26$.
380. Reading ᾧ ἀδύνατον μὴ ἀκολουθεῖ.

be. But, on the basis of the things proposed, what is necessary is this, that if we were to assume something to be or to have come to be that is not, but that is capable of being, there will be nothing impossible in this; but it *will* turn out that there is something impossible; for the diagonal is incapable of being measured. For what is false and what is impossible are certainly not the same; for that you are standing now is false, but not impossible.

At the same time, however, it is also clear that if when A is the case it is necessary that B is the case, if A is possible, it is necessary that B is possible too; for suppose it is not necessary that it is possible, then nothing prevents it from being impossible. So, let A be possible. Then, when A is possible, if A is posited as being the case, nothing impossible follows, and so of course it is also necessary for B to be the case. But B was supposed to be impossible. Let it be impossible, then. If, then, A is impossible, it is necessary that B is too.[381] But the first was supposed to be possible,[382] therefore so is the second. Therefore, if A is possible, B will also be possible—if indeed they are so related that if A is, then B must be. If, then, when A and B are related in this way, B is not possible in the specified way, A and B will not be related as posited either. And if when A is possible it is necessary that B is possible, then if A is the case, it is also necessary that B is the case. For that B is of necessity possible if A is possible signifies this, that if ever A were the case, both when and in the way that it was supposed to be possible for it to be, then it is necessary for B to be the case at that time and in that way too.

9.5
Capacities and Their Acquisition; Rational Capacities

As all capacities are either innate, like the perceptual modalities, or come by habit, like that of pipe playing, or by learning, like that of the crafts, in the case of some of them prior activation is necessary for their possession, namely, those that come by habit or by reason, but for those that are not of this sort, or those dealing with being affected, this is not necessary.

Since what is capable is capable of something, at some time, in some way (and **1048a1** however many other things must be present in the definition), and since some things are capable of producing movement in accord with reason and their capacities involve reason, while others are non-rational and their capacities non-rational, and the rational capacities must be in an animate thing, while the non-rational ones can be in both an animate thing and in an inanimate one, with the non-rational capacities, whenever what is capable of acting and what is capable of being affected meet up in the way appropriate to the capacity in question, it is necessary for the one to act and

381. Reading τὸ A, ἀνάγκη καὶ τὸ B εἶναι.
382. Reading δυνατόν.

for the other to be affected, but with the rational capacities it is not necessary; for all these non-rational capacities are such that one is productive of one thing, while the rational capacities are productive of contrary ones, so that [if they produced them in the way the non-rational ones do] they would produce contraries at the same time; but this is impossible.

There must, therefore, be something else that is the controlling factor. I mean by this desire or deliberate choice. For whichever of two alternatives an agent desires in a controlling way, this it will do, whenever it is such as to be capable and meets up with what is capable of being affected. So whenever anything that is capable in accord with reason desires what it has a capacity for, in the way in which it has the capacity, it is necessary for it to do this. And it has the capacity for that thing in that way whenever the thing affected is present and in the relevant condition, and if not, it will not be capable of acting (for it is not further necessary to add to the definition "provided nothing external prevents it"; for it has the capacity as a capacity to act, not in all circumstances, but under certain conditions, among which will be the exclusion of external things preventing it; for these are precluded by some of the things present in the definition). That is why even if someone has a wish or an appetite to do two things or contrary things at the same time, he will not do them; for it is not in this way that he has the capacity for them, nor is it a capacity to do them at the same time, since it will do the things for which it is the capacity in the way in which it is the capacity.

9.6
Being as an Activity; What an Activity Is

Since the capacity [or potentiality] that is said of things with reference to movement has been spoken about, let us make some distinctions concerning activity, both concerning what it is and what sort of thing it is. For the capable too will at the same time become clear as we make our determinations, because we do not say only of what naturally moves something else, or is moved by something else, that it is capable, whether unconditionally or in a certain way, but also use the term in a different way, which is why in the course of our inquiry we went through the former.[383]

Activity, then, is the existence of the thing not in the way in which we say that it exists potentially. And we say, for example, that Hermes exists potentially in the wood and the half-line in the whole, because it could be abstracted from it, and that even someone who is not contemplating is a scientific knower if he is capable of contemplating; other things exist actively.

What we wish to say is clear from particular cases by induction, and we must not look for a definition of everything, but be able to comprehend the analogy, that it is

383. 1045[b]35–1046[a]4.

as what is building is in relation to what is capable of building, and what is awake is
1048b1 in relation to what is asleep, and what is seeing is in relation to what has its eyes closed but has sight, and what has been shaped out of the matter is in relation to the matter, and what has been finished off is to the unfinished. Of the difference exemplified in this analogy let the activity be marked off by the first part, the potentiality by the
5 second. But things are said to actively *be*, not all in the same way, but by analogy—as this is in this or to this, so that is in that or to that; for some are as movement in relation to a capacity [or a potential], and the others as substance to some sort of matter.

But the unlimited, the void, and things like that are said to *be* potentially or
10 actively in another way from many of the other beings[384]—for example, from what sees or walks or is seen. For the latter things can sometimes also be truly said to *be* unconditionally[385] (for what is seen [is said to be seen], on the one hand, because it is being seen and, on the other, because it is capable of being seen). But the unlimited is potentially, not in this way, that it will be actually separable, but in knowledge. For
15 it is by the division's not coming to an end that the unlimited's potential being allows this activity, not by the unlimited's being separated.[386]

Of the actions that have a limit none is an end, but all are in relation to an end—for example, making thin. For the things themselves, when one is making them thin,
20 are in movement in this way, that what the movement is for the sake of does not yet belong to them. Hence these [movements] are not cases of action, not of complete action, at any rate; for none is an end; but the sort in which the end belongs really is an action. For example, at the same time one is seeing a thing and has seen it, is thinking something and has thought it, is understanding something and has understood it, while it is not the case that at the same time one is learning something and has learned it, nor that one is being made healthy and has been made healthy. Someone
25 who is living well, however, at the same time has lived well, and is happy and has been happy. If this were not so, these would have to come to an end at some time, as when one is making something thin. But as things stand it is not so, but one is living and has lived. Among these, then, one sort should be called "movements" and the other "activities." For every movement is incomplete[387]—for example, making thin, learning, walking, building. These are movements and are certainly incomplete. For it
30 is not the case that at the same time one is walking and has taken a walk, nor that one is building something and has built it, or is coming to be something and has come to be it, or is being moved in some way and has been moved in that way, but they are different, as are one's moving and having moved something.[388] By contrast the same thing at the same time has seen and is seeing, is understanding and has understood. The latter sort, then, I call an "activity," the former a "movement."

384. Reading ἢ πολλοῖς τῶν ὄντων.
385. I.e., what they actively or actually are.
386. Reading τῷ . . . τῷ. . . .
387. *DA* 431a6–7.
388. Retaining καὶ κινεῖ καὶ κεκίνηκεν.

What actual being is, then, and what sort of thing it is, should be clear to us from these and other similar considerations.

9.7
When a Thing Is Potentially Something

But when a given thing is potentially something, and when it is not, must be determined; for it is not potentially something at just any time whatever. For example, is earth potentially a human? Or is that not so, but rather when it has already become **1049ª1** seed, and perhaps not even then? It is just like the way not everything can be made healthy, whether by the craft of medicine or by luck; rather, there is a certain sort of thing that is capable of being made healthy, and this is what is potentially healthy. And the defining mark of what, as a result of thought, comes to be actual from what is potential is that, when it is wished for, it comes about if nothing external prevents it, while on the other side—in what is being made healthy—it is when nothing in it prevents it. It is the same way with what is potentially a house: if none of the things in this—that is, in the matter—prevents it from coming to be a house, and if there is nothing which must be added, subtracted, or changed, this is potentially a house, and the same is true for each of the other things for which the starting-point of coming to be is external.

And for the things, then, that have the starting-point within themselves, each is potentially each of the things—if nothing external prevents it—that will come to be because of itself; for example, the seed is not yet potentially a human (for it needs to be placed in something else[389] and to change), but when, because of a starting-point that belongs to itself, it is already in the latter state—it is already potentially human. The seed, though, needs another starting-point, just as earth is not yet potentially a statue (for it is after having changed that it will be bronze).

It seems that when we say that something is not this, but rather thaten[390]—as, for example, we say that a box is not wood but wooden, and the wood not earth but earthen, and again with earth if it is similarly not another this, but rather thaten—the latter is always unconditionally the next one up potentially. For example, the box is not earthen nor earth but wooden; for wood is potentially a box and this is matter of a box—the wood unconditionally of the box unconditionally, and of this box, this wood. But if there is something primary that is no longer said to be thaten with reference to something else, this is prime matter—for example, if earth is [not air but] airen, and air is not fire but firen, fire is prime matter, since it is not a this something.[391]

389. Reading δεῖ γὰρ ἐν ἄλλῳ πεσεῖν. I.e., in the menses that will constitute the body of the emerging fetus.
390. $1033^{a}7$.
391. Because it is not composed of some further matter.

For the that of which [something is said], or the underlying subject, differs in this way, by being or not being a this something. The underlying subject for affections is, for example, a human, both body and soul, while the affection is the musical or the pale (but when music is present in it, the thing is said to be not music but musical, and the human not paleness but pale, and not a walk or a movement but walking or moving, as with thaten). In cases like this, then, the ultimate underlying subject is substance. But in cases that are not like this, but where what is predicated is a form and a this something, the ultimate underlying subject is matter and material substance. And so it quite correctly turns out that things are said to be thaten both with reference to their matter and to their affections; for both are indefinite.

When something must be said to be potentially something, then, and when not, has been stated.

9.8
The Priority of Activity to Potentiality

Since it has been determined[392] in how many ways things are said to be prior, it is evident that activity is prior to potentiality. I mean by "potentiality" [or "capacity"] not only that defined sort that is said to be a starting-point of change in another thing, or [in something] insofar as it is other, but also, in general, all starting-points of change or remaining at rest. For nature is also in the same kind as potentiality; for it is a starting-point of movement—not, however, in another thing but in the thing itself insofar as it is itself. To all this sort of potentiality, then, activity is prior both in account and in substance, while in time it is prior in one way and in another not.

But that it is prior in account is clear; for what is in the primary way potential is potential because it admits of becoming active—for example, by "capable-of-building" I mean what is capable of [actively] building, and by capable-of-seeing what is capable of [actively] seeing, and by capable-of-being-seen what is capable of [actively] being seen; and the same account also applies in the other cases, so that it is necessary for the account and the knowledge of the one to precede the account and knowledge of the other.

In time activity is prior in this way: the active that is the same in form, though not in number, is prior. I mean this, that to this human who is already actively what he is, and to the wheat and to what is actively seeing, the matter and the wheat and the capable-of-seeing, which are potentially a human and wheat and seeing, but not yet actively so, are prior in time. Prior in time to these, however, are other things that are actively what they are, from which these came to be; for what is actively always comes to be from what is potentially, as a result of what is actively (for example, human comes from human, musician as a result of musician), there being always a first

392. 5.11.

mover; and the [first] mover already is actively. And it was stated[393] in the accounts concerned with substance that everything that comes to be, comes to be something, from something, and as a result of something, and this is the same in form as it.

That is also why it seems impossible for someone to be a builder if he has built nothing or a harpist if he has never played the harp; for someone who learns to play the harp learns to play the harp by playing the harp, and similarly too for the other people. It is from this that the sophistical refutation arises, that someone who does not have scientific knowledge will be doing what the scientific knowledge is knowledge of;[394] for someone who is learning does not have it. But because something of what is coming to be must have come to be, and in general, something of what is moving must have moved (this is made clear in the discussions concerning movement), the one who is learning too must presumably have something of the science. But it is also clear, at any rate, that in this case too activity is prior in this way to potentiality too, namely, in coming to be and time.

But then it is also prior even in substance, first, because the things that are posterior in coming to be are prior in form and in substance—for example, man to boy and human to seed; for the one already has the form, while the other does not—and because everything that comes to be proceeds toward a starting-point and an end (for the for-the-sake-of-which is a starting-point, and the coming to be is for the sake of the end), and the activity is the end, and it is for the sake of this that the capacity [or potentiality] is acquired. For animals do not see in order that they may have sight; rather, they have sight in order that they may see, and similarly too people have the craft of building in order that they may build and the capacity to contemplate in order that they may contemplate. But they do not contemplate in order that they may have the capacity to contemplate, except those who are practicing, and they do not contemplate except in this way, or because there is nothing they need to contemplate.[395]

Further, the matter is potentially something because it may come in the form of it—at any rate, when it is actively something, it *is* in the form of it. It is the same way in the other cases, even those in which the end is a movement. That is why, just as teachers think that they have delivered the end result when they have demonstrated [their student] in activity, nature also does likewise. For if it does not happen in this way, it will be like Pauson's Hermes; for it will even be unclear whether the scientific knowledge is inside or outside,[396] just as with that figure. For the work is the end,

393. 7.7–8.

394. *NE* 1105ᵃ17–25.

395. Reading ἢ ὅτι οὐδὲν δέονται θεωρεῖν. Those who are practicing not in order to acquire the capacity but in order to retain it have the capacity to contemplate but may not activate it (on a given occasion) because they have no need to do so (then).

396. Unless we see a student activate his scientific knowledge in appropriate circumstances, it will be unclear whether he has it autonomously or is merely repeating what he has heard from his teacher.

and the activity is the work, and that is why the name "activity" is said of things with reference to the work, and extends to the actuality.

And, while in some cases it is the use that is the ultimate thing (for example, seeing in the case of sight, and nothing else beyond this comes to be from the work of sight), from other things something [else] does come to be (for example, from the craft of building a house comes to be that is beyond the activity of building), yet the use is in the former case no less the end, and in the latter case more the end, than the capacity is; for the activity of building is in what is being built and comes to be and is at the same time as the house. In the cases, then, where what comes to be is some other thing beyond the use, in those cases the activity is in what is being produced—for example, the activity of building is in what is being built, the activity of weaving is in what is being woven, and similarly in the other cases, and in general, the movement is in what is being moved. But in all the cases where there is not some other work beyond the activity, the activity is in the relevant things—for example, the seeing is in the one who sees, the contemplating in the one who contemplates, and the living in the soul (which is why happiness is also in it; for it is a certain sort of living[397]). So it is evident that the substance and the form are activity.

In accord with this argument, then, it is evident that activity is prior in substance to potentiality, and, as we have said,[398] one activity always precedes another in time until one reaches the activity of what primarily and eternally causes movement.[399]

But then activity is also prior in a stricter sense; for eternal things are prior in substance to things that pass away, and nothing eternal exists potentially. The reason is this. Every capacity [or potentiality] is at the same time for something and for the contradictory; for while what is incapable of belonging cannot belong to anything, everything that is capable admits of not being active. So what is capable of being admits both of being and of not being. Therefore, the same thing is capable both of being and of not being. But what is capable of not being admits of not being. And what admits of not being can pass away, either unconditionally or in that way in which it is said to admit of not being, with respect to place, or to quantity, or to quality; and unconditionally is with respect to substance. Therefore, none of the things that cannot unconditionally pass away are unconditionally potential (although nothing prevents one from being so in a certain respect—for example, with respect to quality or place). So all of them are actively [what they are]. Nor are any of the necessary beings potential ones (and yet these are primary things; for if they were not, nothing would be). Nor, then, is movement potential, if some movement is eternal. Nor, if there is something that is eternally moved is it moved in accord with a capacity [or potentiality], except from somewhere to somewhere (but nothing prevents matter for this sort of movement from belonging to it).

That is why the sun, the stars, and the whole heaven are always active, and there is no fear that they may sometime stand still, which is what those concerned with

397. *NE* 1098a12–18.
398. 1049b24–29.
399. 12.7.

nature fear,[400] nor do they get tired doing this; for movement is not for them connected with a capacity for the contradictory, as it is for things that can pass away, so that the continuity of the movement is laborious; for the substance that is matter and potentiality, and not activity, is what causes this.

The things that cannot pass away are also imitated by things that are involved in change—for example, earth and fire. For these too are always active; for they have their movement both intrinsically and within themselves. But the other capacities, from what has been determined about them, are all for something and for the contradictory (for what is capable of moving something in this way is also capable of moving it not in that way), at any rate, in all cases that are in accord with reason. And the same non-rational capacities will, by their presence or non-presence, be for something and for its contradictory.

Therefore, if there are some natures or substances of the sort that the people involved in accounts say the Forms are, there will be something that is much more of a science than science-itself, and much more of a movement than movement[-itself]; for the former are more activities and the latter capacities for them. **1051^{a}1**

That activity is prior both to potentiality and to every starting-point of movement, then, is evident.

9.9[401]
Activity More Estimable Than Potentiality; Activity and Potentiality in Knowledge

It is clear from the following considerations, however, that the activity is also better and more estimable than the excellent capacity. For in the case of those things that are said to *be* with reference to being capable, the same one is capable of contraries—

400. *Cael.* 284^{a}11–26.

401. (1) In 1.2, Aristotle argues in a preliminary way that theoretical wisdom must, as the most estimable science, deal with the most estimable beings, and so be a sort of theology (982^{b}24–983^{a}11). In 6.1, he argues that theology, though dealing with a single kind, could nonetheless be the right sort of universal science to be theoretical wisdom (1026^{a}23–32). (2) In 7.1, he argues that the focus of this science must be substance, since it is primary in account, in knowledge, and in time (1028^{a}31–^{b}7). Form then emerges as apparently the best candidate to be substance (1029^{a}26–33), but matter (or material substance) remains on the scene (1035^{a}2, 1042^{a}32). Then form gets identified with activity or actuality, matter with potentiality (1043^{a}4–26). (3) In 9.8, activation or actuality is argued to be prior to matter (or material substance) in account, in time, and in substance, and to be the end for the sake of which a capacity is acquired or possessed (1050^{a}8–10). (4) 9.9 becomes easier to understand if we see the first part (1051^{a}4–21) in relation to (1), arguing that activity or actuality (form) is more estimable than potentiality (matter), and so is a better candidate to be the focus of the science of being qua being, and the second part (1051^{a}21–33) in relation to (2), arguing that actuality is also prior in knowledge to potentiality, and so is in that respect too a better candidate to be primary substance. It then emerges as completing the project of (3) in an intelligible way.

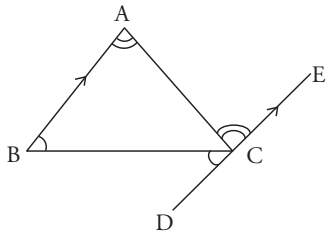
for example, the same thing that is said to be capable of being healthy is also capable of being sick, and at the same time; for the same capacity is the capacity to be healthy and to be sick, to be resting and to be moving, to build and to demolish, and to be built and to collapse. The capacity for contraries, then, is present at the same time.

For the contraries to be present at the same time, however, is impossible, and for the activities to be present at the same time is impossible (for example, being healthy and being sick), so that it is necessary for the good to be one or the other of them. But being capable is of both alike, or of neither. Therefore, the activity is better. And it is necessary in the case of the bad things too for the end and the activity to be worse than the capacity; for the same thing is capable of both contraries. It is clear, therefore, that the bad does not exist beyond the things; for the bad is posterior in nature to the capacity.[402] Therefore, neither in the things that there are from the start nor in the eternal things is there anything bad, in error, or destroyed (for destruction is also something bad).

And geometrical diagrams are discovered actively; for people discover them by actively dividing. If they had already been divided, they would be evident; but as it was they were present potentially. Why are the interior angles of a triangle equal to two right angles? Because the angles around one point are equal to two right angles. If, then, the line had already been drawn upward parallel to the side, why this is so would be immediately clear on seeing it.[403] Why is the angle in a semicircle universally a right angle? Because if three lines are equal, the two that form the base and

402. The bad, as the activation of a bad capacity, cannot exist without that capacity, but the bad capacity can exist without being activated.

403. The triangle whose interior angles we must prove equal to two right angles is ABC:



The division actively made is to draw DC upward through C parallel to AB. Angle ABC = BCD (alternate angles). Angle BAC = ACE (alternate angles). Therefore, the angles BCD + ACB + ACE = ABC + ACB + BAC. But the angles BCD + ACB + ACE = the angles around the point C = two right angles. Therefore, ABC + ACB + BAC = the interior angles of the triangle ABC = two right angles. It is not implausible to claim that as soon as DE is actually drawn, we can see immediately that this is so.

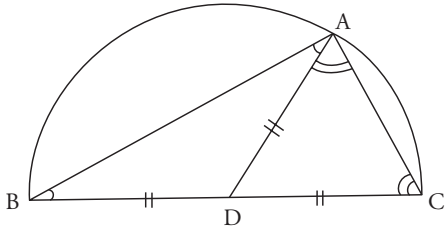
the one dropped straight from the center, it is clear on seeing it to the person who knows that.[404]

So it is evident that the things that are potential are discovered when they are actively drawn. And the cause of this is that understanding is the activity, so that what is potential [is discovered] from the activity, and because of this they know by [actively] producing (for the single activity is posterior in coming to be).

9.10[405]
True and False Being; the Case of Incomposites; Understanding and Error

Since something is said to *be* or *not to be*, in some cases with reference to the figures of predication, in others with reference to the potentiality or activity of these or to their contraries, and in others by being in the strictest sense true or false, and since **$1051^{b}1$**

404. The division actively made is to draw (or drop) DA from the center D to the circumference.



BD = AD = CD (radii of the same semicircle). Therefore, BAD and CAD are isosceles triangles. Therefore, the angle BAD = ABD and the angle CAD = ACD (base angles of isosceles triangles are equal). Therefore, the angle BAC (which = BAD + CAD) = ABD + ACD. But ABC + ACB + ACE = two right angles (previous result). Therefore, the angle BAD must be a right angle.

405. (1) 6.4 excludes from the purview of theoretical wisdom the sort of being that is being true or being false, considered as affections of beliefs or propositions. At the same time, it adverts to a kind of truth and falsity that is in things rather than in beliefs or propositions ($1027^{b}25–26$). In the case of "simple things and the what-it-ises," it tells us that truth and falsity are "not even in thought," and so not in things either ($1027^{b}27–28$). (2) 7.17 renews the search for substance as the key to being qua being, by focusing on the fact that "the substance is a starting-point and cause" ($1041^{a}9–10$). As such, it must be the answer to the question "Why does one thing belong to a certain other?" ($1041^{a}10–11$), so that "what is being looked for is the cause in virtue of which the matter is something. But this is the substance" ($1041^{b}7–9$). Exempted from such inquiry and teaching, however, are "things [said] simply" ($1041^{b}9–11$), where "one thing is not said of another" ($1041^{a}34–^{b}2$).

this, in the case of the things, is being combined or being divided,[406] so that a person grasps what is true when he thinks what is divided to be divided or what is combined to be combined, while he grasps what is false when his state is contrary to that of the things—when is there and when is there not what we call "true"[407] or "false"? For what we mean by this must be investigated. For it is not because we truly think you to be pale that you are pale, but it is because of your being pale that we who say this grasp what is true.

So if some things are always combined and it is impossible for them to be divided, and others are always divided and it is impossible for them to be combined, while others admit of both contraries, then, while to be is to be combined and one, not to be is not to be combined and many. As regards the things that admit of both contraries, then, the same belief or the same account comes to be false and true, and admits at one time of grasping what is true and another time of grasping what is false, but as regards the things that cannot be otherwise, it does not come to be at one time true and at another time false; rather, the same ones are always true or always false.

As regards the incomposite things, then, what is being or not being and what is truth and falsehood? For they are not composite, so that they would be if combined and not be if divided, like the pale and the log or the incommensurable and the diagonal, nor will truth and falsehood still hold in the same way in their case. Or, rather, just as truth is not the same in their case, neither is being. Instead, truth or falsity consists in this—to touch and to phrase are true (for an affirmation and a phrase are not the same),[408] but to be ignorant is not to touch. For it is not possible to be mistaken about the what-it-is, except coincidentally; and the same holds with regard to incomposite substances, for it is not possible to be in error about them; and they are all active, not potential, for otherwise they would have come to be and passed away. But as things stand being does not itself come to be or pass away; for if it did, it would have to come to be from something.

Thus, with regard to those things that are precisely what something is and activities,[409] it is not possible to be in error, but either to understand or not understand, but where they are concerned, their what-it-is is inquired about, whether they are such-and-such or not. With being as truth and not being as falsehood, by contrast, one sort, if it is in fact combined, is true, while if it is not combined, it is false, the other sort is if indeed it is a being in this way, while if it is not [a being] in this way, it is not. But truth is understanding these things, while falsehood does not exist and neither does any error, but ignorance does exist, though it is not like blindness; for blindness would be like wholly lacking the part that understands.[410]

406. Reading τὸ συγκεῖσθαι ἢ διῃρῆσθαι.
407. Reading τὸ ἀληθὲς λεγόμενον.
408. *Int.* 16ᵇ26–30.
409. Reading ἐνέργειαι.
410. *DA* 430ᵇ26–30.

It is evident too that about the immovable things there can be no mistake as regards time, if one supposes them to be immovable. For example, if one thinks that the triangle does not change, one will not think that at one time it has interior angles equal to two right angles and that at another time it does not (for in that case it would change), but that one sort is and another sort is not—for example, that no even numbers are prime, or that some are and some are not. But about a single thing that is one in number not even this [sort of mistake can occur]; for one will no longer think that one thing is and another is not, but will grasp what is true or grasp what is false as always being that way.

BOOK 10 (IOTA)

10.1
The Ways in Which Beings Are Said to Be Intrinsically One; the Being for a One

It was stated previously,[411] in our discussions concerning in how many ways things are said, that things are said to be one in many ways. But though they are said to be so in many ways, there are four ways of bringing together under headings the things that are primary and said to be one[412] intrinsically, not coincidentally.

There is the continuous, either unconditionally or most so by nature, and not by contact or by being tied together (and of these, what is more one and prior is what has a more indivisible and simpler movement).

Further, even more like this is what is a whole and what has a certain shape and form, and most so if it is like this by nature and not by force, as things are that are glued or nailed or tied together, but has within itself the cause of its own continuity. And it is like this because its movement is one and indivisible in place and in time, so that it is evident that if something has by nature the primary starting-point of the primary movement (I mean circular spatial movement),[413] it is the primary thing that is one in magnitude.

Some things, then, are one in this way, by being continuous or whole, while the other things that are one are those whose account is one. And things of this sort are things of which the understanding is one,[414] and things of this sort are things of which the understanding is indivisible, and it is indivisible when the thing is indivisible in form or in number. In number, then, the particular is indivisible, while in form

411. 5.6.
412. Reading πρώτων.
413. *Ph.* 265[a]16–17.
414. *DA* 430[b]14–15.

it is what is so in knowability and in scientific knowledge, so that the primary thing that is one would be the cause of substances' being one.

Things, then, are said to be one in this many ways: the continuous by nature and the whole, the particular, and the universal. And all these are one because of the indivisibility in some cases of their movement and in others of their understanding or their account.

1052b1 One should understand that the following must not be taken to be equivalent: what sorts of things are said to be one? and what is the being for a one? That is, what is the account of it? For things are said to be one in this many ways, and each thing will be one when one of these ways of being one belongs to it. But the being for a one will sometimes be the being for one of these things and sometimes for something else that is even closer to the name, while the former things are closer to its capacity.[415] It is just as is the case with element or cause, if one had to speak about them both by distinguishing the things to which they apply and by giving the definition of the names. For in one way fire is an element (or perhaps what is intrinsically so is the unlimited or something else of this sort), while in another way it is not; for the being for fire and the being for an element are not the same; but rather, while as a thing and a nature fire is an element, what the name "element" signifies is that this belongs to it, that something is from it as a primary component. And it is likewise too in the case of cause and one and all such things.

That is also why the being for one is the being for what is indivisible, namely, being precisely a this and on its own, inseparable[416] either in place or in form or in thought, or again with respect to what it is to be a determinate whole,[417] but most of all by being the first measure of each kind, and, in the strictest sense, of that of quantity; for it is from this that it has been extended to the others; for a measure is that by which a quantity is known, and a quantity insofar as it is a quantity is known either by a one[418] or by a number, and all number by a one, so that all quantity insofar as it is quantity is known by the one, and what quantities are primarily known by, this very thing is one. That is why the one is the starting-point of number insofar as it is number. And, by extension from this, so too in the others what is said to be a measure is the primary thing by which each is known, and the measure of each thing is a one, in length, in breadth, in depth, in weight, or in speed (for weight and speed are common to both contraries; for each is twofold—for example, weight is both what has any tendency of whatever degree to move down and what has an excessive tendency to move down, and speed is what has any amount of movement whatever and what has an excess of movement; for there is some speed even of the slow, and weight of the lighter).

In all these, then, the measure and starting-point is something that is one and indivisible, since even in lines we use the one-foot line as indivisible. For everywhere

415. I.e., that of the name to apply to various things.
416. Reading ἀχωρίστῳ (1016b2).
417. Reading τῷ ὅλῳ καὶ διωρισμένῳ.
418. I.e., a unit.

people seek as a measure something that is one and indivisible; and this is the simple in either quality or quantity. Where it seems impossible to take away or add, then, this measure is exact, which is why that of number is most exact; for people posit the unit as in every way indivisible. And in the other cases they imitate this sort of measure; for in the case of a stade, a talent, or anything comparably large, some addition or subtraction might more readily escape notice than in the case of something smaller. So the primary thing from which, as far as perception goes, that cannot happen, this is what everyone makes a measure, whether of liquids or of solids, weight or magnitude, and they think they know the quantity when they know it by means of this measure.

And what is more, people think they know movement too by the movement that is simple and fastest (for this takes the least time). That is why in astronomy a one of this sort is a starting-point and measure (for they posit the movement of the heaven to be uniform and fastest, and judge the others relative to it), and in music, it is the quarter-tone (because it is the smallest interval), and in speech the phonetic element. And all these are one something in this way—not that a common something is the one in all, but in the way stated. The measure is not always one in number; sometimes there are several—for example, the quarter-tones are two (not to hearing but in the ratios involved), and the voiced sounds by which we measure are several, and the diagonal is measured by two measures,[419] and so are all magnitudes.

In this way, then, the measure of all things is the one, in that we come to know the things from which substance is [constituted] when we divide either with respect to quantity or with respect to the form. And it is because of this that the one is indivisible, because the primary measure of each of these is indivisible. But not every measure is indivisible in the same way—for example, a foot and a unit. Instead, a unit is so in every way, while a foot is meant to be[420] among the things that are perceptually indivisible, as has already been said;[421] for presumably everything continuous is divisible.

(The measure is always in the same kind as what is measured; for that of spatial magnitudes is a spatial magnitude, and, in particular, of length a length, of breadth a breadth, of voiced sound a voiced sound, of weight a weight, and of units a unit. For this is the way the latter case must be supposed to be, and not the way that the measure of numbers is a number. And yet that would be necessary, if it were supposed to be a similar way to the others. But it is not really a similar claim. On the contrary, it would be like claiming that the measure of units is units, and not a unit; but a number is a plurality of units.)

Also, we say that scientific knowledge is a measure of things, as is perception, because of the same thing, that we come to know something by them, since really

419. Secluding καὶ ἡ πλευρά ("and so is the side").
420. Reading ἐθέλει εἶναι.
421. $1052^{b}33$, $1053^{a}5$.

they are measured more than they measure. It is as if someone else measured us and we came to know how big we are by seeing that he applied the cubit-measure to such-and-such a fraction of us. But Protagoras says[422] that "man is the measure of all things," as if he had said "the man who has scientific knowledge" or "the man who perceives," and that these are the measure because they have, in the one case, perception and, in the other, scientific knowledge, which we say are measures of the underlying objects. People who say what Protagoras says, then, are saying nothing, though they appear to be saying an extraordinary thing.

It is evident, then, that the being for a one, when defined with regard to the meaning of the name, is most of all a certain measure, and in the strictest sense of quantity, and after that of quality. And one thing will be of this sort if it is indivisible with respect to quantity, and another if it is so with respect to quality, which is why the one is indivisible, either unconditionally or insofar as it is one.

10.2
The Substance and Nature of the One

With regard to the substance and the nature of the one, however, it must be investigated in which of two ways it stands, just as in going through the puzzles[423] we went through what one is and how we should get a grasp on it, whether we must grasp the one itself as being a certain substance (as the Pythagoreans say earlier and Plato later), or whether instead a certain nature underlies it, and one should say what one is in some more familiar way and more in the manner of those concerned with nature; for of those, one says that the one is love, another air, and another the unlimited.[424]

If, then, none of the universals can be substance, as was said in the accounts concerned with substance and with being,[425] and because being cannot itself be substance in the sense of some one thing beyond the many (for it is common [to all of them]), but instead is only something predicated, clearly one cannot be substance either; for being and one are the most universally predicated things of all. So the kinds are neither certain natures and substances separable from the other things nor—due to the same causes as in the case of being and substance—can one be a kind.

Further, the same must hold in all cases. Things, though, are said in the same number of ways to be one and to be. So if indeed among qualities the one is a certain thing and a certain nature, and similarly too among quantities, it is clear that it must be investigated, in general, what one is, just as with what being is, on the grounds that it is not enough to say that its nature is just this[: to be one]. But then among colors, the one is a color, white, and so the other colors are seen to come to be from this and

422. 1009a6–16.
423. 1001a4–1001b25 (= P11).
424. Empedocles, Anaximenes, Anaximander.
425. 7.13.

black, and black is the privation of white, just as dark is of light. So if the beings were colors, the beings would be a certain number, but of what? Clearly, of colors. And the one would be a certain one, white. Similarly, if the beings were melodies, they would be a number, this time of quarter-tones. But the substance of them would not be number, and the one would be something whose substance was not the one but the quarter-tone. And similarly in the case of sounds, the beings would be a number of phonetic elements, and the one would be a thing voiced. And if they were rectilinear figures, they would be a number of figures, and the one would be the triangle. And the same account applies to the other kinds. So if indeed in affections, in qualities, in quantities, and in movement there are numbers and a certain one, in all of them the number is a number of certain things and the one is one something, but this is not its[426] substance. And the same must hold in the case of substances; for the same holds in all cases.

It is evident, then, that the one is a certain nature in every kind and that in no case is its nature just this very same thing; rather, just as in colors the one itself that must be investigated is one color, so too in substance the one itself that must be investigated is one substance. And that one in a way signifies the same as being is clear from the fact that it follows along with the categories in the same number of ways and by its not being in any category (for example, not in the what-it-is and not in quality either, but having the same relation to them as being does); from the fact that no other thing is additionally predicated in one human than in human (just as being is not something beyond the what or quality or quantity); and from the fact that being for one is just the being for the given thing.

10.3
Same, Similar, Distinct, Different, Contrary

The one and the many are opposed in several ways, of which one is that of the one and the plurality as indivisible and divisible; for what is either divided or divisible is said to be a sort of plurality, while what is indivisible or not divided is said to be one. Since, then, oppositions are of four sorts, and one of the opposites is said of things as a privation, they must be contraries,[427] and be said neither as contradictory nor as relatives. And the one is said to be [what it is] and is made clear from the contrary, the indivisible from the divisible, because what is a plurality and divisible is more perceptible than what is indivisible, so that in account the plurality is prior to the indivisible because of perception. And with the one belong—as we diagrammed in our division of the contraries[428]—the same and the similar and the equal, and with plurality, the other, the dissimilar, and the unequal.

426. Reading αὐτοῦ.
427. Reading ἐναντία ἂν εἴη καὶ.
428. 1004^{a}2.

Things are said to be the same in many ways. One is that we sometimes say the same with respect to number.[429] Another is if they are one both in account and in number—for example, you are said to be one with yourself both in form and in matter. Further, if the account of their primary substance is one—for example, equal straight lines are the same, as are equal and equiangular quadrilaterals, and yet they are many; but in these equality constitutes oneness.

Things are similar[430] if, while not being unconditionally the same, nor without difference with respect to their composite substance, they are the same with respect to their form, as the larger square is similar to the smaller. And unequal straight lines are similar—similar, yes, but not unconditionally the same. Other things are similar if, having the same form, and being things in which the more and less occurs, they are neither more nor less than each other. Other things, if they have affections that are in form one and the same (for example, the white) to a greater or lesser degree, are said to be similar because the form of these is one. Other things if they have more of the same than of different affections, either unconditionally or the more obvious ones—for example, tin is like silver in that it is white, or fire like gold in that it is yellow and flame-colored.

So it is clear that things are also said to be distinct [or other] and dissimilar in many ways. That is, on the one hand, they are said to be distinct or the same in opposite ways, which is why everything is related to everything either by being the same or by being distinct, but, on the other, they are said to be distinct unless both their matter and their account are one (which is why you and your neighbor are distinct). And the third way things are said to be distinct is the way the objects of mathematics are. Because of this, then, everything can be said to be distinct or the same in relation to everything, that is, of those said to be one and to *be*; for distinct is not the contradictory of same, which is why it is not said of the non-beings (while not-the-same is said), but all the beings are said to be distinct; for everything that is and is one is by its nature either one or not one [with such a thing].

The distinct, then, and the same are opposed in this way. But difference is not the same as distinctness. For the distinct and what it is distinct from are not necessarily distinct in some respect (for whatever is a being is either distinct or the same), but the different is different from something in some respect, so that it is necessary for there to be something that is the same whereby they differ. And this thing that is the same is kind or form; for all things that differ, differ either in kind or in form—in kind if the things do not have their matter in common and if there is no coming to be from one to the other (for example, things whose figure of predication is not the same), and in form if they have the same kind (and what is said to be a kind is that same thing which both of the different things are said to *be* with respect to their substance).

429. As when A and B are coincidentally one (1015b17–36).
430. 1018a15–18.

Contraries are different and contrariety is a sort of difference. It is clear from induction that this hypothesis is correct; for all these contraries too are manifestly different and not merely distinct; rather, some are distinct in kind, while others are in the same column of predication, and so they are in the same kind and are the same in kind. It has been determined elsewhere[431] what sorts of things are the same or distinct in kind. **1055^{a}1**

10.4
Contrariety

Since things that differ can differ from each other more or less, there is also a sort of greatest difference, and this I call "contrariety." That it is the greatest difference is clear from induction. For things that differ in kind do not have a route to each other, but are too far distant, and not comparable. And for those that differ in form, the comings to be are from the contraries as extremes, and the distance between the extremes is greatest, so that it is also greatest between the contraries.

But surely the greatest in each kind is complete. For the greatest is what cannot be exceeded, and a complete thing is that outside of which no part can be found; for the complete difference has an end (just as other things are said to be complete due to having an end), and outside the end there is nothing; for in everything the end is the extreme and encompasses everything else, which is why there is nothing outside it, and why the complete needs nothing further.

From these considerations, then, it is clear that contrariety is complete difference. But as things are said to be contraries in many ways, the completely contrary will follow along with the ways that being contrary belongs to them.

These things being so, it is evident that one thing cannot have more than one contrary (for there cannot be anything more extreme than the extreme and there cannot be more than two extremes of the same extension), and in general, if contrariety is a difference, and a difference is between two things, so too must the complete difference be.

But the other definitions of contraries must also be true. For in fact the complete difference is the greatest difference (for outside the things that differ in kind or in form no further difference can be found; for it has been proved that in relation to things outside the kind there is no difference, while in those in the kind the complete difference is the greatest). Also, the things in the same kind that differ the most are contraries (for the complete difference is the greatest difference between these). Also, the things in the same receptive subject that differ the most are contraries (for the matter for contraries is the same). And the things that fall under the same capacity

431. 1016^{a}24–32, ^{b}33–34, 1024^{b}9–16.

that differ the most are contraries (for the science that is one science is also concerned with one kind), and in these the complete difference is the greatest.

The primary contrariety, however, is that between having and privation—not every sort of privation, though (for something is said to be a privation in many ways), but the sort that is complete. And the others will be said to be contraries with reference to these, some because they have these, others because they produce or are productive of them, others because they are acquisitions or losses of these or of other contraries.

If, then, the sorts of opposition are contradiction, privation, contrariety, and relatives, and of these the primary sort is contradiction, and of a contradiction there is no intermediate, while contraries do admit of one, it is clear that contradiction and contraries are not the same. But a privation is a sort of contradiction. For both what is entirely incapable of having something and what is naturally such as to have it but yet does not have it, is deprived of it, either generally or in some definite way (for here we are already saying that this is said in many ways, which we have distinguished elsewhere[432]), so that a privation is a sort of contradiction or incapacity, which is either definite or taken in combination with the receptive subject, which is why there is no intermediate of a contradiction, while for a sort of privation there is one; for while everything is either equal or not equal, not everything is either equal or unequal, or if indeed it is, it is only in what is receptive of the equal.

If, then, the comings to be in the matter are from contraries, and proceed either from the form and the having of the form or from a sort of privation of the form and the shape, it is clear that every contrariety would be a privation, but presumably not every privation is a contrariety (the cause of this is that there are many different ways in which what is deprived of something admits of being deprived of it); for it is the extremes from which the changes proceed that are contraries. And this is also evident through induction. For every contrariety has a privation as one of its contraries, but not all cases are alike; for, on the one hand, inequality is the contrary of equality, and unlikeness of likeness, but, on the other, vice is the contrary of virtue, and these cases differ in the way that has been stated;[433] for it is one case if the thing suffers a privation, but it is another if it does so at a certain time or in a certain way—for example, at a certain age or in the controlling part—or throughout. That is why in some cases there is something intermediate, and a human can be neither good nor bad, and in others there is not; rather, a number is necessarily either odd or even. Further, some contraries have a definite underlying subject, while others do not. So it is evident that one of the contraries is said of things as a privation. But it is enough if this is true of the primary ones, that is, the generic contraries (for example, the one and the many); for the others lead back to these.

432. 5.22.
433. 1055b4–6.

10.5
Puzzles about How the Equal Is Opposed to the Great and the Small

But since one thing is contrary to one thing, one might raise a puzzle about how the one is opposed to the many, and the equal to the great and the small.

For we say[434] "whether it is so-and-so" only in an antithesis, such as "whether it is white or black" or "whether it is white or not white" (but we do not ask whether it is human or white, unless we are proceeding on a hypothesis and inquiring about whether it was Cleon who came or Socrates). But this is not a necessary antithesis in any kind. Yet even it derives from the case of opposites; for only opposites cannot be present at the same time, and one makes use of this fact here too in asking whether it was the one or the other who came; for if it were possible for both to have come at the same time, the question would be ridiculous. But if it is possible for both to have come at the same time, even so the question falls just as much into an antithesis, **1056^{a}1** that of the one or the many, that is, one asks whether both came or one of the two. If, then, the question "whether so-and-so?" is always concerned with opposites, and it is asked whether something is greater or less or equal, what is the opposition of the equal to these? For it is not contrary to either alone or to both; for why should it be contrary to the greater rather than to the lesser?

Further, the equal is contrary to the unequal, so it will be contrary to more than one thing. But if the unequal signifies the same as both the greater and the lesser together, the equal will be opposite to both (and the puzzle supports those[435] who say that the unequal is a dyad), and it follows that one thing is contrary to two, which is precisely what is impossible.

Further, the equal is manifestly intermediate between great and small, but no contrariety is manifestly intermediate or, from its definition, can possibly be so (for it would not be complete if it were intermediate between something), rather, it always has something that is intermediate within itself.

It remains, then, that the equal is opposed to the great and the small either as negation or as privation. But it certainly cannot be the negation or privation of one of the two (for why of the great rather than of the small?); therefore, it is the privative negation of both—which is also why "whether" is asked of a thing with reference to both and not just to one of the two (for example, whether it is greater or equal, or whether it is equal or less), but instead there are always three terms. But it is not a necessary privation; for not everything that is either not greater or not less is equal, but only the things in which these are naturally found.

The equal, then, is the neither large nor small but is naturally fitted to be large or small, and is opposed to both as a privative negation, which is why it is intermediate between them.

434. Reading τὸ γὰρ.
435. Platonists ($1087^{b}7$).

Also, the neither good nor bad is opposed to both, but is nameless; for things are said to be each of these in many ways[436] and their receptive subject is not one—rather, the neither black nor white would be more so. But this is not said to be one either, although the things of which this is said as a privation are in a way definite; for they must be either gray or ochre or something else like that.

So those people[437] are incorrectly evaluating the matter who think that all such phrases are said of things in the same way, so that between shoe and hand there will be an intermediate, the neither a shoe nor a hand, seeing that the neither good nor bad is intermediate between the good and the bad, as if there will be something intermediate in all cases. But this does not necessarily follow. For in one case there is a joint negation of opposites between which there is a certain intermediate and a certain natural extension, while between the other two there is not a difference; for the things jointly denied are in different kinds, so that the underlying subject is not one.

10.6
Puzzles about How the One Is Opposed to the Many

One might also raise similar puzzles about the one and the many; for if the many are unconditionally opposed to the one, some impossible things follow. For the one will
1056b5 then be few (singular) or few (plural);[438] for the many are opposed also to the few. Further, the two will be many, if indeed the double is a multiple, and is said of things with reference to the two. So the one will be few; for in relation to what are the two many, if not in relation to the one and the few? For there is nothing smaller.

Further, if as the long and short are in length, so too in plurality are the much and the few, and if whatever is much is also many, and the many much (unless indeed there is a difference in the case of something continuous and easily bounded), the few will be a plurality. So the one is a sort of plurality, if indeed it is few too. But it must be this, if the two are many. But perhaps, though the many are in a way said to be also much, it is with a difference—for example, water is much but not many.

Things that are divisible, however, are said to be many—in one way if there is a plurality that has an excess, either unconditionally or in relation to something (and few in the same way is a plurality that has a deficiency), and in another way, in number, and it is only in this way that the many is opposed to the one. For it is in this way that we say that something is one or many, just as if one said one and ones, or white thing and white things, or the things measured and what is measurable relative to the measure—and multiples are said to be one or many in the same way; for each number is said to be many because of ones, and because each is measurable

436. *NE* 1096a23–29.
437. Identity unclear.
438. *Oligon* (singular), which also means "little," *oliga* (plural).

by the one, and in a way that is opposed to the one, not to the few. In this way, then, even the two are many, but as a plurality that has an excess, either in relation to something or unconditionally, they are not—rather, they are the first plurality. Unconditionally, the two are few; for they are the first plurality with a deficiency.[439] That is why Anaxagoras incorrectly abandoned his task when he said that "all things were together, unlimited both in plurality and in smallness."[440] Instead of "and in smallness" he should have said "and in fewness"; for they could not have been unlimited in fewness, since the few is not [what it is] because of the one, as some say, but because of the two.

The one is opposed to the many[441] in the case of numbers, then, as measure is to measurable. But these are opposed as those relatives are that are not intrinsically relatives. We have determined elsewhere that things are said to be relatives in two ways,[442] some as contraries, others in the way that scientific knowledge is related to the scientifically knowable, where something is said to be relative because something else is relative to it. Nothing, however, prevents the one from being less than something—for example, than the two; for it is not the case that if it is less, it is also few.

Plurality is like a kind of number; for number is plurality that is measurable by one, and so the one and number are in a way opposed—not as contrary, but in the way it was said that certain relatives are; for insofar as one is measure and the other measurable, in that way they are opposed, which is why not everything that is one is a number—for example, if something is indivisible it is not a number. And though scientific knowledge is said to be in the same way relative to the scientifically knowable, the way does not turn out to be the same. For while scientific knowledge may seem to be the measure and the scientifically knowable what is measured, the fact is that all scientific knowledge is scientifically knowable but not all that is scientifically knowable is scientific knowledge, because in a way it is scientific knowledge that is measured by the scientifically knowable.[443]

Plurality is contrary neither to the few (instead, the much is contrary to it, as plurality that exceeds is to plurality that is exceeded) nor in all ways to the one. One way, however, in which they are contrary, as was said, is because a plurality is divisible, while the one is indivisible, but in another way they are relative, just as scientific knowledge is to the scientifically knowable, if a plurality is a number and the one a measure.

439. P_1 has a deficiency (unconditionally) if and only if there is no plurality P_x such that P_x is a smaller many (has fewer members) than P_1.
440. B1 DK.
441. Reading τοῖς πολλοῖς.
442. 5.15.
443. *Cat.* 7^{b}22–33.

10.7
Contraries and Intermediates

Since contraries admit of an intermediate and in some cases there is one, intermediates must be composed of the contraries. For all intermediates are in the same kind as what they are intermediates of. For we say that those things are intermediates into which what changes must change earlier—for example, if one proceeds from the highest string to the lowest by the smallest intervals, one will come earlier to the intermediate notes, and, in colors, if one proceeds from white to black, one will come earlier to purple or gray than to black, and similarly in the other cases. But to change from one kind to another kind is not possible except coincidentally, as from a color to a shape.[444] Therefore, it is necessary for the intermediates to be in the same kind both as each other and as what they are intermediates of.

But surely all intermediates are between opposites of some sort; for they can intrinsically change from these alone (which is why it is impossible to be intermediate between non-opposites; for otherwise there would be change that was not from opposites). But of opposites, contradictories admit of no intermediate (for this is what a contradiction is, an antithesis one or the other side of which must be present in anything whatever, not having any intermediate), and of the other opposites, some are relative, others a privation, others contrary. Among relatives, those that are not contraries do not have intermediates. The cause of this is that they are not in the same kind. For what could be intermediate between scientific knowledge and scientifically knowable? But between large and small, there is one.

If intermediates are in the same kind, as has been proved, and are intermediates of contraries, they must be composed of these contraries. For either there will be a kind of them or there will be none. And if there is to be a kind in such a way as to be something prior to the contraries, the differences that made the contrary forms as forms of a kind will be contraries that are prior to these; for the forms are composed of the kind and the differences (for example, if white and black are contraries, and one is a dilating color and the other a contracting color,[445] these differences—dilating and contracting—are prior, so that these are contraries of each other that are prior). But then the forms that are differentiated in contrary ways, at any rate, will be contraries to a higher degree. And the other forms, the intermediates, will be composed of their kind and their differences (for example, all colors that are intermediate between white and black must be said to be composed of the kind—and the kind is color—and of certain differences; but these differences will not be the primary contraries; otherwise every color will be either white or black; therefore, they must be distinct ones; therefore, they will be intermediate between the primary contraries, and the primary [contrary] differences are dilating and contracting).

444. As when a red thing becomes round.
445. The reference is to Plato's theory (*Timaeus* 67d–e).

So it is with regard to these contraries that are not within a kind that one must first inquire about what their intermediates are composed of (for things that are in the same kind must be composed of things of which the kind is not a component, or else must be incomposite). Contraries are not composed of each other, then, so they are starting-points, while the intermediates are either all incomposite, or none are. But from the contraries something comes to be, and so there will be change into it before there is one into them; for there will be less of the one in it and more of the other. Therefore, it too will be intermediate between the contraries. And therefore all the other contraries will be composites; for what is more-of-this and less-of-that is a composite in some way of those things that it is said to be in the one case more of and in the other less of. And since there are no other things of the same kind that are prior to the contraries, all the intermediates must be composed of the contraries, so that all the things downstream too, both the contraries and the intermediates, will be composed of the primary contraries.

It is clear, then, that the intermediates are all in the same kind, intermediate between contraries, and all composed of the contraries.

10.8
Distinctness in Form

What is distinct in form is distinct from something, in something, and this latter thing must belong to both—for example, if one animal is distinct in form [from another], both are animals. Therefore, [two] things that are distinct in form must be in the same kind; for this is the sort of thing I call a "kind," that by reference to which both things are said to be one and the same, and that is not coincidentally differentiated, whether as matter or otherwise. For not only must the common thing belong to them (for example, that both be animals) but also this thing, the animal itself, must be distinct in each of the two (for example, in the one case, horse, in the other, human), which is why this, the common thing, must be reciprocally distinct in form. Intrinsically, then, they will be, in the one case, such-and-such sort of animal, in the other, so-and-so sort—for example, in the one case, horse, in the other, human. Therefore, this difference must be a distinctness belonging to the kind. For by "difference belonging to the kind" I mean a distinctness that makes the kind itself distinct.

This difference, therefore, will be a contrariety (as is also clear from induction); for all things are divided by opposites, and it has been proved[446] that contraries are in the same kind; for contrariety was seen to be complete difference, and all difference in form is difference from something, in something, so that this latter thing is the same for both and is their kind (which is also why all contraries that are different in form

446. 10.4.

and not in kind are in the same column of predication and are most distinct from each other—for the difference is a complete one—and do not come to be at the same time as each other). Therefore, the difference is a contrariety.

This, therefore, is what it is for things to be distinct in form, to have a contrariety while being in the same kind, and to be indivisible (while those things are the same in form that do not have a contrariety and are indivisible); for contrarieties arise in the process of division even in the intermediates before one comes to the indivisibles. So it is apparent that in relation to what is called the "kind" none of the forms as forms of a kind is the same as it in form or distinct from it in form, and this is as it should be; for the matter is indicated by negation, and the kind is the matter of what it is said to be the kind of—not as in the Heraclidae kind[447] but as in the kind that is included in the nature of that thing. And neither is any of them so with reference to things that are not in the same kind, but will instead differ from them in kind and differ in form from those in the same kind; for the difference belonging to what differs in form must be a contrariety; and this belongs only to things in the same kind.

10.9
The Case of Female and Male

One might raise a puzzle as to why a woman does not differ in form from a man, when female and male are contrary and their difference is a contrariety, and why a female and a male animal are not distinct in form either, and yet this difference belongs intrinsically to the animal, and not as paleness or darkness does, but rather it is insofar as it is animal that both female and male belong to it.

This puzzle is pretty much the same as the other one, namely, why one contrariety makes things distinct in form and another does not—for example, the footed and the winged do, while paleness and darkness do not. Or is it that the former are affections that properly belong to the kind, while the latter are less so? Or is it that, since one component is the account and the other the matter, contrarieties that are in the account produce a difference in form, but those that are in the combination with the matter do not produce one? That is why a human's paleness or darkness does not produce a difference in form, nor is there a difference as regards form between the pale human and the dark human, not even if a single name is assigned to them. For it is as matter that the human is considered here, and matter does not produce a difference; for the [particular] humans are not forms of human because of it, and yet the parcels of flesh and the bones of which this human and that one consist are distinct. By contrast, the compound is a distinct one, but not distinct in form, because in the account there is no contrariety.

And this [form in whose account there is no contrariety] is the ultimate indivisible. Callias, by contrast, is the account with the matter; so too, then, is the pale

447. The family consisting of the descendants of Heracles.

human—because Callias is pale, and so the human is such coincidentally. Neither, then, do a brazen circle and a wooden one differ in form; nor do a brazen triangle and a wooden circle do so because of the matter, but because there is a contrariety present in the account.

But does the matter, when it is in a certain way distinct, not make things distinct in form, or is there a way in which it does? For why is this horse distinct in form from this human, and yet the accounts of them are together with the matter? Or is it that there is a contrariety present in the account? For there is also a contrariety between the pale human and the dark horse, and one in form indeed, but not insofar as one is pale and the other dark, since even if both had been pale, they would have been distinct in form nonetheless.

Male and female, however, are affections that do properly belong to the animal, not in virtue of its substance but in the matter—that is, the body. That is why the same seed becomes female or male when it is affected in regard to a certain affection.

What it is to be distinct in form, then, and why some things differ in form, while others do not, has now been stated.

10.10
Things Capable and Things Incapable of Passing Away Must Be Distinct in Kind

Since contraries are distinct in form, and the capable of passing away and the incapable of passing away are contraries (for a privation is a definite incapacity), the capable of passing away and the incapable of passing away must be distinct in kind.

Up to now we have been speaking of the universal names themselves, so that perhaps it might seem not to be necessary for whatever is incapable of passing away and whatever is capable of passing away to be distinct in form, just as with pale and dark (for the same thing can be both, and, at the same time, if it is a universal, just as the human can be both pale and dark, and, if it is a particular, it can still be both; for the same human can also (but not at the same time) be pale and dark, and yet the pale is contrary to the dark).

But then while some contraries belong to certain things coincidentally (for example, both those just mentioned and many others), others are incapable of it, among them the capable of passing away and the incapable of passing away; for nothing is coincidentally capable of passing away; for the coincidental admits of not belonging to something, while the capable of passing away is among the things that belong of necessity to what they belong to—or else one and the same thing will be capable of passing away and incapable of passing away, if the capable of passing away admitted of not belonging to it. Therefore, the capable of passing away must either be the substance or be in the substance of each thing capable of passing away. And the argument is the same in the case of things incapable of passing away; for both are affections that belong to something of necessity. Therefore, insofar as, and with reference to the primary thing

[due to which] one thing is capable of passing away and another incapable of passing away, they have an antithesis, so that it is necessary for them to be distinct in kind.

It is evident, therefore, that there cannot be Forms of the sort some people say there are; for then it would be the case that one man is capable of passing away and another incapable of passing away.[448] And yet the Forms are said to be the same in form with the particulars and not merely to have the same name. But things that are distinct in kind are further apart than those that are distinct in form.

BOOK 11 (KAPPA)[449]

11.1
Puzzles from 3.1 Revisited ($P_{1–8}$)

It is clear from our first discussions,[450] in which we went through the puzzles related to other thinkers' statements about the starting-points, that theoretical wisdom is a sort of science concerned with starting-points. [P_1] But one might raise a puzzle as to whether theoretical wisdom should be supposed to be one science or many; for if it is one, one science is always of contraries, but the starting-points are not contraries; but if it is not one, of what sort should one assume these to be?

[P_2] Further, is it for one science or for more than one to get a theoretical grasp on the starting-points of demonstrations? For if for one, why of this science rather than of any other? But if for more than one, of what sort must these be assumed to be?

[P_3] Further, is it of all substances or not? For if not of all, it is difficult to say of which. But if there is one science of all, it is unclear how it is possible for the same science to be of more than one.

[P_4] Further, is it concerned with substances alone or also with their [intrinsic] coincidents? For if in the case of the [intrinsic] coincidents, there is demonstration, in the case of the substances, there is not. But if the sciences of the two are different, what science is each of the two, and which one is theoretical wisdom? For insofar as[451] it is demonstrative, the science concerned with the [intrinsic] coincidents[452] is theoretical wisdom, while insofar as it is concerned with the primary things, it is

448. I.e., the man-itself.

449. This book is not unambiguously referred to in any other book of the *Metaphysics* but refers to the contents of 1.3–10 and, though less certainly, to those of 12.6–7. It consists of two quite different parts: (1) 1059ᵃ18–1065ᵃ26 contains a shorter version of the contents of Books 3, 4, and 6. (2) 1065ᵃ26–1069ᵃ14 contains a series of extracts taken almost verbatim from Books 2, 3, and 5 of the *Physics*. The two parts are joined together by a transition from a discussion of the coincidental to a discussion of chance.

450. 1.3–10.

451. Reading ᾗ . . . ᾗ.

452. Reading ἀποδεικτική, σοφία ἡ περὶ τὰ συμβεβηκότα.

the science of substances. But one must not assume, either, that the science being inquired about is concerned with the causes mentioned in our studies concerning nature; for it is not concerned with the for-the-sake-of-which (for the good is a thing of this sort, and it belongs among the things doable in action and the beings involved in movement). And this is what first moves things (for the end is a thing of this sort), but in the case of immovable things there is no thing that moved them first.

[P_{5a}] And, in general, there is a puzzle as to whether the science now being inquired about is really concerned with the perceptible substances or not with them but with certain others. For if it is concerned with others, it must be concerned with the Forms or concerned with the objects of mathematics.

[P_6] That the Forms do not exist is clear. Nonetheless,[453] there is a puzzle—even if someone posits that they do exist—as to why precisely what holds in the case of the other things of which there are Forms does not hold in precisely the same way in the case of the objects of mathematics. I mean that these thinkers posit the objects of mathematics as intermediate between Forms and perceptibles as a third sort of thing beyond both the Forms and the things here, but there is not a third human or horse beyond both the thing-itself and the particulars. But if it is not as they say, what must one posit as the sort of thing that the mathematician busies himself with? For it is certainly not with the things here; for none of these is the sort of thing that the mathematical sciences inquire about. [P_{5b}] But the science being inquired about is not concerned with the objects of mathematics either (for none of them is separable), nor about the perceptible substances; for they are capable of passing away.[454]

[P_7][455] In general, one might raise a puzzle about what sort of science it does belong to to go through puzzles about the matter of the objects of mathematics. For it does not belong to natural science, because the natural scientist's entire study is concerned with things that have within themselves a starting-point of movement and of rest, nor yet to the science that investigates demonstration and scientific knowledge; for this is the kind of thing that it produces its investigation about. It remains, therefore, that it is the philosophy proposed here that conducts the investigation into those issues.[456]

[P_8] One might raise a puzzle too about whether one should posit that the science being inquired about is concerned with the starting-points, those that some people call "elements," which everyone posits as components of composite things. But it might seem that the science being inquired about must rather be of universals; for every account and every science is of universals and not of last things,[457] so that it would thus be of the primary kinds.[458] But these would turn out to be being and one; for these might most of all be supposed to encompass all the beings and to be most

453. Reading ὅμως.
454. 1025^{b}18–1026^{a}32.
455. No parallel in Book 3.
456. 1026^{a}18–32.
457. I.e., particulars.
458. I.e., the categories.

like starting-points due to being primary in nature; for when they pass away, the rest are done away with along with them; for everything is a being and is one. But insofar as, if one posits these as kinds, their differences must participate in them, while no difference participates in its kind, in this way it would seem that one should not posit them as kinds or as starting-points.

Further, if what is simpler is more of a starting-point than what is less so, and the ultimate things of which the kind is composed are simpler than the kinds (for the former are indivisible, while the kinds are divided into many different forms), the forms would seem to be starting-points more than the kinds. But insofar as the forms are done away along with the kinds, the kinds seem more like starting-points; for something that does away with something along with itself is its starting-point.

1060ᵃ1 The things that involve puzzles, then, are these and others of the sort.

11.2
More Puzzles from 3.1 Revisited ($P_{9–16}$)

[P_9] Further, should one posit something beyond the particulars or not, or is it rather these particulars that the science being inquired about is the science of? But they are unlimited in number. Yet the things that are beyond the particulars are kinds and forms, while the science we are now inquiring about is of neither of these. Why this is impossible has been stated.[459]

[P_{10}] For in fact there is, in general, a puzzle as to whether one should suppose that there is some separate substance beyond the perceptible substances (that is, those here), or not, but rather that these are the beings and that theoretical wisdom is concerned with them. For we seem to be inquiring about another sort of substance, and that this is what we proposed to ourselves here[460]—I mean, to see whether there is something intrinsically separable that belongs to none of the perceptibles.

Further, if beyond the perceptible substances there is some other substance, which sorts of perceptibles should one posit this to be beyond? For why is it more so beyond the humans or the horses that one should posit this than beyond the other animals or even the inanimate things generally? But to set up other eternal substances equal in number to the perceptible ones that are capable of passing away would seem to fall outside the bounds of what is reasonable.

But if the starting-point now being inquired about is not separable from the bodies, what other starting-point could one better posit it to be than matter? But this does not exist actively but potentially.[461] And the form and the shape would seem to be a more controlling starting-point than matter. The form, though, is capable of passing away, so that there is no eternal substance at all that is separable and intrinsic. But this

459. 1059ᵇ31–38.
460. 1059ᵇ20–21.
461. 1042ᵃ27–28, 1048ᵃ35–ᵇ9.

is absurd; for there seems to be such a thing, and it is inquired about by pretty much all the most sophisticated thinkers as being a starting-point and substance of this sort; for how will there be order without there being something eternal and separable and enduring?[462]

[P_{11}] Further, if indeed there is a substance and starting-point of the sort of nature that we are now inquiring about, and if this is one for all things, and the same for both eternal things and things capable of passing away, there is a puzzle as to why precisely, if the starting-point is the same, some of the things that fall under the starting-point are eternal, while others are not eternal (for this is absurd). But if there is one starting-point of the things that are capable of passing away and another of the eternal things, and if that of the things that are capable of passing away is also eternal, we will face a similar puzzle (for why, if the starting-point is eternal, are the things that fall under the starting-point not also eternal?); but if it is capable of passing away, there will be some other starting-point of this starting-point, and another of that one, and this will go on without limit.

[P_{12}] Again, if one is to posit [as starting-points] those that seem most of all to be immovable starting-points, namely, being and one, then, first, if each of these does not signify a this something and substance, how will they be separable and intrinsic? **1060^{b}1** But these are the sorts of eternal and primary starting-points that we are inquiring about. But if each of the two does indicate a this something and a substance, all the beings will be substances; for being is predicated of all things (as of some things one is as well). But that every being is a substance is false. Further, in the case of those who say that the primary starting-point is the one, and that this is substance, and who from the one and the matter generate, in the first place, number, and say that this is substance, how can what they say possibly be true? For how is one supposed to understand the two and each of the rest of the composite numbers as one? About this they say nothing, nor is it easy to say anything.

[P_{13}] But if one is to posit lines or the things that come after them (I mean the primary surfaces[463]) as starting-points, these at least are not separable substances, but cuts and divisions, some of surfaces, others of bodies (while points are cuts or divisions of lines), and further, limits of these same things. But all these are present in other things, and none is separable. Further, how should one suppose there to be a substance of one and of point? For there is a coming to be of every substance, but there is no coming to be of a point; for a point is a division.

[P_{14}] A puzzle is also raised by the fact that every science is of the universals and of the such-and-such sort of thing, but the substance is not among the universals, but is rather a this something and separable, so that if there is a science that is concerned with the starting-points, how should one suppose the starting-point to be substance?

462. 1075^{b}24–27.
463. *DA* 404^{b}19–21.

[P15] Further, is there anything beyond the compound or not (I mean, the matter and what is with it[464])? For if not, things that are in matter are all capable of passing away. But if there is something, it would be the form and the shape. In which cases this is beyond the compound, however, and in which it is not, is difficult to determine. For in some cases it is clear that the form is not separable—for example, that of a house.

[P16] Further, are the starting-points the same in form or number? For if they are so in number, all things will be the same.

11.3
4.1–2 Revisited

Since the science of the philosopher is of being qua being universally and not in part, and since things are said to *be* in many ways, not in one, it follows that if they are said to *be* homonymously and with reference to nothing common, they do not fall under one science (for there is no kind of such things), while if it is with reference to something common, they will fall under one science.

It certainly seems that things are said to *be* in the way mentioned, like medical and healthy; for we also say that things are said to *be* each of these in many ways. **1061ᵃ1** And each thing is said to *be* so in the relevant way—in the one case with some sort of reference to the science of medicine, in the other to health, in others to other things, but in each case to the same thing. For an account and a knife are said to be medical because the former comes from the science of medicine and the latter is useful to it. It is the same way with healthy; for one thing is said to be such because it is indicative of health, another because it is productive of it. And it is the same way too in the rest of the cases.

It is in this way, then, that everything is also said to *be*; for each of them is said to *be* because it is an affection of being qua being, or a state, disposition, or movement of it, or something else of this sort. And since every being is referred to something that is one and common, each of the contrarieties too will be referred to the primary differences and contrarieties of being, whether the primary differences of being are the many and the one or similarity and dissimilarity, or some other differences. Let these be taken as already theoretically grasped. And it makes no difference whether what is is referred to being or referred to one. For even if these are not the same but distinct, they are convertible, at any rate; for what is one is in a way also a being, and what is a being, one.

But since every pair of contraries is to be theoretically grasped by one and the same science, and in each pair one member is said of things with reference to the privation of the other (and yet in the case of some contraries one might raise a puzzle

464. 1058ᵇ10–11.

as to how they can be said of things with reference to a privation, those that have an intermediate, like just and unjust), in all such cases, therefore, one must posit that the privation is not of the whole account but of the complete form. For example, if the just man is, in accord with a state [of character], obedient to the laws, the unjust one will not in every case be the one who is deprived of the whole account, but may be merely in some respect deficient in obedience to the laws, and it is in this respect that the privation will belong to him, and it is the same way in other cases.

But just as the mathematician makes his theoretical investigation about things that result from abstraction (for he gets his theoretical grasp on them having first stripped away all the perceptible affections—for example, weight and lightness, hardness and its contrary, and further, also heat and cold, and the other perceptible contrarieties—and leaves behind only the quantitative and the continuous, sometimes in one, sometimes in two, sometimes in three dimensions, and the affections of things insofar as they are quantitative and continuous, and does not get a theoretical grasp on any other aspect of them, but investigates the relative positions of some and what belongs to them, and the commensurabilities and incommensurabilities of others, and the ratios of others still, but nonetheless we posit one and the same science of all of these: geometry), it is the same way too with being. For to get a theoretical grasp on the [intrinsic] coincidents of this qua being, and on the contrarieties that belong to it qua being, belongs to no other science than philosophy. For to natural science one would assign the task of producing theoretical knowledge not of the beings qua beings, but qua having a share in movement. But dialectic and sophistry, although they are concerned with the coincidents of things, are not concerned with them qua beings, or with being itself qua being. So it remains that it is the philosopher who is capable of theorizing about the things mentioned qua being.

But since everything is said to *be* with reference to something that is one and common, although so said in many ways, and contraries are in the same position (for they are referred to the primary contrarieties and differences in being), and since things of this sort can fall under one science, the puzzle stated at the start[465] would seem to be resolved—I mean the puzzle as to how there can be one single science of beings that are many and different in kind.

11.4
Parts of 4.3 Revisited

Since even the mathematician makes a special use of the common things,[466] it must belong to primary philosophy to get a theoretical grasp on these starting-points also. For that when equals are subtracted from equals the remainders are equal is common

465. $1059^{a}20–23$.

466. I.e., beliefs or axioms common to all or to many sciences. See $996^{b}26–997^{a}11$.

to all quantities, but mathematics, having cut off a part of its proper [subject-]matter, proceeds to produce theoretical knowledge about this part (for example, about lines or angles or numbers or some other sort of quantity)—not, however, qua beings, but insofar as each of them is continuous in one, two, or three dimensions. But philosophy does not investigate beings in part, or insofar as each of them has some coincident, but it investigates being, and each thing of that previous sort qua being.

Natural science too has the same way of inquiring as mathematics; for natural science gets a theoretical grasp on the [intrinsic] coincidents and starting-points of the beings insofar as they are moving and not qua beings (while the primary science, we said, is concerned with these, only insofar as the underlying subjects are beings, and not insofar as they are anything else). That is why both this science and mathematical science must be assumed to be parts of theoretical wisdom.

11.5
Parts of 4.3 Revisited

There is a starting-point in the beings that one cannot be deceived about, but must always be doing the opposite, I mean, be grasping the truth—that the same thing cannot at one and the same time be and not be, or admit of any other opposites in this way. And while there is no unconditional demonstration of such things, against a given person there is one; for it is not possible to produce a deduction of this from a more persuasive starting-point, and yet we, at any rate, must do so, if indeed one is to demonstrate it unconditionally. But to prove to the person who makes opposite affirmations that he speaks falsely, one must get the sort of thing from him that will be the same as that it is not possible for the same thing to be and not to be at the same time, but that will not seem to be the same; for only in that way can a demonstration be given to the person who states that opposite affirmations can be truly made about the same thing.

Those, then, who are going to join in argument with each other must to some extent comprehend each other; for if this does not happen how will there be a joining in argument with each other for these people? Therefore, each of the names must be known and must make something clear, and not many things, but only one. And if the name signifies more than one thing, it must be made evident to which one of them it is being applied.

[A_1] The person, then, who says it is this and it is not this, says and denies that it is this, so that what the name signifies, he says it does not signify; and this is impossible. And so, if indeed "it is this" signifies something, it is impossible for its contradictory to be true of the same thing.

[A_2] Further, if the name signifies something and this states the truth, it must be that this is so of necessity. And what is so of necessity cannot for the relevant time not

be so. Therefore, it is not possible for opposite affirmations to state the truth about the same thing.

[A_{3a}] Further, if the affirmation no more states the truth than the negation, the person who says [it is] a human no more states the truth than the one who says [it is] not a human. And yet it would also seem that in saying that a human is not a horse, a person would be stating the truth either more or less than in saying that [it is not] a human, so that he will also be stating the truth in saying that the same thing is a horse (for the assumption was that opposite affirmations equally state the truth). It follows, therefore, that the same thing is a human, a horse, or any other animal.

None of these is an unconditional demonstration; nonetheless, it is a demonstration to someone who posits the relevant things. And maybe if one had questioned Heraclitus himself in this way one would have compelled him to agree that opposite affirmations can never state the truth about the same things. But as things stand, he took up this belief without himself hearing what he was saying.[467]

[A_{3b}] In any case, if what is said by him is true, not even this itself will be true—I mean, that it is possible for the same thing at one and the same time to be and also not to be; for just as, when separated, the affirmation no more states the truth than the negation, so in the same way—because the combined and complex affirmation is like a single affirmation—the negation will no more state the truth than the whole taken as an affirmation.

[A_4] Further, if nothing can be affirmed truly, this will itself be false: the affirmation that there can be no true affirmation. But if there is a true affirmation, this would refute what is said by those who object to such things and utterly do away with discussion.

11.6
Parts of 4.4–5 Revisited

The saying of Protagoras is much the same as the views mentioned;[468] for he in fact said that man is the measure of all things, which is saying nothing other than that what seems so to each person also assuredly is. But if this is so, it follows that the same thing both is and is not, and is both bad and good, and all the other things that are said in accord with opposite affirmations, because often a given thing appears beautiful to some people and the contrary to others, and what appears to each is the measure.

This puzzle may be resolved by getting a theoretical grasp on where the starting-point of this supposition has come from; for in some cases it seems to have come about from the belief of the natural scientists, and in others from the fact that not

467. $1005^{b}23–26$.
468. $1009^{a}6–16$.

all people have the same knowledge about the same things, but rather a given thing appears pleasant to some and the contrary to others.

It is a belief common to pretty much all those concerned with nature that nothing comes to be from what is not, but everything from what is. Since, then, nothing white comes to be from what is completely white (that is, what is in no way not white), what becomes white must come to be from what is not white, so that it must come to be from what is not, according to them, unless the same thing was white and not white at the start. It is not difficult to resolve this puzzle; for it was said in our studies concerning nature[469] how things that come to be do so from what is not and how they do so from what is.

But to attend equally to the beliefs of, and the ways things appear to, the disputing parties is simple-minded; for it is clear that one of them must be deceived. This is evident from what happens as regards perception; for the same thing never appears sweet to some people and the contrary to others, unless in one case the perceptual organ for discerning the flavors mentioned is destroyed or injured. And if this is so, the other must be supposed to be the measure and the one must not be supposed to be the measure. And I say the same in the case of good and bad, beautiful and ugly, and other things of this sort. For maintaining the other view is no different from maintaining that what appears to people who press their finger below their eye and make a thing appear to be two instead of one must be two,[470] because it appears to be so, and again one; for to those who do not interfere with their sight the one thing appears to be one.

In general, it is absurd for the fact that the things here are manifestly changing and never remain the same to be made the basis of judgment about the truth; for it is the things that are always in the same state and never undergo change that should be made the basis when pursuing the truth, and this is the sort of thing that the heavenly bodies are; for these are manifestly not now of such-and-such a sort and again of another sort, but are always the same and share in no change.

Further, if there is movement, there is also something moved, and everything is moved from something to something. Therefore, what is moved must first be in that from which it is moved and then not be in it, and must move to the other and come to be in it, and the contradictories must not be true of it at the same time, as our opponents claim they are.

And if with respect to quantity the things here continuously flow and move (that is, if one were to posit this even though it is not true), why should they not remain the same with respect to quality? For the predication of contradictories of the same thing seems to have come about largely from the supposition that quantity does not remain the same in the case of bodies, which is why our opponents say that the same

469. *Ph.* 1.6–9, *GC* 317b14–319b5.
470. *Insomn.* 461b31–462a2.

thing both is and is not four cubits long. But the substance depends on quality, and this is of a definite nature, while quantity is of an indefinite one.

Further, when the doctor prescribes the taking of this food [on the assumption that it is bread] why do they take it? For in what way is it bread rather than not bread? And so it should make no difference whether they eat it or do not eat it. But in fact, supposing themselves to know the truth about it and it to be the food prescribed, they take the food. And yet there was no necessity to do so, if no nature assuredly remains the same in perceptible things, but all of them are always moving and flowing.

Further, if we are always altering and never remain the same, is it any wonder that to us, as to the sick, things never appear the same? For to them too, because their state is not in the same condition as when they were healthy, perceptible things do not **$1063^{b}1$** appear the same. And yet this certainly does not make the perceptible things themselves share in any change, though they do produce different perceptual affections in the sick and not the same ones. For it to be the same way, then, with us too, if the change mentioned occurs, is equally necessary. But if we do not change but continue as we were, there will be something that remains the same.

In the case of those who raise the puzzles mentioned on the basis of argument, it is not easy to provide a resolution, unless they posit something for which they no longer demand an argument; for it is in this way that all argument and all demonstration comes about; for if they posit nothing, they do away with discussion and with argument in general. So with people of this sort there is no arguing. But in the case of those who are puzzled by the traditional puzzles, it is easy to confront and resolve what causes the puzzles in them—as is clear from what has been said.[471]

So it is evident from these considerations that opposite affirmations cannot state the truth about the same thing at one time, nor can contrary ones, because all contraries are said of things as a privation—as is clear if we lead the account of contraries back to their starting-point.

Similarly, nothing intermediate between contraries can be predicated of one and the same thing [as one of the contraries]; for if the underlying subject is white, in saying that it is neither black nor white, we will be stating a falsehood; for then it follows that it is white and not white; for the second of the two things that have been combined is truly stated of it, and this one is the contradictory of white.

Neither, then, in speaking in accord with Heraclitus[472] or in accord with Anaxagoras[473] is it possible to speak the truth; if it were, it would follow that contraries are predicable of the same thing; for when Anaxagoras says that there is a part of everything in everything, he is saying that nothing is sweet any more than it is bitter, and similarly for the other sorts of contraries, if indeed everything is present in everything, not potentially only but actively and separately.

471. $1062^{b}20$–$1063^{a}10$.
472. $1062^{a}31$–$^{b}7$.
473. $1063^{b}26$–30.

Similarly, all affirmations cannot be false nor all true, both because of many other difficulties that might be assembled as being due to this thesis and because, if all are false, it will not be true to state even it, while, if all are true, it will not be false to state that all are false.

11.7
6.1 Revisited

Every science inquires about certain starting-points and causes for each of the things of which it is the science—for example, medicine and athletic training and each of
1064a1 the rest of the sciences whether productive or mathematical. For each of these marks off a certain kind and busies itself with it, as something that exists and is a being, although not qua being; instead, the science that does this is another science that is beyond the former ones. And each of the sciences just mentioned somehow gets hold of the what-it-is in each kind and tries to prove the rest in a weaker or more exact way. Some get hold of the what-it-is through perception, others by hypothesizing it, which is why it is clear from an induction of this sort that there is no demonstration of the substance or the what-it-is.

However, since there is a science concerned with nature, it is clear that it must be distinct both from practical and from productive science. For in the case of productive science the starting-point of movement is in the producer and not in the product, and is either a craft or some other sort of capacity. Similarly, in practical science too the movement is not in the action done but in the doer of the action.[474] But the natural scientist is concerned with things that have within themselves a starting-point of movement. It is clear from these considerations, therefore, that natural science is neither practical nor productive but theoretical (for it must fall in some one of these kinds). And since each of the sciences must somehow know the what-it-is and use it as a starting-point, one must not fail to notice the way the natural scientist must define things and the way he must get hold of the account of the substance—whether like snub or like concave. For of these the account of the snub is said together with the matter of the thing, while that of the concave is said separate from the matter; for it is in a nose that the snubness occurs, which is why the account of it is theoretically grasped together with this; for the snub is concave nose. It is evident, then, that the account of flesh too and of the eye and of the other parts must always be given together with the matter.

Since there is a science of being qua being and separable, it must be investigated whether this must be assumed to be the same as natural science or rather as distinct from it. Natural science is concerned with things that have a starting-point of movement within themselves, while mathematics is theoretical and is a science of things that

474. 1050a34–b3.

remain the same, but are not separable. Concerning things that are separable, therefore, and immovable, there is a science distinct from both of these—if indeed there is some substance of this sort (I mean separable and immovable), which is precisely what we will try to prove.[475] And if indeed there is a nature of this sort among the beings, there is where the divine too would surely be, and this would be the primary and most controlling starting-point. Therefore, it is clear that there are three kinds of theoretical sciences—natural, mathematical, and theological. The best kind of science, then, is that of the theoretical sciences, and of these themselves the last named one; for it is concerned with the most estimable of the beings, and each science is said to be better or worse in accord with the scientifically knowable object that properly belongs to it.

One might raise a puzzle, however, as to whether or not the science of being qua being should be posited as universal at all. For each of the mathematical sciences is concerned with some one definite kind, while universal mathematics is common, concerned with all alike. If, then, the natural substances are primary among the beings, natural science will also be primary among the sciences, but if there is another nature and substance, separable and immovable, the science of it must be distinct from and prior to natural science, and universal by being prior.

11.8
6.2–4 Revisited

Since there are several ways in which something is said to *be* unconditionally, of which one is being said to *be* coincidentally, what it is to be in this way must first be investigated. But that none of the traditional sciences busies itself with the coincidental is clear; for building does not investigate what coincidentally happens to those who will use the house (for example, whether they will live painfully in it or in the contrary way), and weaving, or shoemaking, or gourmet cooking does not [investigate such things] either. Instead, each of these sciences investigates what is intrinsically special to it, and this is the end that properly belongs to it. And as for the argument that when the person who is musical becomes grammatical[476] he will become both at the same time, not having been both before, and that what is, not always having been, must have come to be, so that he must at the same time have become musical and grammatical—that none of the agreed on sciences inquires about except sophistic; for it alone busies itself with the coincidental. That is why Plato was not wrong when he used to say[477] that the sophist spends his time on what is not.

But that it is not even possible for there to be a science of the coincidental will be evident if we try to see what the coincidental really is. We say, then, that everything either is always and of necessity (not in the sense in which something is said to be

475. 12.6–7.
476. Secluding οὐδὲ μουσικὸν καὶ γραμματικόν.
477. E.g., *Sophist* 254a.

forced, but in that which we employ in connection with demonstrations), or is for
35 the most part, or is neither for the most part nor always and of necessity, but as luck would have it—for example, there might be cold weather in the dog days, but this occurs neither always and of necessity nor for the most part, but it might occur
1065ᵃ1 sometimes. The coincidental, then, is what occurs, but neither always nor of necessity nor for the most part. What the coincidental is, then, has been stated, and why there is no science of such a thing is clear; for every science is of what always or for the most
5 part is, but what is coincidental is included in neither of these.

And that there are not causes and starting-points of the coincidental of the same sort as there are of the intrinsic is clear; for if there were, everything would be of necessity. For if A is when B is, and B is when C is, and if C is, not as luck would
10 have it, but of necessity, what C was cause of will be of necessity, down to the last thing that is said to be caused (but this was supposed to be so coincidentally). So all things will be of necessity, and both what occurs as-luck-would-have-it and what admits of coming to be and of not doing so will be entirely eliminated from the things that come to be. And if one supposes the cause not to exist already but to be coming to be, the same results will follow; for everything will come to be of
15 necessity. For tomorrow's eclipse will occur if A occurs, and A if B occurs, and B if C occurs; and in this way, if one keeps on subtracting time from the finite time between now and tomorrow, one will come at some time to what already exists,
20 so that since this exists, everything after it will occur of necessity, so that all things occur of necessity.

As for being as being true[478] and being coincidentally, the former depends on a combination in thought and is an affection of thought (which is why the starting-points of this way of being are not inquired about, but about being that is external[479] and separable), while the latter is not necessary but indefinite
25 (I mean, the coincidental), and of something like that the causes are unordered and unlimited.

The for-the-sake-of-which is found in things that come about by nature or as a result of thought, and it is luck when one of these things comes about coincidentally; for just as being is either intrinsic or coincidental, it holds likewise for
30 cause. And luck is a coincidental cause in things that come about in accord with deliberate choice for the sake of an end, which is why luck and deliberate choice are concerned with the same things, for deliberate choice does not exist separate from thought. The causes from which things due to luck might come about are indefinite, which is why luck is unclear to human rational calculation and a cause coincidentally, and is not unconditionally a cause of anything. It is good or bad
35 luck when the result is good or bad, and is good or bad fortune when these are of
1065ᵇ1 a certain magnitude.

478. 6.4.
479. I.e., to the mind. Cf. 1028ᵃ2.

Since nothing coincidental is prior to the intrinsic, coincidental causes are not either. Therefore, if luck or chance is a cause of the heaven, understanding and nature are causes prior to it.

11.9
Parts of Physics *3 Recapitulated: Movement*

Some things *are* actively only, some potentially, some potentially and actively—in one case being a this something, in another a quantity, or one of the rest. There is no movement beyond the things [that are being moved]; for change is always in accord with the categories of being, and there is nothing that is common to these and in no one category. But each of the categories belongs to all its members in two ways. For example, the this—one is the shape, the other its privation; as regards quality—one is white, the other black; as regards quantity—one is complete, the other incomplete; and as regards spatial movement—one is up, the other down, or one is [of what is] light, the other [of what is] heavy. So there are as many forms of movement and change as there are of being.[480]

Since there is a division in each kind between what is potential and what is actual, the activation of what is potential, insofar as it is such, is what I say movement is. And that what we say is true is clear from the following; for when the buildable, insofar as it is what we say it is, is active, it is being built, and this is building. It is the same way with learning, curing, walking, leaping, aging, and ripening. Movement exists when the actuality itself does, and neither earlier nor later. The actualization, then, of what is potential, when it is actually active, not insofar as it is itself but insofar as it is movable, is movement. By "insofar as," I mean this: The bronze is indeed potentially a statue, but nonetheless it is not the actualization of the bronze insofar as it is bronze that is movement. For being for bronze is not the same as being for a certain potential, since if it were unconditionally the same in account, the actualization of the bronze would be a sort of movement. But it is not the same (this is clear in the case of contraries; for to have the potential to be well and to have the potential to be sick are not the same; for if in fact they were, to be well and to be sick would be the same—the underlying subject, though, whether it is healthy or diseased, whether it is liquid or blood, is one and the same). And since it is not the same, just as color and the visible are not the same either, it is of the potential, insofar as it is potential, that the actuality is movement.

It is clear, then, that movement is this, and that it exists when the actuality itself does, and neither earlier nor later. For each thing [of this sort] admits of sometimes being active, sometimes not—for example, the buildable insofar as it is buildable. **1066^{a}1**

480. More exactly stated, there is change with respect to just four categories (substance, quality, quantity, place) and movement with respect to just three (quality, quantity, place). See 1068^{a}8–16.

And the activation of the buildable insofar as it is buildable is building; for the activity is either this—the building—or the house. But when the house exists it is no longer buildable, and what is buildable is what is being built. It is necessary, therefore, for building to be the activity, and building is a sort of movement. And the same account also applies in the case of the other movements.

It is clear from what others say about movement that what we have stated is correct, and from the fact that it is not easy to define it otherwise. For one cannot put it in some other kind. This is clear from what people say; for some say[481] that it is otherness or inequality or not being, none of which is necessarily being moved, and nor is change to these or from these any more than to or from their opposites. What causes people to posit it as these is that movement seems to be something indefinite, and the starting-points in one of the two columns of opposites, because they are privations, are indefinite; for none of them is either a this or a such-and-such sort or any of the rest of the categories. The cause of movement's seeming to be indefinite is that it cannot be posited either as a potentiality of the beings or as an activation of them; for neither what is potentially of a certain quantity nor what is actively of a certain quantity is of necessity moved, and while movement does seem to be a sort of activity, it is incomplete activity. But the cause of this is that the potentiality of which it is the activation is incomplete. And because of this it is difficult to grasp what movement is; for it must be posited either as a privation or as a potentiality or as an activity that is unconditionally such. But manifestly none of these is possible. So the remaining option is that it must be what was said, both an activity and not an activity in the way stated, which, though difficult to visualize, can exist.

And that movement is in the movable is clear; for movement is the actualization of the movable by what can move something. And the activation of what can move something is no other; for there must be the actualization of both; for it can move something by having the potentiality to do so, and it is moving it by being active. But it is on the movable that the mover is capable of acting, so that the activation of both alike is one, just as the interval from one to two or from two to one are the same, or as are the hill up and the hill down, although the being for them is not one. And similarly in the case of the mover and the moved.

11.10
More Parts of Physics *3 Recapitulated: The Unlimited*

The unlimited is either what cannot be traversed because it is by its nature not to be traversed (in just the way the voice is invisible), or what admits only of incomplete traverse, or scarcely admits of it, or what—though by its nature it admits of traverse or limit—is not traversed or limited. Further, something may be unlimited with

481. Plato, *Timaeus* 57e–58a.

respect to addition, to subtraction, or both. But a separable thing is something the **1066ᵇ1**
unlimited certainly cannot be; for if it is neither a magnitude nor a plurality, but the unlimited itself is substance and not a coincident, it will be indivisible (for the divisible is either magnitude or plurality), but if it is indivisible, it is not unlimited, except in the way that the voice is invisible. But this is not the way people use the 5
term nor are we inquiring about it but into the unlimited as untraversable.

Further, how is it possible for the unlimited to intrinsically exist, if number and magnitude, of which the unlimited is an affection, do not? Further, if the unlimited is a coincident, it cannot—insofar as it is unlimited—be an element of the beings, just as the invisible is not an element of speech, and yet the voice is invisible. Also, 10
it is clear that it is not possible for the unlimited to be actively so. For then any part of it that might be taken would be unlimited (for being for the unlimited and the unlimited are the same, if indeed the unlimited is a substance and not an affection of an underlying subject). So it is either indivisible or—if it is capable of having parts—is divisible into unlimiteds. But the same thing cannot be many unlimiteds 15
(for just as air is part of air, so would unlimited be of unlimited, if the unlimited is substance and starting-point). Therefore, it must be incapable of having parts and indivisible. What is actively unlimited, however, cannot be indivisible (for it must be a certain quantity). Therefore, it must belong as a coincident does. But if so, then (as was said) it cannot be it that is a starting-point, but rather that thing with which it is 20
coincident, the air or the even.[482]

This inquiry is universal, but that the unlimited is not found among perceptible things either will be clear from what follows; for if the account of body is what is bounded by planes, there cannot be any unlimited body, whether perceptible or intelligible, nor can there be a number considered as separate and unlimited; for a number or what has a number is numerable. 25

In the context of natural science, this is clear from the following considerations; for the unlimited can neither be composite nor simple. For it cannot be a composite body if the elements are limited in multiplicity (for the contraries must be equalized and no one of them must be unlimited; for if one of the two bodies falls in any way short of the other in capacity, the limited one will be destroyed by the unlimited one; 30
and that each should be unlimited is impossible, for body is what has extension in all directions, and the unlimited is the limitlessly extended, so that if the unlimited is a body, it will be unlimited in all directions).

Nor can the unlimited body be one and simple, whether, as some people say,[483] it is something beyond the elements, out of which they generate these (for there 35
is no such body beyond the elements; for everything can be resolved into what it is composed of, but manifestly not into things beyond the simple bodies), or it is fire or any of the other elements; for apart from the question of how any of them **1067ᵃ1**

482. Anaximenes (984ᵃ5); the Pythagoreans (986ᵃ15–21).
483. I.e., Anaximander.

could be unlimited, the universe, even if it is limited, cannot be or become any one of them—as Heraclitus says[484] that all things at times become fire. The same argument applies also to the one, which the natural scientists put beyond the elements; for everything changes from contrary to contrary—for example, from hot to cold.

Further, a perceptible body is somewhere, and the [proper] place of the whole and of the part is the same, as in the case of the earth. So, if the unlimited body is uniform, it will be immovable or will always be moving. But this is impossible. For why down rather than up or than anywhere else? For example, if there is a clod of earth, where will this move or be at rest? For the proper place of the body that is homogeneous with it is unlimited. Will the clod occupy the whole place, then? And how? What, then, of its rest or movement? Will it be resting everywhere? Therefore, it will not move. Or be moving everywhere? Therefore, it will not rest.

But if the universe has unlike parts, their proper places will also be unlike, and, first, the body of the universe will not be one except by contact, and, second, the parts will be either limited or unlimited in form. But limited they cannot be; for then those of one form will be unlimited and those of another will not (if the universe is unlimited)—for example, fire or water will be unlimited, but something like that will be destructive of their contraries. But if the parts are unlimited and simple, their places are also unlimited, and there will be an unlimited number of elements. But if this is impossible and the places are limited, the universe must be limited too.

In general, there can be neither an unlimited body nor an unlimited [proper] place for bodies, if every perceptible body has either weight or lightness; for it must move either toward the middle or upward, and the unlimited—either the whole or the half—cannot do either; for how can you divide it? Or how will part of the unlimited be down and part up, or part extreme and part middle? Further, every perceptible body is in a place, and there are six forms of place,[485] but these cannot exist in an unlimited body. In general, if an unlimited place is impossible, so is an unlimited body. [And the former is impossible;] for what is in a place is somewhere, and this signifies either up or down or in one of the other directions, and each of these is a sort of limit.

The unlimited is not the same in magnitude, in movement, and in time in the way that some one nature is; rather, the posterior among these is said to be unlimited with reference to the prior—as, for example, a movement is said to be unlimited with reference to the magnitude of the distance covered by an object's movement, alteration, or growth, and time because of the movement.

484. B30, B64, B66, B90 DK.

485. Up, down, left, right, front, back.

11.11
Parts of Physics *5 Recapitulated*

Among things that change, some change coincidentally, as when the musical walks, **1067ᵇ1**
and others are said to change unconditionally, because something in them changes—
for example, in respect of their parts (for the body becomes healthy, because the
eye does), and there is also something that is itself moved directly, and this is the
intrinsically movable. It is the same way in the case of the mover; for it moves some- 5
thing either coincidentally or in respect of a part of itself or intrinsically. But there is
something that directly moves a thing. And there is something that is moved, also the
time during which it is moved, and that from which and that to which it is moved.
The forms, though, and the affections and the places to which moving things are
moved are immovable—for example, scientific knowledge and heat (and it is not heat 10
that is a movement but heating).

Change that is not coincidental is not found in all things but only in contrar-
ies, intermediates, and contradictories. One may be persuaded of this by induction.
Something that changes changes either from an underlying subject to an underlying
subject, or from what is not an underlying subject to what is not an underlying 15
subject, or from an underlying subject to what is not an underlying subject, or from
what is not an underlying subject to an underlying subject (I mean by "underlying
subject" what is indicated by an affirmation), so that there must be three sorts of
changes; for there is no change from what is not an underlying subject to what is not
an underlying subject; for neither are the terms contraries nor is there any contradic- 20
tion, because there is no opposition.

A change from what is not an underlying subject to an underlying subject, the
relation being that of contradiction, is a coming to be—an unconditional coming to
be when the change is unconditional, in a particular respect when the change is in a
particular respect. A change from an underlying subject to what is not an underlying
subject is a passing away—an unconditional passing away when the change is uncon-
ditional, in a particular respect when the change is in a particular respect.

If things are said not to *be* in many ways, and neither what is not by composition 25
or by division nor what potentially is not and is opposed to what unconditionally *is*
admits of movement (for what is not white or not good can still coincidentally admit
of movement, for the not white could be human, while what is unconditionally not a
this can in no way admit of movement), what is not cannot be moved.

And if this is so, coming to be cannot be a movement either; for what is not does 30
come to be; for even if the coming to be is in the highest degree coincidental, still it
is true to say that not being belongs with what is unconditionally coming to be. For
similar reasons, what is not cannot be at rest. These difficulties follow, then, as does
this one, that if everything that is moved is in a place, and what is not is not in a place, 35
[it cannot move]; for if it did it would be somewhere. Passing away is not a movement

either, then; for the contrary of a movement is either another movement or rest, while the contrary of passing away is coming to be.

1068ᵃ1 And since every movement is a sort of change, and the sorts of changes are the three mentioned, and of these, those with respect to coming to be and passing away are not movements, and they are the changes that involve a relation of contradiction, it necessarily follows that only the change from an underlying subject to an underlying subject is movement. The underlying subjects, though, may be either contraries or intermediates (for a privation must also be regarded as a contrary), and are indicated by an affirmation—for example, the naked, toothless, or black.

11.12
More Parts of Physics *5 Recapitulated*

If the categories are distinguished as substance, quality, place, acting on or being acted on, relative, quantity, there must be three movements—of quality, of quantity, of place—but there is no movement with respect to substance, because there is nothing contrary to substance, nor of the relative (for it is possible that when one of the two relata changes the other becomes untrue, though it does not change at all, so that the movement of them is coincidental), nor of acting on and being acted on or mover and moved, because there is no movement of movement nor coming to be of coming to be, nor, in general, change of change.

For there are [just] two ways in which there might be movement of movement: either as an underlying subject (for example, as a human is moved because he changes from pale to dark, so that in this way movement too may be heated or cooled, change its place, or grow; but this is impossible; for a change is not a sort of underlying subject), or else some other underlying subject might change—for example, the human from sickness to health—from one change to some other form [of change]. But this is not possible either, except coincidentally. For every change is from something to something. Coming to be and passing awau are also like that, except that they are to things opposed in one way, while the other—movement—is to things opposed in another way.[486] A thing changes, then, at the same time from health to sickness, and from this change itself to another. It is clear, then, that if it has become sick, it will have changed to whatever the other sort of change may be (for it may remain at rest), and further, never to some random sort. And this new change will be from something to something else, so that this will be the opposite change: becoming healthy. But [we will respond that] this is by coincidence, as there is change from recollecting to forgetting, because what these belong to changes, now to scientific knowledge, now to health.[487]

486. I.e., from one contrary to another.
487. Reading ὑγίειαν.

Further, it will go on without limit, if there is to be change of a change and coming to be of a coming to be. If this is so for the later one, then, it must also be so for the earlier one. For example, if the simple coming to be was at some time coming to be, what comes to be something was also at some time coming to be. So what simply comes to be something was not yet there, but there was already something that was coming to be coming to be something. And this was at some time itself coming to be, and so it was not yet at that time coming to be something else. But since in an unlimited series there is no first term, there will be no first here either, and so neither will there be a following one. Nothing, then, can either come to be or move or change.

Further, the same thing that admits of movement also admits of the contrary movement (and of resting), and of coming to be and passing away. So what is coming to be is passing away when it has come to be coming to be; for it cannot pass away as soon as it is coming to be coming to be something, nor after it has come to be; for what is passing away must be. Further, there must be a matter that underlies what comes to be and changes. What then will it be? What is it that becomes a movement or a coming to be, as a body or a soul is what undergoes alteration? And further, to what do they move? For what it must be the movement or coming to be of is something from something to something. But how can it be? For the process of learning is not of the process of learning, and so no coming to be is of coming to be either.

Since there is no movement either of substance, of the relative, or of acting on and being acted on, it remains for movement to be with respect to quality, quantity, and place (for each of these admits of contrariety). By "quality" I mean not what is in the substance (for even the difference is a quality), but the affective quality in virtue of which a thing is said to be acted on or to be incapable of being acted on.

The immovable, however, is either what is wholly incapable of being moved; or is moved scarcely at all in a long time or is slow in starting to be moved; or what is naturally moved and is capable of being so but is not moved either when, where, or how it should naturally be moved. Among the immovables, the last is the only one I call "at rest"; for rest is contrary to movement, so that it must be a privation in what is receptive of movement.

What are together in place are things that are in one primary place, and what are separate are things that are in distinct primary places. Things are making contact [or touching] when their extremes are together in place. An intermediate is what a changing thing—if it changes continuously[488]—arrives at prior to arriving at the ultimate thing to which, in accord with its nature, it is changing. What are contrary in place are what are most distant in a straight line. What is successive is what is after the starting-point (the order being determined by position or form or in some other way) and has nothing of the same kind between it and what it succeeds—for example, lines in the case of line, units in that of unit, or houses in that of house (but there is nothing to prevent something of some other kind from being in between). For what

488. Omitting τὸ.

is successive is successive of something and is something posterior; for one does not
1069^a1 succeed two, nor the first day of the month the second. What are contiguous are what are successive and making contact. (Since all change is between opposites, and these are either contraries or contradictories, and there is no middle term between contradictories, clearly what is intermediate is between contraries.) Continuity is precisely a sort of contiguity. I mean that two things are continuous when the limits of each, by which they make contact and by which they are kept together, become one and the same. So it is clear that the continuous is found in those things that by nature become one in virtue of their making contact. It is also clear that the successive is primary (for things that are successive do not [necessarily] make contact, but things that make contact are successive; and if things are continuous, they make contact, but if they make contact, they are not necessarily continuous; and in things in which there is no contact, there is no natural unity). So a point is not the same as a unit; for in points there is contact, while in units there is not, but only succession; and while between points there is something intermediate, between units there is not.

BOOK 12 (LAMBDA)[489]

12.1
Substance and Its Varieties

The theoretical investigation [being discussed] is concerned with substance; for it is the starting-points and the causes of substances that are being inquired about. For if in fact we take the universe to be a whole of some sort,[490] substance is its primary part, and if it exists by being a succession,[491] in this way too substance is primary, then quality or quantity. At the same time, these latter things are not (one might almost say) unconditionally beings but qualities and movements—or else even the not-white and the not-straight will be beings (at any rate, we say that even these things *are*—for example, that something *is* not-white[492]). Further, none of the others is separable.

The early philosophers also in effect testify to this; for it was of substance that they were inquiring about the starting-points, elements, and causes. Present-day thinkers posit the universals as substances to a higher degree (for the kinds are universal, and these they say are starting-points and substances to a higher degree, because they inquire in a logico-linguistic way), while thinkers of older days [posit] the particulars, such as fire and earth as substances, but not what is common: body.

489. Text: S. Alexandru, *Aristotle's* Metaphysics *Lambda* (Leiden, 2014).
490. 1016^b12–13, 1052^a22.
491. A view like that of Speusippus. See 1028^b20–27, 1075^b34–1076^a4.
492. 1017^a18–19, 1030^a25–26.

There are three sorts of substances. One is perceptible, of which one sort is eternal and one (which all agree on) is capable of passing away, such as plants and animals; of this it is necessary to grasp the elements, whether one or many. And another sort is immovable, and this certain thinkers say is separable, some dividing it into two, the Forms and the objects of mathematics, others positing these two as one in nature, and others only one of these, the objects of mathematics.[493] The first two sorts belong to natural science (for they involve movement), but the third to another science, if no starting-point is common to these.

12.2
Matter and Change

Perceptible substance is changeable. But if change is from opposites or from intermediates,[494] and not from all opposites (for the voice is not white [but does not change to white]) but from the contrary one, there must be something underlying that changes to the contrary state; for the contraries do not change. Further, while something remains [throughout the change], the contrary does not remain. There is, therefore, some third thing beyond the contraries, the matter. If, then, changes are of four sorts, either with respect to the [this] something, or with respect to the quality, quantity, or place, and if unconditional coming to be and passing away are with respect to the this, growth and withering with respect to quantity, alteration with respect to an affection, spatial movement with respect to place, changes would in each case be to the corresponding contrary states.[495] It is necessary, then, for the matter, which changes, to be capable of both states.

But since being is twofold, everything changes from what is potentially to what is actively—for example, from what is potentially white to what is actively white, and similarly in the case of growth and withering. So not only is it possible, coincidentally, for something to come to be from what is not, but also for all things to come to be from what is—from what is potentially, however, but from what actually is not. And this is one [of the two elements] of Anaxagoras.[496] For it is better than "all things were together,"[497] the "mixture" of Empedocles and Anaximander, and what Democritus says. For us[498] all things were together potentially, but not actively, so that these thinkers would seem to be latching on to matter.

493. Plato (1028^{b}19–20), Xenocrates (1028^{b}24–27), Speusippus (1028^{b}21–24, 1076^{a}20–21).
494. 1067^{b}12–1068^{a}7.
495. *GC* 320^{a}2–5.
496. 989^{a}30–33.
497. B1 DK. Also, 1056^{b}28–30.
498. Reading ἡμῖν.

All things that change have matter, however, but of distinct sorts.[499] And of eternal things those that do not admit of coming to be but do admit of spatial movement have matter—not matter for coming to be, however, but for movement from where to where.

One might raise a puzzle about what sort of not being coming to be is from; for not being is trifold.[500] If, then, there is something that is potentially something, nonetheless it is not potentially any random thing, but rather distinct things come from distinct things. Nor is it enough to say all things were together; for they differ in their matter; for otherwise why did an unlimited number of things come to be and not one? For the understanding is one, so that if the matter was also one, that thing would have come to be actively which the matter was potentially. The causes, then, are three, and the starting-points three; two of them are the contraries, of which one is the account and the form and the other the privation, and the third the matter.

12.3
Coming to Be and Its Causes

Next, note that neither the matter nor the form comes to be—I mean the ultimate ones.[501] For everything that changes is something, and changes as a result of something, to something. That as a result of which is the direct mover; what changes is the matter; what it changes to, the form. So the process will go on without limit, if not only the bronze becomes round, but the round or the bronze come to be as well. There must, then, be a stopping point.

Next, note that each substance comes to be from something with the same name (for the things that are by nature are substances, and so are the others). For things come to be either by craft, by nature, by luck, or by chance. Craft is a starting-point that is in another thing, while nature is a starting-point in the thing itself (for a human begets a human), and the remaining causes are privations of these.

There are three sorts of substances: the matter, which is a this something [merely] in appearance (for whatever is by contact and not by natural unity is matter and underlying subject); the nature, which is a this something and a certain state toward which; and further, thirdly, the one composed of these which is a particular, such as Socrates or Callias. In some cases the this something is not beyond the composite substance (for example, the form of a house is not, unless as the craft of building, nor is there coming to be or passing away of these, but instead it is in another way that there is or is not a house that is without matter, or health, or anything that is in accord with craft), but if indeed it is so in any, it is in the case of the ones that are by

499. 1042ᵇ5–6.
500. 1067ᵇ25–1068ᵃ7.
501. I.e., the ones that must already be there when production or coming to be begins (1033ᵃ24–ᵇ5).

nature—which is why Plato was not far wrong in saying that there are as many Forms as there are sorts of things that are by nature (if indeed there are Forms other than these)—for example, fire, flesh, head; for these are all matter, and of what is most of all substance, the final matter.[502]

The moving causes are causes in the way preexisting things are, while those that are causes in the way that the account is exist at the same time as what they cause. For it is when the human is healthy that at the same time too the health is there, and the shape of a sphere of bronze is there at the same time as the brazen sphere. (But whether any form remains also afterward must be investigated; for in some cases there is nothing to prevent this—for example, the soul may be like this, not all soul, but rather the understanding;[503] for that all of it should be so is perhaps impossible.)

It is evident, then, that there is no necessity—because of these considerations, at any rate—for there to be the Forms; for a human begets a human, the particular one begetting the particular one; and similarly in case of the crafts; for the craft of medicine is the account of health.

12.4
The Causes and Starting-Points of Distinct Substances Are in a Way the Same

The causes and starting-points of distinct things are distinct in a way, but in a way—if one is to speak universally and analogically—they are the same for all. For one might raise a puzzle as to whether the starting-points and elements of substances and of relatives are distinct or the same, and similarly, then, in the case of each of the categories. But it would be absurd if they were the same for all; for relatives and substances would then both come from the same ones. What, then, will these be? For beyond substance and the other categories of predicables there is nothing common, but an **$1070^{b}1$** element is prior to the things of which it is an element. But then substance is not an element of relatives either, nor is any of these an element of substance. Further, how can all things possibly have the same elements? For none of the elements can be the same as the thing that is composed of elements—for example, A or B as BA (nor, then, is any of the intelligible things an element—for example, being or one; for these also belong to each of the composite things). None of the elements, then, will be either a substance or a relative—but this is necessary.[504] Nor, therefore, do all things have the same elements.

Or, as we say, there is a way in which they do and there is a way in which they do not. For example, perhaps the elements of perceptible bodies are, as form, the

502. E.g., as the head is of the whole animal.
503. *DA* $408^{b}18$–25, $430^{a}23$.
504. Since substance and relative are stand-ins for categories generally ($1070^{a}35$) and nothing can exist if it does not belong to some category.

hot[505] and, in another way, the cold, which is the privation; and, as matter, what is potentially these directly and intrinsically. And both these and the things composed of them are substances, of which these are the starting-points, that is, anything that comes to be from the hot and the cold that is one [something-or-other], such as flesh or bone; for what comes to be from these must be distinct from them. These things, then, have the same elements and starting-points (although distinct things have distinct ones). But that all things have the same ones is not something one can say just like that, although by analogy we can. That is, one might say that there are three starting-points—the form, the privation, and the matter. But each of these is distinct for each category—for example, in color they are white, black, and surface, or light, darkness, and air, out of which day and night come to be.

But since not only the things present in something are causes, but also certain external things, for example, the mover, it is clear that though starting-point and element are distinct, both are causes, and the starting-point is divided into these, while what is so in the sense of moving or causing rest is a sort of starting-point and substance. So analogically there are three elements, and four causes and starting-points. But distinct things have distinct ones, as was said,[506] and the direct cause in the sense of a mover is distinct for distinct things. Health, sickness, body—the mover is the craft of medicine. Form, disorder such as this, bricks—the mover is the craft of building. And since the mover is, in the case of natural things, the one that is the same in form, for example, human for human, and in those that come from thought it is the form or its contrary, there would in a way be three causes, and in a way four. For the craft of medicine is in a way health, and the craft of building is the form of a house, and a human begets a human; further, beyond these there is what as the first of all [movers] moves all things.

12.5
More on the Causes and Starting-Points of Substances

But since some things are separable and others are not separable, the former are substances. And because of this the causes of all things are the same, because without **1071ᵃ1** substances, there are no affections or movements. Next, these causes will presumably be soul and body, or understanding, desire, and body.

Further, there is another way in which the causes are analogically the same: activity and potentiality. But these too are not only distinct for distinct things but also apply to them in distinct ways. For in some cases the same thing is sometimes active and sometimes potential—for example, wine or flesh or human (but these also fall under the causes mentioned;[507] for what is actively is the form, if it is separable, as is what is composed of both [matter and form], as is the privation—for example, darkness or

505. 1040ᵇ5–10.
506. 1070ᵇ17.
507. I.e., form, privation, matter (1070ᵇ25–34).

sickness; but what is potentially is the matter; for this is what is capable of becoming both). But active and potential differ in another way in the case of things whose matter is not the same, of which the form is not the same but distinct—just as, for example, the cause of a human is both his elements, fire and earth as matter and the special form [as form], and further, some other external thing, such as the father, and beyond these the sun and its movement in an inclined circle,[508] which are not matter, form, or privation, and are not the same in form [as father or son], but are movers.

Further, it must be observed that some causes can be stated in universal terms, while others cannot. The this that is first active, and a distinct thing that is potential, are the starting-points of all things. Those things, however, the universal causes, do not exist; for the particular is the starting-point of the particulars; for while human is the starting-point of human universally, there is no universal human—instead, Peleus is of Achilles, and your father of you, and this B of this BA, and B in general of BA unconditionally.

Next, [the causes and elements][509] of substances (but distinct ones of distinct ones) are, as was said, the causes and elements of things that are not in the same kind—of colors, sounds, substances, quantity—except by analogy. And those of things in the same form are distinct, not in form, but because the causes of the particular ones—your matter, form, and mover and mine—are distinct, but in universal account they are the same.

When one inquires, then, about the starting-points or elements of substances, relatives, and qualities, as to whether they are the same or distinct, it is clear that, when they are said of things in many ways, they are the same, but when these are distinguished the starting-points and elements are not the same but distinct—except in this way: and in this way way the causes of all are the same, by analogy, because they are matter, form, privation, and mover; and in this way the causes of substances may be considered as the causes of all things, because if substances are done away with, all things are done away with. Further, the first thing in actuality [is a cause of all things]. In this other way, there are distinct direct causes: the contraries that are neither said of things as kinds nor said in many ways, and further the matters.

What the starting-points of perceptible things are, then, how many they are, and in what way they are the same and in what way distinct has now been stated. **1071**[b]**1**

12.6
The Need for an Eternal Immovable Substance That Is in Essence an Activity

Since there were three sorts of substances, two of them natural and one immovable, concerning the latter it must be said that it is necessary for there to be an eternal immovable substance; for substances are primary among the beings, and if they are

508. *GC* 336[a]23–[b]12.
509. Reading ἔπιτα ἤδη τὰ.

all capable of passing away, everything is capable of passing away. But it is impossible that movement either came into being or passed away (for as we saw[510] it always is), or that time did; for there cannot be a before and an after if there is no time. Movement too is continuous, therefore, in the way that time also is; for time is either the same thing as movement or an affection of it.[511] But there is no continuous movement except movement in place, and of this only that which is circular is continuous.[512]

But then if there is something that is capable of moving things or acting on them, but that is not actively doing so, there will not [necessarily] be movement; for it is possible for what has a capacity not to activate it. There is no benefit, therefore, in positing eternal substances, as those who accept the Forms do, unless there is to be present in them some starting-point that is capable of causing change. Moreover, even this is not enough, and neither is another substance beyond the Forms; for if it will not be active, there will not be movement. Further, even if it will be active, it is not enough, if the substance of it is a capacity; for then there will not be eternal movement; for what is potential may possibly not be. There must, therefore, be this sort of starting-point, one whose substance is activity. Further, these substances must therefore be without matter; for they must be eternal, if indeed anything else is eternal. Therefore, they must be activities.[513]

And yet there is a puzzle; for it seems that everything that is active is capable of being active, while not everything that is capable of being active is active, so that the capacity is prior. But then if this is so, none of the beings will be; for it is possible to be capable of being and not be yet.

And yet if things are as the theologians say, who generate things from Night,[514] or as the natural scientists do who say that all things were together, the same impossibility results. For how will anything be moved if there is not something that is actively a cause? For wood will surely not move itself, but the craft of carpentry will, nor will the menses or the earth move themselves, but the seeds and the semen will.

That is why some thinkers such as Leucippus[515] and Plato[516] posit eternal activity; for they say that there is always movement. But why and what it is they do not say, nor, if the movement is this way or that, what the cause is. For nothing is moved at random, but there must always be some particular sort present—just as, as things stand, a thing moves in one way by nature and in another by force or as a result of understanding or of something else. Further, what sort of movement is primary?[517] This makes an enormous difference. But again in the case of Plato, at any rate, it is

510. *Ph.* 251ᵃ18–28.
511. *Ph.* 219ᵇ1–2.
512. *Ph.* 261ᵃ31–ᵇ7.
513. Reading ἐνέργειαι.
514. Hesiod, *Theogony* 124, *Works and Days* 17.
515. *Cael.* 300ᵇ8–10.
516. *Timaeus* 30a.
517. *Ph.* 8.7.

not possible even to state what he sometimes thinks[518] the starting-point is, namely, what moves itself; for the soul is later than and coeval with the heaven, according to his account. **1072ª1**

To think, then, that capacity is prior to activity is in one way correct and in another way not—and it has been stated how.[519] But that activity is prior is attested by Anaxagoras (for understanding is an activity) and by Empedocles (love and strife), and by those who say that there is always movement, as Leucippus does. So chaos or night did not exist for an unlimited time; rather, the same things existed always (either passing through a cycle of changes or in some other way), if indeed activity is prior to capacity.

If the same thing is always moving cyclically, something [A] must always remain, acting in the same way, and if there is to be coming to be and passing away, there must be something else [B] that is always acting now in one way, now in another.[520] Therefore, this [B] must act in one way intrinsically and in another in virtue of something else—either of a third thing [C], therefore, or of the first [A]. It must, then, be in virtue of this one [A]. For otherwise this [A] again causes the movement of that one [C] and of the other one [B]. Therefore, it is better to say the first [A]; for in fact it was the cause of things always occurring in the same way, and something else the cause of their occurring in another way, and of their always occurring in another way clearly both are the cause. This, therefore, is the way the movements actually take place. Why, then, inquire after other starting-points?

12.7
The Primary God as Immovable Mover

Since it is possible that things are this way, and if they are not this way, they would have come from night, or all things together, or from not being, these issues may be taken as resolved. And there is something that is always moved with an unceasing movement, which is in a circle (and this is clear not from argument alone but also from the facts). So the primary heaven[521] would be eternal. There is, therefore, also something that moves it. But since what is moved and moves something is also something intermediate, there is something that moves without being moved, being eternal, substance, and activity.

And this is the way the object of desire and the intelligible object move things: they move them without being moved.[522] Among these objects, the primary ones are the same. For the [primary] object of appetite is the apparently noble,[523] and the primary

518. *Phaedrus* 245c–246a, *Timaeus* 30a, 34b–c, *Laws* 896a.
519. 9.8.
520. *GC* $336^{a}23$–$^{b}12$.
521. *Cael.* $288^{a}13$–17, $292^{b}22$–23.
522. *MA* 6.
523. $1078^{a}31$–32. The point is usually made in terms of the good. See *NE* 3.4.

object of wish is the really noble. But we desire something because it seems [noble] rather than its seeming so because we desire it. For the starting-point is the active understanding. And understanding is moved by the intelligible object, and what is intrinsically intelligible is the one column [of opposites], and in this substance is primary, and in this the one that is simple and in accord with activity [is primary]—but one and simple are not the same; for one signifies a measure,[524] while simple signifies how the thing is. But the noble too, and what is choiceworthy because of itself, are in the same column, and what is primary is always best or analogous to the best.

1072b1 That the for-the-sake-of-which does exist among the immovable things is made clear by a distinction; for the for-the-sake-of-which is both for something and of something,[525] and of these the latter is immovable while the former is not. And it produces movement insofar as it is loved, while it is by something's being moved that it moves the other things.

If something is moved, it also admits of being otherwise than it is, so that if the spatial movement is primary and an activity, insofar as it is being moved, in this respect it admits of being otherwise—with respect to place, even if not with respect to substance. But since there is something that moves while it itself is immovable, though it is in activity,[526] it can in no way admit of being otherwise. For spatial movement is primary among the sorts of change, and of these, that in a circle is primary; and this it produces. Therefore, it of necessity exists; and insofar as it exists of necessity, it is in a noble state, and in this way a starting-point [of movement]. For something is said to be necessary in a number of ways—as what is forced contrary to impulse, as that without which the good does not exist, and as what does not admit of being otherwise, but is necessary unconditionally.

This, therefore, is the sort of starting-point on which the heaven and nature depend. And its pastime is like the best that we can have—and have for a short time (for it is always in that state [of activity], while we cannot be)—since its activity is also a pleasure. And because of this, waking, perceiving, and active understanding are a very great pleasure, and expectations and memories because of these.

Active understanding is intrinsically of what is intrinsically best, and the sort that is to the highest degree best is of what is to the highest degree best. And the understanding actively understands itself by partaking of the intelligible object; for it becomes an intelligible object by touching and understanding one, so that understanding and intelligible object are the same.[527] For what is receptive of the intelligible object and of the substance is the understanding, and it is active when it possesses it, so that the former rather than the latter[528] seems to be [the] divine thing that the understanding possesses, and contemplation seems to be the most pleasant and best thing.

524. 1016b18–21.
525. *DA* 415b2–3.
526. *NE* 1154b26–27.
527. *DA* 429b30–430a7.
528. Reading ἐκεῖνο μᾶλλον τούτου.

If, then, that good state [of activity], which we are sometimes in, the [primary] god is always in, that is wondrous, and if to a higher degree, that is yet more wondrous. And this is his state. And life too certainly belongs to him; for the activity of understanding is life, and his activity is that;[529] and his intrinsic activity is life that is best and eternal. We say, then, that the god is a living being who is eternal and best, so that living and a continuous and everlasting eternity belong to the god; for this is the god.

Those who suppose, as the Pythagoreans and Speusippus do,[530] that the noblest and best is not present in the starting-point, because, while the starting-points of both plants and animals are causes, the noble and complete are in what comes from these, are not correct in their thinking. For the seed comes from other things that are prior and complete, and the first thing is not seed but the complete thing, as one might say the human is prior to the seed—not the one who came to be from it but another one from whom the seed came.

It is evident from what has been said, then, that there is a sort of substance that is eternal and immovable and separate from perceptible things. And it has also been proved that this substance cannot have any magnitude, but must be without parts and indivisible (for it moves something for an unlimited time, and nothing finite has unlimited capacity; and, since every magnitude is either unlimited or finite, it cannot have a finite magnitude, because of what was said, and it cannot have an unlimited magnitude because there is no unlimited magnitude at all). But then it has also been proved that it is impassive and inalterable; for all the other movements are posterior to that with respect to place.

It is clear, then, why things are this way.

12.8
The Number of Immovable Movers and Why There Is Only One Heaven

But one must not overlook whether one substance of this sort must be assumed or several, and, if several, how many. But we must remind ourselves too about the views of the others, that they have said nothing that can even be perspicuously stated about how many they are. For the supposition of Forms contains no special investigation of the issue (for those who accept the Forms say that the Forms are numbers, and where numbers are concerned they sometimes speak as if they were unlimited, sometimes as if, being defined up to ten,[531] they were finite; but about the cause of there being this many numbers nothing is said with demonstrative seriousness). We, however, must

529. Reading ἐκεῖνο.
530. $1091^{a}29$–$1092^{a}5$, $1092^{a}11$–17.
531. $1084^{a}12$–$^{b}2$, *Ph.* $206^{b}31$–32.

speak about the issue on the basis of the assumptions and determinations already made.

The starting-point and first of the beings is immovable both intrinsically and coincidentally, but it causes the primary eternal and single movement. But since what is moved must be moved by something, and the primary mover must be intrinsically immovable, and eternal movement must be caused by something eternal, and a single movement by a single thing, and since we see that beyond the simple spatial movement of the universe, which we say the primary and immovable substance causes, there are other spatial movements—those of the planets—that are eternal (for the body with a circular movement is eternal and unresting, as has been proved in our studies concerning nature[532]), each of these spatial movements must be caused by a substance that is both intrinsically immovable and eternal. For the nature of the stars is eternal, because it is a certain sort of substance, and the mover is eternal and prior to the moved, and what is prior to a substance must be a substance. It is evident, therefore, that there must be this number of substances that are in their nature eternal and intrinsically immovable, and without magnitude (due to the cause mentioned previously[533]).

1073b1 It is evident, then, that the movers are substances, and that one of these is first and another second in accord with the same order as the spatial movements of the stars. But when we come to the number of these spatial movements, that is actually something one must investigate on the basis of the mathematical science that is most akin to philosophy: astronomy; for it is concerning substance that is perceptible but eternal that this makes its theoretical investigation, while the others are not concerned with any substance at all—for example, the one concerned with numbers and geometry.

That the spatial movements are more numerous than the bodies that are moved is evident even to those with a moderate grasp on the subject (for each of the planets has more than one spatial movement). But as for how many these [movements] are, we now—to give some notion of it—state what some of the mathematicians say, so that there must be some definite number for our thought to grasp. But as for the rest,[534] we must speak in part having inquired ourselves, in part having learned from the inquirers, and if something contrary to what is now said appears correct to those who are busying themselves with these issues, we should welcome both, but be persuaded by the more exact ones.

Eudoxus, then, posited that the spatial movement of the sun and the moon in each case involves three spheres, of which the first is the sphere of the fixed stars, the second moves in the [circle] along the middle of the zodiac, and the third moves in the one inclined across the breadth of the zodiac (but the circle in which the moon

532. *Ph.* 8.8–9, *Cael.* 1.2, 2.3–8.
533. 1073a5–11.
534. I.e., what comes after a definite number of movements has been suggested.

moves is inclined at a greater angle than that in which the sun is spatially moving). The spatial movement of the planets involves in each case four spheres, and of these the first and the second are the same as for the sun and the moon (for the sphere of the fixed stars is what moves all the other spheres, and the one that is placed beneath this and has its spatial movement in the circle along the middle of the zodiac is common to all the spheres). But the poles of the third sphere of each planet are in the circle along the middle of the zodiac, while the spatial movement of the fourth sphere is inclined at an angle to the equator of the third one. Also, the poles of the third sphere are special to the various planets, but those of Venus and of Mercury are the same.

As for Callippus, he posited the same position of the spheres that Eudoxus posited, but while he assigned to Jupiter and Saturn the same number as Eudoxus did, he thought that two further spheres should be added to the sun and to the moon, if one is to account for the appearances, and one more to each of the other planets.[535] But if all the spheres combined are to account for the appearances, for each of the planets there must be other spheres, but one fewer, which counteract the former, and in each case restore to the same position the first [or outermost] sphere of the star that is placed beneath the star in question; for only in this way is it possible for all the combined spheres to produce the spatial movement of the planets. Since, then, the spheres in which the planets themselves are carried along are eight [for Jupiter and Saturn] and twenty-five [for the others], and of these, only those in which the lowest one is carried along does not need to be counteracted, the spheres that counteract those of the first [or outermost] two planets will be six, and those counteracting the spheres of the next four will be sixteen.[536] The number, then, of all the spheres, both moving and counteracting, will be fifty-five. And if one does not add to the moon and the sun the movements mentioned,[537] all the spheres will be forty-seven[538] in number.

535. The reason for these modifications is not entirely clear.

536. Starting with the primary or outermost heaven we have a series of concentric spheres encircling the earth. The sphere of the moon is the innermost celestial sphere, so that below it there is no other (hence "one fewer"). Suppose, then, that A (outermost), B, C, D (innermost) are the four spheres on which, according to Eudoxus and Callippus, Saturn is affixed. Inside sphere D, Aristotle is proposing to insert a first reactive sphere D*, which rotates on the poles of D and at the same speed, but in the opposite direction. The rotations of D and D* cancel each other, so that any point on D* will move as if rigidly connected to C. Inside D* in turn is placed a second reactive sphere C*, which is related to C as D* is to D, so that any point of C* will move as if rigidly connected to B. Finally, inside C* is placed B*, with the result that any point on B* will move as if rigidly connected to A. But A, as the outermost sphere of Saturn, has the movement of the fixed stars; hence B* will also have that movement. As a result the spheres of Jupiter, which are inside those of Saturn, can move inside B* as if Saturn's spheres did not exist and as if B* were the sphere of the fixed stars.

537. I.e., the four extra ones proposed by Callippus (1073ᵇ25–26) together with the two reactive spheres needed for the sun (the moon needs none), for a total of six.

538. Reading ἑπτὰ. The correct number is forty-nine = fifty-five minus six.

Let this, then, be the number of the spheres; so that to suppose that the substances and starting-points that are immovable and beyond[539] the perceptible ones are also just that many is reasonable (for that it is necessary must be left to stronger thinkers[540] to claim). But if there can be no spatial movement that does not contribute to the spatial movement of a star, and if furthermore every nature and every substance that is impassive and has intrinsically attained the best end must be regarded as an end, there can be no other nature beyond these, and this must be the number of the substances. For if there were others, they would produce movement by being an end of spatial movement. But there cannot be any other spatial movements beyond those mentioned. It is reasonable to suppose this on the basis of the bodies that are moved. For if everything that carries something along naturally does so for the sake of what is carried along, and every spatial movement is the movement of something that is spatially moved, no spatial movement can be for the sake of itself or of another spatial movement, but all the movements must be for the sake of the stars. For if there is to be a spatial movement for the sake of a spatial movement, this latter will also have to be for the sake of something else. And so, since this cannot go without limit, the end of every spatial movement will be one of the divine bodies that are spatially moved throughout the heaven.

And that there is but one heaven is evident. For if there are many, as there are many humans, the starting-point for each will be one in form but in number many. But all things that are many in number have matter (for one and the same account applies to many, for example, humans, while Socrates is one). But the primary essence does not have matter; for it is an actuality. Therefore, the primary immovable mover is one both in account and in number—and so, therefore, is what is moved always and continuously, one alone. Therefore, there is one single heaven.

There is a tradition handed down from the ancients of the earliest times and bequeathed to posterity in the shape of a myth to the effect that these[541] are gods and that the divine encompasses the whole of nature. The rest of the tradition has been added later in a mythical way with a view to the persuasion of ordinary people and with a view to its use for legal purposes and for what is advantageous; for they say that these gods are human in form or like some of the other animals, and also other features that follow from or are much the same as those just mentioned. But if one separates the first point from these additions and grasps it alone, that they thought that the primary substances were gods, one would have to regard it as divinely said, and that while it is likely that each craft and each philosophy has often been developed as far as possible only to pass away again,[542] these beliefs about the gods have survived like remnants until the present. The belief of our forefathers, then, and of our earliest predecessors is to this extent alone illuminating to us.

539. Reading παρὰ.
540. 1073b15.
541. I.e., the primary substances. See 1074b9.
542. *Cael.* 270b19–20, *Mete.* 339b27–29, *Pol.* 1329b25–30.

12.9
Divine Understanding and the Primary God

Issues concerning the [divine] understanding involve certain puzzles; for while it seems to be the most divine of the appearances,[543] the question of how it can have that character involves certain difficulties. For if, on the one hand, it understands nothing, where is its dignity? It would be just like someone asleep. And if it does understand something, but another thing controls it (for what it is, its substance, is not active understanding, but a capacity), it would not be the best substance; for it is because of actively understanding that esteem belongs to it.

Further, whether it is understanding [as a capacity] or active understanding that is the substance of it, what does it understand? For it is either itself or something else. And if something else, either always the same thing or sometimes this and sometimes that. Does it, then, make a difference or none at all whether it actively understands the noble or some random object? Surely, it would be absurd for it to think of certain things. It is clear, therefore, that it actively understands what is most divine and most estimable and does not change [its object]; for change would be for the worse, and would already be a sort of movement.

First, then, if its substance is not active understanding, but rather a capacity [to understand], it is reasonable to suppose that the continuity of its active understanding is laborious for it.[544] Next, it is clear that something else would be more estimable than the understanding, namely, what is understood. For both [the capacity] to understand and active understanding will belong even to someone who actively understands the worst thing, so that if this is to be avoided (for there are in fact some things that it is better not to see than to see), the active understanding would not be the best thing. It is itself, therefore, that it understands, if indeed it is the most excellent thing, and the active understanding is active understanding of active understanding.

It appears that scientific knowledge, perception, belief, and thinking are always of something else, and of themselves only as a by-product. Further, if to understand and to be understood are distinct, in virtue of which of them does the good belong to it? For the being for an active understanding is not the same as the being for a thing understood. The answer is that in some cases the scientific knowledge is the thing. In the case of the productive sciences isn't it the substance and the essence **1075^{a}1** without the matter? In the case of the theoretical sciences isn't it the account, the thing, and its active understanding? In the cases, then, where the thing understood and the understanding of it are not distinct, in those where the thing understood has

543. 1074^{a}1, *Ph.* 196^{a}33–34.
544. 1050^{b}22–28.

no matter, they will be the same, and the active understanding will be one with the thing understood.[545]

A further puzzle remains as to whether the thing understood is composite; for if it were, the [divine] understanding would undergo change in understanding the parts of the whole. The answer is that everything that has no matter is indivisible, just as the human understanding [of such things] is, or the understanding even of composite things in a certain time (for it does not possess the good in [understanding] this or that [part], rather, in [understanding] a certain whole, it possesses the best, being something else), and this is the condition of this active understanding which, for all eternity, is an active understanding of itself.

12.10
The Primary God and the Nature of the Whole

One must also investigate in which of the two ways the nature of the whole possesses the good and the best—whether as something separated and intrinsic, or as its organization. The answer is in both ways, like an army. For the good of an army is in its organization, and is also the general—and more so the latter; for he is not because of the organization, but it is because of him. All things are jointly organized in a way, although not in the same way—even swimming creatures, flying creatures, and plants. And the organization is not such that one thing has no relation to another, but rather there is a relation. For all things are jointly organized in relation to one thing—but it is as in a household, where the free people least of all do things at random, but all or most of the things they do are organized, while the slaves and beasts can do a little for the common thing, but mostly do things at random; for this is the sort of starting-point that the nature is of each of them. I mean, for example, that all must come to be disaggregated,[546] at any rate; and similarly there are other things which they all share for [the good of] the whole.

However, one should not overlook the impossibilities and absurdities that follow for those who say otherwise, and what sorts of things are said by those who speak in a more sophisticated way, and what sorts involve the fewest puzzles. For all of them make all things from contraries. But neither all things nor from contraries is correct, nor do they say how those things in which contraries are present will be made from them; for contraries are impassive with respect to each other.[547] For us this issue is resolved in a reasonable way, by there being a third thing.[548] But others make one of the two contraries matter, as, for example, do those who

545. 1072[b]19–21.
546. I.e., into their elements.
547. *Ph.* 189[a]21–26.
548. I.e., the matter.

make the unequal matter for the equal or the many for the one.[549] And this too is resolved in the same way; for the matter, which is one, is not the contrary of anything.[550] Further, all things, outside the one, will participate in the bad; for the bad is itself one of the elements. (Others do not even regard the good and the bad as starting-points. And yet in all things the good is most of all a starting-point.) They are, however, correct about this, that the good is a starting-point. But in what way the good is a starting-point they do not say—whether as end, or as mover, or as form.

1075^{b}1

Empedocles also speaks absurdly; for he makes love be the good,[551] and this a starting-point both as mover (for it brings together) and as matter; for it is a part of the mixture. But even if the same thing is coincidentally a starting-point both as matter and as mover, nonetheless their being is not the same. To which, then, does love correspond? It is absurd too for strife to be incapable of passing away; for strife for him is the nature of the bad.[552]

Anaxagoras makes the good his starting-point as mover; for the understanding moves things.[553] But it moves them for the sake of something, so that this is a distinct thing, except in our way of describing it; for the craft of medicine is in a way health. It is absurd too not to posit a contrary to the good and to the understanding. But all those who speak of contraries fail to use contraries, unless one reformulates what they say.

Also, why some things are capable of passing away while others are incapable of passing away, no one says; for they produce all the beings from the same starting-points. Further, some produce the beings from what is not, while others, in order to avoid having to do this, make all things one.

Further, why there will always be coming to be, and what the cause of coming to be is, no one says. And for those who posit two starting-points there must be another starting-point with more control. And for those who posit the Forms there will be yet another starting-point with more control; for why did things come to participate, or why do they participate, [in the Forms]?

Also, for the others there must be some contrary to theoretical wisdom and the most estimable science, but not for us. For nothing is contrary to the primary thing; for all contrary things have matter, and such things are potential. The contrary state, ignorance, leads to the contrary, but to the primary thing nothing is contrary.

Further, if beyond the perceptibles there are not going to be any other things at all, there will not be a starting-point, order, coming to be, or celestial movements,

549. I.e., Platonists (988^{a}7–14).
550. Reading ἡ μία οὐδενὶ ἐναντίον.
551. 985^{a}21–29.
552. 1051^{a}15–21.
553. 984^{b}8–22, 985^{a}18–21.

but always a starting-point of the starting-point, as there is for the theologians[554] and all of the natural scientists.

But if the Forms or the numbers are going to be the starting-points, they will be cause of nothing—or, if not that, at least not of movement. Further, how will what is a magnitude and continuous come from what lacks magnitude? For number will not produce something continuous, either as mover or as form.

But again there will not be one of the contrary things that will be precisely what is both capable of acting [on things] and capable of moving [things]; for it would admit of not being. But again acting [on things] is posterior to capacity. Therefore, the beings will not be eternal. But they are. Therefore, one of these must be done away with. And it has been said[555] in what way.

Further, about what makes numbers one, or soul and body, or, in general, form and thing, no one says anything. Nor is it possible, unless one says it as we do,[556] to say in what way the mover makes them one. And those who say that mathematical number is primary,[557] and that in the same way there is again and again some other contiguous substance and a starting-point of each, make the substance of the universe episodic (for one substance contributes nothing to another by being or not being) and posit many starting-points. The beings, however, do not wish to be badly governed: "To have many rulers is not good; let there be one ruler."[558]

BOOK 13 (MU)

13.1
Mathematical Objects and Platonic Forms as Substances and Causes

As regards the substance of perceptibles, it has been said what it is, dealing with matter in the methodical inquiry into natural things, and later with substance as activity.[559] But since the investigation is into whether or not beyond the perceptible substances there is any that is immovable and eternal, and, if there is, what it is, it is first necessary to get a theoretical grasp on what is said by others, so that, if there is anything they say incorrectly, we may not be liable to the same objections, while if there is any belief common to us and them, we may not on that account have any

554. 1071b26–31.
555. 1072a3–18.
556. 1045a20–33.
557. E.g., Speusippus. See 1028b20–27.
558. Homer, *Iliad* 2.204. See *Pol.* 1292a13.
559. 7.3–9.5, 12.1–5; 9.6–10, 12.6–10.

private misgivings against ourselves; for one must be content if one states some things better and others no worse.

There are two beliefs on this subject. Some people say that the objects of mathematics—for example, numbers, lines, and things of that kind—are substances, and in addition that the Forms are. And since some make these two distinct kinds of things—the Forms and the mathematical numbers—and some posit a single nature for both, while some others say that only the mathematical substances are substances,[560] the objects of mathematics must be investigated first, without positing any other nature for them—not asking, for example, whether they are in fact Forms or not, or whether they are starting-points and substances of the beings or not, but only whether, considered as objects of mathematics, they exist or not, and if they exist, in what way they do. Then after this one must separately investigate the Forms themselves but in general terms and to keep with the usual way of doing things; for most of the points have been made also in the external accounts. Further, the greater part of the account must relate to this question, when we will investigate whether substances and the starting-points of the beings are numbers and Forms; for after the Forms this remains as a third investigation.[561]

If indeed the objects of mathematics exist, however, they must exist either in perceptibles, as some say, or separate from perceptibles (there are also some who say this), or, if they exist in neither way, either they do not exist or they exist in some other way. So our dispute will not be about whether they exist but about the way they do.

13.2
The Ways Objects of Mathematics Do Not Exist

That it is impossible for the objects of mathematics to exist in perceptibles, and at the same time that the argument for it is fabricated, has also been stated in going through the puzzles,[562] where it was pointed out that it is impossible for two solids to be in the same place at the same time, and further that by the same argument the other capacities and natures would also be in the perceptibles and none would exist separately. **1076^{b}1**

This has been said already, but in addition it is evident that it is impossible on this view for any body whatever to be divided; for it would have to be divided at a plane, and the plane at a line, and the line at a point, so that if the point cannot be divided, neither can the line, and if the line cannot, neither can the others. What difference, then, does it make whether these [perceptible points and lines] are natures of this indivisible sort, or, without being such themselves, have such natures in them? For the result

560. 1069^{a}34–36.
561. 13.6–9.
562. Part of P4 998^{a}7–19.

will be the same; for if the perceptibles are divided, the others will be divided too, or else the perceptibles will not be divided either.

But then again it is not possible for such natures to exist separately. For if there are to be solids beyond the perceptible ones, separate from them, and prior to the perceptible ones, it is clear that beyond the planes there will necessarily also be distinct and separate planes, as well as points and lines (for the same argument applies). But if this is so, beyond the planes, lines, and points of the mathematical solid there will again be others that are separate (for incomposites are prior to composites, and if indeed there are non-perceptible bodies prior to the perceptible ones, by the same argument there are also planes that are intrinsic beings and are prior to those in the immovable solids[563]), so that these lines and solids are distinct from those that exist together with the separate solids; for the latter exist together with the mathematical solids, while the former are prior to the mathematical solids. Again, therefore, there will be lines belonging to these planes, and prior to them there will need to be distinct lines and points, because of the same argument. And prior to the points in the prior lines there will be distinct prior points, though there will be no others prior to these.

The accumulation, then, becomes absurd. For we get one lot of solids beyond the perceptible ones; three lots of planes beyond the perceptible ones—those beyond the perceptible ones, those in the mathematical solids, and those beyond the ones in those solids; and four lots of lines, and five lots of points.[564] So with which of these will the mathematical sciences be concerned? Certainly not with the planes, lines, and points in the immovable solids; for a science is always concerned with what is prior.

And the same argument also applies to numbers; for beyond each lot of points there will be distinct units, and indeed beyond each lot of beings (beyond the perceptible ones, and again beyond intelligible ones), so that there will be unlimited kinds of mathematical numbers.

Further, how is it possible to resolve the precise issues also gone over in the discussion of puzzles?[565] For the objects of astronomy will be beyond the perceptibles in the same way as the objects geometry is about. But how is it possible for there to be a heaven and its parts [beyond the perceptible one], or anything else with movement? It is the same way with the objects of optics and of harmonics; for there will be both voice-able sound and seeable thing beyond the perceptible and particular ones. So it is clear that the same also holds of the other sorts of perception and the other

563. I.e., the mathematical ones.

564. The four lots of lines are (1) the one in the perceptible plane that is part of the perceptible solid; (2) the one in the mathematical plane that is part of the mathematical solid; (3) the one in the mathematical plane that is not part of but prior to the mathematical solid; and (4) the one that is not part of but prior to the mathematical plane that is not part of but prior to the mathematical solid. There are five lots of points for cognate reasons.

565. Part of P4 997ᵇ12–34.

perceptibles; for why of this one more than that one? But if that is the case, there will also be animals [beyond the perceptible ones], if indeed there are sorts of perception.

Further, there are certain propositions stated by the mathematicians that are universal and go beyond these substances. Here too, then, there will be another intermediate substance separate both from the Forms and from the intermediates, that is neither number nor point nor magnitude nor time. And if this is impossible, it is clear that it is also impossible for the others to exist separate from the perceptibles.

And, in general, conclusions follow that contradict both the truth and the things it is usual to suppose are the case, if one posits that the objects of mathematics exist in this way, as certain natures that are separate. For because they exist in this way they must be prior to perceptible magnitudes, but in fact they are posterior; for incomplete magnitude, while prior in coming to be, is posterior in substance, as the inanimate is to the animate.[566]

Further, in virtue of what precisely[567] will a mathematical magnitude be one? For the things that exist here are one in virtue of soul or a part of soul or something else that is reasonable.[568] But if a thing is not like that, it is many and is split into parts. But a mathematical magnitude is divisible and quantitative, so what is the cause of its being one and holding together?

Further, their comings to be make the difficulty clear. For first length comes to be, then breadth, finally depth, and then it is complete. If, then, what is posterior in coming to be is prior in substance, the body will be prior to the plane and the line. And in this way too it is more complete and more of a whole, because it becomes animate. But how could a line or a plane be animate? Indeed, the proposition would go beyond [the reach of] our perceptions.[569]

Further, a body is a sort of substance (for it already has completeness in a way). But how can lines be substances? Neither as a form or shape, like the soul (if indeed it is something of this sort), nor as matter is, like the body; for nothing is seen that is capable of being composed of lines or planes or points, though if these were some sort of material substance, things would have been seen that are capable of this.

Grant, then, that they are prior in account. Still not everything that is prior in account is prior in substance too. For those things are prior in substance to others which, when separated, surpass them in being, while things are prior in account to those things whose accounts are composed of their accounts. And these do not [necessarily] apply together. For if affections are not beyond the substances (for example, moving or pale), the pale is prior to the pale human in account but not in substance; for it does not admit of being separated, but is always together with the compound (and by "the compound" I mean the human who is pale), so that it is evident that

566. 1077^{a}24–^{b}11.
567. Reading τίνι ποτ'.
568. Reading ἢ ἄλλῳ τινὶ εὐλόγῳ.
569. 1077^{a}36.

neither is what results from abstraction prior nor is what results from an addition posterior; for it is from an addition to the pale that the pale human is said of things.

It has been adequately stated, then, that the objects of mathematics are not substances more than bodies are, that they are not prior to perceptibles in being but only in account, and that it is not possible for them to be in any way separated. But since it was not possible for them to exist in perceptibles either, it is evident that either they do not exist at all, or they do so in a certain way, and because of this they do not exist unconditionally; for things *are* in many ways, we say.

13.3
The Way Objects of Mathematics Do Exist

For just as the universal propositions of mathematics are not about separate objects that exist beyond the magnitudes and the numbers, but are about magnitudes and numbers, although not insofar as they are such as to have magnitudes or to be divisible, it is clearly possible that there should also be statements and demonstrations concerning perceptible magnitudes, although not insofar as they are perceptible but insofar as they are of such-and-such a sort. For just as there are many statements about things only insofar as they are moving, separate from what each of them is and from their coincidents, and since it is not necessary because of this for there to be either a movable thing separate from the perceptible ones or some such nature distinguishable in them, so too in the case of movable things there will be statements and sciences concerning them, not insofar as they are movable, but only insofar as they are bodies, or again only insofar as they are planes, or only insofar as they are magnitudes, or only insofar as they are divisible, or are indivisibles having position, or are indivisibles.

So, since it is true to say unconditionally not only that separable things exist but also that inseparable ones do (for example, that movable things exist), it is also true to say unconditionally that the objects of mathematics exist, and that they are such as they are said to be. And just as it is also true to say unconditionally of the other sciences that they are of this or that, not of what is coincidental to it (for example, not of pale, if the healthy thing is pale and the science is of being healthy) but of the thing that each is of (of being healthy if [it is concerned with someone] insofar as he is healthy, of human if insofar as he is human), so it is too with geometry. If the things it is of are coincidentally perceptible, but it is not of them insofar as they are perceptible, the mathematical sciences will not[570] be of perceptibles—nor, however, will they be of other things separate from perceptibles.

Many coincidents belong intrinsically to things insofar as they are, each of them, of a certain sort—for example, insofar as the animal is female and also insofar as it

570. Reading οὐ.

is male, there are affections special to it (and yet there is no male or female separate from the animals). So there are also such affections of things only insofar as they are lengths or insofar as they are planes. And to the extent, therefore, that [a science] is concerned with what is prior in account and simpler, to that extent the more exactness it has (and this is what simplicity does). So there is more exactness without magnitude, certainly, than with magnitude, and most without movement, but if there is movement, there is most with the primary movement; for this is the simplest, and of this the one that is uniform.

The same account also applies to harmonics and optics; for neither gets a theoretical grasp on a thing insofar as it is a voice-able sound or a seeable thing but insofar as it is lines and numbers (these being affections that properly belong to the former things). And mechanics is the same way.

So if one posits things as separated from their coincidents and investigates them as such, one will not falsify anything because of this, any more than when one draws a line on the ground and calls it "a foot long" when it is not a foot long; for the falsification is not included among the premises.

The best way of getting a theoretical grasp on a given thing would be this: if one posits as separate what is not separate, in precisely the way the arithmetician and the geometer do. For the human insofar as he is human is one and indivisible. And the arithmetician assumes him to be one and indivisible, and then gets a theoretical grasp on what is coincident with a human insofar as he is indivisible, while the geometer gets such a grasp on him neither insofar as he is human nor insofar as he is indivisible but insofar as he is a solid. For it is clear that the affections that would belong to him even if he were somehow not indivisible can still belong to him without these. So, because of this, the geometers speak correctly, and it is about beings that they speak, and these are beings; for being is twofold: on the one hand, actual, on the other, in the material way.[571]

Since the good and the noble are distinct, however (for the good is always found in action, while the noble is found also in immovable things), those who assert that the mathematical sciences say nothing about the noble or the good are speaking falsely. For these sciences say and prove these, and in the highest degree; for if they do not name them, but prove their works and their accounts, it does not follow that they are not saying anything about them. For the chief forms of the noble are order, proportion, and definiteness, which are what the mathematical sciences prove in the highest degree. And since, at any rate, these (I mean, for example, order and definiteness) are manifestly causes of many things, it is clear that they would say that this sort of cause—the noble—is also a cause in a certain way. But we will speak more explicitly about this elsewhere.[572]

571. I.e., potentially (1042^{a}27–28).
572. No such discussion is extant.

13.4
The Socratic Origins of the Theory of Forms; 1.6–9 Partly Recapitulated

About the objects of mathematics, then, that they are beings and in what way they are beings and in what way they are prior and in what way not prior, let this much be said. As regards the Forms, one must first investigate the notion of a Form, not connecting it in any way with the nature of the numbers, but in the way those who first said that there are Forms took it to be at the start.

The belief in Forms occurred to the people who stated it because as regards the truth they were persuaded by the Heraclitean arguments that all perceptible things are always flowing, so that if indeed there is to be scientific knowledge of anything and wisdom, there must be some other natures, beyond the perceptible ones, that are permanent; for there is no scientific knowledge of the flowing ones.

Socrates, though, busied himself about the virtues of character, and in connection with these was the first to inquire about universal definition (for among the natural scientists Democritus latched onto this only a little, and defined, after a fashion, the hot and the cold, while the Pythagoreans had previously done this for a few things, whose accounts they connected to numbers—for example, what opportune is, or the just, or marriage). It was reasonable that Socrates was inquiring about the what-it-is;[573] for he was inquiring in order to deduce, and the what-it-is is a starting-point of deductions; for at that time there was not yet the strength in dialectic that enables people, even separately from the what-it-is, to investigate contraries, and whether the same science is a science of contraries;[574] for there are two things that may be fairly ascribed to Socrates, inductive arguments and universal definition, both of which are concerned with a starting-point of scientific knowledge. However, while Socrates did not make the universals separable nor the definitions, the others did separate them, and these were the sorts of beings they called "Forms," so that it followed for them, pretty much by the same argument, that there are Forms of all things that are spoken of universally.

And so the result was[575] much the same as if a person who wished to count the beings were to think that he would not be able to do it while there were so few of them, but, having made more, would then count them; for the Forms are (one might almost say) more numerous than the perceptible particulars, yet it was in inquiring about the causes of these that they proceeded from them to the Forms; for in each case there is something that has the same name[576] and is beyond the substances, and also in the case of the others there is a one over many, both over those that exist

573. *EE* 1216b2–16.
574. 996a18–21 (part of P1).
575. 1078b34–1079b3 = 990b2–991b8.
576. Reading ὁμώνυμόν τι (990b5–6).

here and over the eternal ones. Further, of the ways in which it is proved that there are Forms, none makes these evident; for from some no deduction is necessarily generated, while from some others Forms are also generated of things of which they think there are no Forms. For, in accord with the arguments from the sciences, there will be Forms of all things of which there are sciences, and in accord with the one over many there will be Forms even of negations, while in accord with the argument that there is understanding of a thing that has passed away there will be Forms of things that pass away; for there is an appearance of them. Further, of the most exact of the arguments, some produce Forms of relatives, of which they say there is not an intrinsic kind, while others introduce the third man.

And, in general, the arguments for the Forms do away with the things that those accepting Forms prefer to the existence of the Forms; for it follows that it is not the dyad that is primary but number, that prior to number is the relative, and that this is prior to the intrinsic, and all the other things that certain people, by following out the beliefs held about the Forms, have accepted contrary to the starting-points.

Further, by the supposition according to which they say that there are Forms, Forms will exist not only of substances but also of many other things (for the intelligible object is a one not only in the case of substances, but also in the case of non-substances, and there are sciences not only of substance), and countless other such difficulties arise. But according to the necessities of the case and to the beliefs held about them, if the Forms are to be participated in, there must be Forms of substances only; for they are not participated in coincidentally, but rather a thing must participate in each in this way, insofar as it is not said of an underlying subject (I mean, for example, if something participates in double-itself, it also participates in the eternal, but does so coincidentally; for it is coincidental to the double that it is eternal), so that the Forms will be substance. But it is the same things that signify substance here as over there—or what will it mean to say that there is something beyond these things here, the one over the many? And if the Forms and the things that participate in them have the same form, there will be something common to them (for why should the two be one and the same[577] in the case of the twos that pass away, and in the many eternal twos, rather than in the case of two-itself and some particular two?); but if they do not have the same Form, they would be homonymous, just as if someone were to call Callias and a wooden statue a "man," seeing no commonality between them.

But if we are to posit that in other respects the common accounts apply to the Forms—for example, that plane figure and the rest of the parts of the account apply to the circle-itself, but the what-it-is must be added, we should investigate whether this is not entirely empty.[578] For to what is this to be added? To center, to plane, or to all the parts? For all the things in the substance are Forms—for example, human and

577. Reading τὸ δυὰς ἓν καὶ ταὐτόν.
578. 997^{b}5–12.

two-footed. Further, so-and-so-itself must, just like the plane, be some sort of nature that will be present in all the Forms as their kind.

13.5
What the Forms Contribute to Perceptibles: 1.9 Partly Recapitulated

Above all, one might go through the puzzles of what precisely the Forms contribute to perceptibles, either to those that are eternal or to those that come to be and pass away. For they are not the causes of movement or of any change whatever in them. But then they are also of no help at all either as regards the scientific knowledge of the other things (for they are not their substance; for otherwise they would be in them), or in regard to their being, if they are not present in the things that participate in them; for if they were, they might perhaps seem to be causes in the way that what is white is a cause when mixed with a white thing. But this account is all too readily upset—it is one that first Anaxagoras and later Eudoxus stated (in going through the puzzles), and also certain others (for it is easy to collect many impossibilities against a belief of this sort).

But then neither is it possible to say, in any of the familiar ways of speaking, that the other things come from the Forms. To say that the Forms are paradigms and that the other things participate in them is to utter empty words and poetic metaphors. For what is it that, looking to the Forms, is doing the work? It is possible for anything both to be and come to be without being copied from something, so that whether Socrates exists or not, someone could become like Socrates. And the same would clearly hold even if Socrates were eternal. Also, there will be more than one paradigm for the same thing, and so more than one Form—for example, the Forms of the man will be the animal and two-footed, as at the same time will be man-itself. Further, the Forms will be paradigms not only for the perceptibles but also for themselves—for example, the kind, as kind of the several forms. So the same thing will be paradigm and copy.

Further, it would seem to be impossible for the substance and that of which it is the substance to be separate. So how could the Forms, being the substances of things, be separate from them?

In the *Phaedo*, however, it is said in this way: the Forms are causes both of the being and of the coming to be of things. And yet if the Forms exist, things would still not come to be unless there was a mover. Also, many other things come to be—for example, a house or a ring—of which they say there are no Forms. So it is clear that it is also possible for the things of which they say there are Forms both to be and to come to be through the same causes as the things mentioned just now, but not because of the Forms. But in the case of the Forms it is possible, both in this way and by more logico-linguistic and more exact arguments,[579] to collect many objections like those considered.

579. 990b15.

13.6
Numbers as Separable Substances: Pythagoreans and Platonists

Since these issues have been determined, it is well to get a theoretical grasp again on the consequences in the case of numbers for those who say that they are separable substances and primary causes of the beings.

If number is indeed a sort of nature and its substance is nothing other than just number, as some people say, one of two things necessarily follows. Either there is a first in it and a successor, each being distinct in form, and this applies directly to the units, and any unit is non-combinable with any other unit. Or units are all directly successive and any combinable with any, as they say is the case with mathematical number (for in mathematical number no unit differs in any way from any other). Or some units are combinable and some are not. Suppose, for example, that two is first after one, and then three, and in this way, then, the rest of the numbers, and the units in each number are combinable (for example, those in the first two numbers are combinable with each other, and those in the first three numbers with each other, and likewise in the case of the other numbers), while the units in the two-itself are non-combinable with those in the three-itself, and likewise with the other successive numbers. That is why mathematical number is counted, after one, two (which includes another one), and then three (which includes another one in addition to those two), and the rest likewise, while this second sort of number is counted, after one, a distinct two (which does not include the first one), and a distinct three (which does not include two), and similarly with the other numbers. Or one sort of number is like the first mentioned, another is like the sort the mathematicians speak about, and a third like the sort mentioned last.

Further, these sorts of numbers must either be separable from things or not separable but in perceptibles (not, however, in the way we first investigated,[580] but in such a way that the perceptibles are composed of numbers that are present in them), or some are and some not, or all are. **1080^{b}1**

These, then, are of necessity the only ways in which numbers can exist. And of those who say that the one is starting-point, substance, and element of all things, and that number is composed of it and something else, pretty much everyone has described them in one of these ways (except that no one has said that all units are non-combinable). And this has occurred reasonably; for no further way is possible beyond those mentioned.

Some say, then, that both sorts of numbers exist, the sort with a before and after being Forms, and mathematical number being beyond the Forms and the perceptibles, and both being separable from the perceptibles. But others[581] say that only mathematical number exists, and is the first of the beings, separate from the

580. 1076^{a}38–^{b}11.
581. Speusippus (1028^{b}21–24).

perceptibles. And the Pythagoreans too say that there is one sort, the mathematical, except they say that it is not separate, but rather perceptible substances are composed of it; for they construct the whole heaven from numbers, except not numbers composed of units; rather, they suppose the units to have magnitude. But how the first one was composed so as to have magnitude they seem at a loss to say.

Another thinker[582] says that the first sort of number, Form number, alone exists, and some say that mathematical number is the same as this.

It is the same way as regards lines, planes, and solids. For some people[583] think that those that are the objects of mathematics and those that come after the Forms are distinct. But of those who say otherwise some speak of the mathematical numbers in a mathematical way (those who do not make the Forms numbers or say that the Forms exist[584]), while others[585] speak of the mathematical numbers but not in a mathematical way; for they say that not every spatial magnitude is divisible into magnitudes, and that not just any two units make two. All those who say that the one is an element and starting-point of the beings assume numbers to be composed of units, except the Pythagoreans, who say they have magnitude, as was said previously.[586]

In how many ways it is possible to speak of numbers, then, and that all the ways have been mentioned, is evident from these considerations. They are all impossible, but some perhaps more than others.

13.7
Plato on Units

First, then, whether the units are combinable or non-combinable must be investi-
1081ᵃ1 gated, and if non-combinable, in which of the ways we distinguished.[587] For it is possible for any unit to be non-combinable with any unit, and it is also possible for those in the two-itself to be non-combinable with those in the three-itself, and in this way, then, for those in each of the first [or Form] numbers to be non-combinable with each other.

If all units are combinable and without difference, it is mathematical number that results, and this one only, and the Forms cannot be the numbers. (For what sort of number will man-itself or animal-itself or any other Form be? For there is one Form of each thing—for example, one of man-itself and another of animal-itself. But the similar and undifferentiated numbers are unlimitedly many, so that this three is no

582. Identity unknown.
583. Including Plato (992ᵇ13–18).
584. Speusippus and the Pythagoreans.
585. Xenocrates (as at 1080ᵃ22), but also Plato, whose indivisible lines are a case in point (992ᵃ20–22).
586. 1080ᵇ19.
587. 1080ᵃ18–20, 23–35.

more man-itself than any other three.) But if the Forms are not numbers, they cannot exist at all either. (For from what starting-points will the Forms come? For number comes from the one and the indefinite dyad, and the starting-points[588] and elements are said to be starting-points and elements of number, and so the Forms cannot be ranked as either prior or posterior to the numbers.)

But if units are non-combinable, so that none is combinable with any other, this sort of number cannot be mathematical number (for mathematical number is composed of undifferentiated units, and the things proved about it fit it as such). But it cannot be Form number either. For the two will not be the first thing to come from the one and the indefinite dyad, followed by the successive numbers, in the way that two, three, four . . . are said—for the units in the first two are generated at the same time, whether, as the first person [to introduce Forms] said, when the unequals have been equalized,[589] or in some other way. Besides, if[590] one unit is to be prior to the other, it will also be prior to the two composed of these; for whenever one thing is prior and another posterior, a thing composed of both of them will be prior to the latter and posterior to the former.

Further, since the one-itself is first, and then there is a one that is first among the others but second after it, and again a third, second after the second one and third after the first one, so that the units would be prior to the numbers after which they are named—for example, there will be a third unit in two before three exists,[591] and a fourth in three, and a fifth, before these numbers exist.

None of these thinkers has said that the units are non-combinable in this way, but in accord with their starting-points even this way of doing it is reasonable, although in accord with the truth it is impossible. For it is reasonable for units both to be prior or posterior if indeed there is a first unit and a first one, and similarly with twos, if indeed there is a first two; for after the first it is reasonable, indeed necessary, for there to be a second, and if a second, a third, and so on with the others in succession. (But to say both things at the same time, that a unit is first and another unit is second after the one, and also that two is first after it, is impossible.) But these thinkers make a first unit, and a first one, but not after that a second and a third, and a first two, but not after that a second and a third.

It is evident too that it is not possible if all units are non-combinable for there to be a two-itself and a three-itself, and so on with the other numbers. For whether units are undifferentiated or different from each other, number must be counted by addition—for example, two by adding another one to the one, three by adding another one to the two, and four similarly. But if this is so, numbers cannot come to be in the way

588. Reading καὶ αἱ ἀρχαὶ.
589. 1083^{b}23–25, 1091^{a}24–25.
590. Reading ἔπειτα εἰ.
591. The number 1 maps onto unit 1: $N_1 \rightarrow U_1$. The number 2 onto two new units: $N_2 \rightarrow U_2+U_3$. At that point we already have three units (U_1, U_2, U_3), but the number 3 has yet to be constructed.

these thinkers generate them from the dyad and the one. For two becomes part of three and three of four, and the same happens in the case of the succeeding numbers. But [on their view] four comes from the first two and the indefinite dyad—two twos beyond the two-itself. Otherwise two-itself will be part of four, and one other two will be added. And two will also come from the one-itself and another one. But if so, the other element cannot be the indefinite dyad; for it generates one unit, not a definite two. Further, beyond the three-itself and the two-itself how can there be other threes and twos? And in what way are they composed of prior and posterior units? In fact all this is absurd and fabricated, and it is impossible for there to be a first two and then a three-itself. Yet there must be, if indeed the one and the indefinite dyad are to be elements. But if the consequences are impossible, it is also impossible for these to be the starting-points.

If, then, any unit is differentiated from any other, these and other similar things necessarily follow. If, however, the units in different numbers are differentiated, and only those in the same number are undifferentiated from each other, even so the difficulties that follow are no less.

1082a1 For example, in the ten-itself there are ten units, and the ten is composed both of them and of two fives. But since the ten-itself is not some random number or composed of any random fives (or of any random units either), the units in this ten must differ. For if they do not differ, neither will the fives of which the ten is composed. But since these differ, the units will also differ. But if they differ, will there be no other fives present in the ten but only these two, or will there be others? If there are not, it is absurd. But if there are, what sort of ten will be composed of them? For there is no other ten present in the ten apart from itself. But then it is in fact necessary [on their view] that the four not be composed of any random twos; for the indefinite dyad, they say, by taking on the definite two produced two twos; for it was a two-maker of what it took on.

Further, how is it possible for the two to be a sort of nature beyond the two units, or the three beyond the three units? For either it is by one thing's participating in the other,[592] as there is a pale human beyond pale and human (for it participates in them), or else when one is some difference in the other, as the human is beyond animal and two-footed.

Further, some things are one by contact, some by mixture, some by position, but none of these can belong to the units of which two or three is composed. But rather, just as two men are not some one thing beyond both of them, so the same must also hold of the units. And their being indivisible will make no difference; for while points too are indivisible, nonetheless a pair of points is not another thing beyond the two of them.

Neither should one overlook this, that it follows that there are prior and posterior twos, and similarly with the other numbers. For grant that the twos in the four are

592. Reading θατέρου θατέρου.

simultaneous with each other. Yet these are prior to those in the eight, and just as the two generated them, they generated the fours in the eight-itself. So if the first two is a Form,[593] these twos will themselves be Forms of some sort. And the same account also applies to the units; for the units in the first two generate the four units in the four. So all the units become Forms and a Form will be composed of Forms. So it is clear that the things of which these are in fact the Forms will also be composite—so, for example, one might say that the animals are composed of animals, if there are Forms of them.

In general, to differentiate the units in any way is absurd and fabricated (and by "fabricated" I mean forced to fit with a hypothesis); for neither in quantity nor in quality do we see unit differing from unit, and number must be either equal or unequal (all number but especially the sort composed of units), so that if one number is neither greater nor less than another, it is equal to it. But things that are equal and wholly undifferentiated are supposed to be the same in the case of numbers. Otherwise, not even the twos in the ten-itself will be undifferentiated, though they are equal; for what cause will someone have for saying that they are undifferentiated? **$1082^{b}1$**

Further, if every unit plus another unit makes two, a unit from the two-itself and a unit from the three-itself will make a two, which will thus be composed of differentiated units, and so will it be prior to the three or posterior? It seems, rather, that it must be prior; for one of the units is simultaneous with the three and the other is simultaneous with the two. And we, for our part, suppose it that one plus one, whether the things are equal or unequal, is two—for example, the good plus the bad or human plus horse. But for those who say the things under consideration this does not hold even of units.

If the three-itself is not a larger number than the two, it is a wonder, but if it is larger, it is clear that there is a number in it equal to the two, so that it is undifferentiated from the two-itself. But this is not possible, if there is a first and a second number.

And the Forms will not be numbers either. For on this particular point those people are correct who say that the units must be different if indeed there are to be Forms, as was said previously;[594] for the Form is one, while if the units are not different, the twos and threes will also be undifferentiated.

That is also why it is necessary for them to say that when we count this way—one, two, . . .—we do not proceed by adding to the number that already exists (for the generation will not in that case be from the indefinite dyad, nor can a number be a Form; for then one Form will be present in another and all the Forms will be parts of one Form). And so with a view to their hypothesis they speak correctly but, taken as a whole, incorrectly; for they do away with too many things—although they will say that this question itself involves a puzzle, whether, when we count and say "one,

593. Reading ἰδέα.
594. $1081^{a}5$–17.

two, three," we count by addition or by separate parts.[595] But in fact we do it in both ways; that is why it is ridiculous that this difficulty should lead to so great a difference of substance.

13.8
Speusippus, Xenocrates, the Pythagoreans: Numbers as Separable Intrinsic Beings (1)

1083a1 First of all it is well to determine what the difference is in a number, and in a unit, if there is one. Units must differ either in quantity or in quality, but neither of these seems to admit of belonging[596] to units. But number insofar as it is number differs in quantity. If, then, the units too did differ in quantity, number would differ from number even when equal in quantity of units. Further, are the units greater or smaller, and do the later ones increase, or the contrary? All these are unreasonable. But they cannot differ in quality either. For no affection can belong to them; for to numbers too, they say, quality belongs posterior to quantity. Further, quality could not come to them either from the one or from the dyad; for the former is no quality, and the latter is quantity-producing; for this nature is what causes the beings to be many. Therefore, if units differ in some other way, they must state this at the start especially, and determine the difference in a unit, and especially why it must belong [to units]. Otherwise what difference are they talking about?

It is evident, then, that if indeed the Forms are numbers, the units cannot all be combinable, nor can they be non-combinable with each other in either of the two ways.[597]

But the way that some other people[598] speak about numbers is not correct either. These are the people who think that Forms do not exist, whether unconditionally or as being certain numbers, but that the objects of mathematics do exist, that the numbers are primary among the beings, and that the starting-point of them is the one-itself. For it is absurd for there to be, as they say, a one that is primary among the ones, but not a two among the twos, or a three among the threes; for the same argument applies to them all. If, then, what holds of the numbers is like this, and someone posits that mathematical number alone exists, the one is not a starting-point (for the sort of one that the one is must differ from the other units; and, if this is so, there must also be a two that is primary among the twos, and similarly with the other successive numbers). But if the one is the starting-point, what holds of the numbers must rather be as Plato used to claim, and there must be a first two and three, and

595. I.e., by putting the things to be counted (the separate parts) into one-to-one correspondence with the natural numbers.
596. Reading ὑπάρχειν.
597. This concludes the discussion of Plato in particular.
598. E.g., Speusippus.

the numbers must not be combinable with each other. But if one posits this, many impossible results follow, as was said.[599] But then one or the other must hold, so that if neither does, number cannot be separable.

It is also evident from this that the third version[600] is the worst, in which Form number and mathematical number are the same number. For of necessity two errors then meet in one notion; for, first, mathematical number cannot possibly be this way; on the contrary, special hypotheses[601] must be posited to keep the view going, and, second, all the things that follow for those who speak of number as Form must also be accepted.

The Pythagorean version in one way has fewer difficulties than those mentioned, but in another way has others special to itself. For by not making number separable many of the impossibilities are done away with; but for bodies to be composed of numbers, and for this number to be mathematical, is impossible. For it is not true to say that there are indivisible spatial magnitudes, but even if it were true that they were fully this way, units at least have no magnitude—and how can a magnitude be composed of things that are indivisible? Moreover, arithmetical number, at any rate, is composed of units, while these thinkers say that the beings are numbers—at any rate, they apply their speculations to bodies on the supposition that the latter beings are composed of numbers.

If, therefore, it is necessary, if indeed number is an intrinsic being, for it to exist in one of the ways mentioned, and if none of these is possible, it is evident that number has no such nature as is furnished for it by those who make it separable.

Further, is each unit composed of the great and the small when they are equalized, or one of the small, another of the great? If the latter, each is not composed of all of the elements, nor will the units be undifferentiated (for in one the great belongs and in another the small, which is contrary in nature to the great).[602]

Further, how about the units in the three-itself? For one is left over.[603] But perhaps it is because of this that they make the one-itself the middle place in the odd numbers. And if each of its units is composed of both the great and the small equalized, how will the dyad, which is one nature, be composed of them? Or how will it differ from the unit?

Further, the unit is prior to the dyad (for when it is done away with, the dyad is done away with). It must, then, be the Form of a Form, because it is prior to a Form,

599. $1080^{b}37$–$1083^{a}17$.

600. That of Xenocrates.

601. $1090^{b}29$–30.

602. This is the first in a series of arguments, ending at $1086^{a}21$, directed against theories of numbers as separable intrinsic beings. These fall into five groups: how number is produced from the material starting-point (the indefinite dyad); how many Form numbers there are; the nature of the one; the starting-points of geometrical objects; and the difficulty of generating numbers from the one and multiplicity, or spatial magnitudes from similar starting-points.

603. The great and the small, as the dyad, is a two-maker of what it receives ($1082^{a}14$–15), and so cannot generate the one that is in the three-itself.

at any rate, and comes to be before it. From what, then? For the indefinite dyad[604] is a two-maker.

Further, number must be either limited or unlimited; for these thinkers make the numbers separable, so that it is not possible for neither of these not to belong to them. But that it is assuredly not possible for it to be unlimited is clear (for an unlimited number is neither odd nor even, but the generation of numbers is always of an odd number or of an even one—in one way, when the one applies to an even number, an odd number is produced; in another way, when the dyad applies, the numbers got from the one by doubling are produced; in another way, when the odd numbers apply, the other even numbers).

Further, if every Form is a Form of something, and the numbers are Forms, the unlimited number will be the Form of something, either of a perceptible or of something else. And yet this is not possible either in accord with their hypothesis or in accord with reason—but they do organize the Forms this way.

But if number is limited, how far does it go? With regard to this not only the that but also the why should be stated. But surely if the number series goes up to ten, as some people say, first the Forms will soon run out—for example, if three is man-itself, what number will horse-itself be? For a number that is a given thing-itself [is in a series that] goes up to ten. It must, then, be one of the numbers among these (for it is these that are substances and Forms). [But even if it is], nonetheless, they will run out (for the Forms of the animal will exceed them).

At the same time, it is clear that if it is in this way that the three is man-itself, the other threes are also (for those in the same numbers are similar), so that there will be an unlimited number of men—if each three is a Form, each will be man-itself; if not, they will all, at any rate, be men.

Also, if the smaller number is part of the greater (number that is composed of the combinable units present in the same number), then, if the four-itself is a Form of something (for example, horse or pale), man will be part of horse, if man is two.

It is absurd too for there to be a Form of ten but not of eleven or of the succeeding numbers.

Further, there both are and come to be things of which there are no Forms. So why are there not Forms of these too? Therefore, the Forms are not causes.

Further, it is absurd if the number series up to ten is a being and a Form to a higher degree than the ten-itself, and yet there is no generation of it as one thing, while of the latter there is. But they proceed on the assumption that the series up to ten is a complete number series. At any rate, they generate the derivative things—for example, the void, proportion, the odd, and other things of this sort—within the decad; for some things they assign to the starting-points—for example, movement, rest, good, bad—and the others to the numbers. That is why the odd is identified with the one; for if it was in the three, how could the five be odd?

604. I.e., the great and the small.

Further, spatial magnitudes and all such things go up to a certain number—for example, there is the first, the indivisible, line, then two, then the rest up to ten. **1084ᵇ1**

Further, if number is separable, one might raise a puzzle as to whether the one is prior, or the two or the three. Insofar, then, as the number is composite, the one is prior, but insofar as the universal and the form is prior, the number is prior; for each of the units is a part of the relevant number as its matter and the number is its form. And in a way the right angle is prior to the acute, because it is definite and because of its account, but in a way the acute is prior, because it is a part—that is, the right angle is divided into acute angles. As matter, then, the acute angle, the element, and the unit are prior, but as regards the form and the substance that is in accord with the account, the right angle, and the whole composed of the matter and the form, are prior; for what is both is closer to the form and to what the account is of, though posterior in coming to be. In what way, then, is the one a starting-point? Because it is not divisible, they say. But both the universal and the part or the element are indivisible, although they are starting-points in different ways, one in account and the other in time. In which of these ways, then, is the one a starting-point? For, as was said, the right angle seems to be prior to the acute, and the acute to the right, and each is one. They, then, make the one a starting-point in both ways. But this is impossible; for in one way it is a starting-point as form or substance, but in the other it is as part or as matter. For it is [only] in a way that each of the two is one, [since] in truth it is potentially (if, at any rate, the number is one and not like a heap, and if a distinct number is composed of distinct units, as they say) but not actually that each of the two is one.

And the cause of the error they fell into is that they were conducting their hunt [for starting-points] at the same time from the side of mathematics and from that of universal accounts. So from the former side they posited the one, the starting-point, as a point (for a point is a unit without position), and—just as some others have done—they put together the beings from the smallest things. So the unit becomes the matter of the numbers, and at the same time prior to the two—but also posterior, the two being treated as a whole, a one, and a Form. But because they were inquiring about the universal they treated the predicable one as also a part in this way. But these characteristics cannot belong at the same time to the same thing.

If the one must merely be without position (for it differs in no way [from other ones] except that it is a starting-point), and the two is divisible but the unit is not, the unit would be more like the one-itself. But if the unit is more like it, it must also be more like the unit than like the two. So each of the units [in the two] must be prior to the two. But this is something they deny—at any rate, they generate the two first.

Further, if the two-itself is a one and the three-itself is also a one, both together are a two. Of what, then, is this two composed? **1085ᵃ1**

13.9
Numbers as Separable Intrinsic Beings (2); Forms as Universals and Particulars

One might raise a puzzle—since in fact there is no contact in numbers but succession of units between which there is nothing, for example, between those in the two or in the three—as to whether these succeed the one-itself or not, and whether it is the two that is prior in succession or one of the units in it.

Similar difficulties also occur concerning the kinds of things that are posterior to number—line, plane, and body. For some people generate these from the forms of the great and the small—for example, lines from the long and short, planes from broad and narrow, and solids from deep and shallow (these being forms of the great and small). And the starting-point that corresponds to the one different thinkers describe in different ways. And here too it is evident that there are innumerable impossibilities, and fabricated things, and things that are contrary to all reason. For [the forms] are divorced from each other, unless their starting-points in fact mutually imply each other, so that the broad and narrow are also the long and short. But if this is so, the plane will be a line and the solid a plane. Further, what account will be given of angles, figures, and things of this sort? For the same happens here as with number; for these[, long and short,] are affections of magnitude, but magnitude is not composed of these, any more than the line is composed of straight and curved, or solids of smooth and rough.

Common to all these cases is precisely the same puzzle as arises in the case of the several forms as forms of a kind, when someone posits[605] the universals: whether it is the animal-itself that is in the particular animal or something other than animal-itself.[606] If it is not separable, this produces no puzzle. But if the one and the numbers are separable, as those who hold these views say, it is not easy to resolve the resulting puzzle, if one is to say that the impossible is not easy. For when someone grasps with his understanding the one that is in the two, or, in general, in number, does he grasp the thing itself or something else?

Some people, then, generate spatial magnitudes from matter of this sort,[607] while others[608] do so from the point—but the point seems to them to be not one but something like the one—and from other matter, which is like plurality, but not plurality. About these, the same puzzles arise nonetheless. For if the matter is one, line and plane and solid will be the same (for what is composed of the same things will be one and the same). But if the matters are more than one and there is one for the line and
1085b1 a second for the plane and another for the solid, either they imply each other or not,

605. Reading θῇ.
606. Reading αὐτοῦ ζῴου.
607. I.e., the various forms of the great and the small (1085a9–12).
608. E.g., Speusippus.

so that the same results will follow even so; for either the plane will not contain a line or it will be a line.

Further, in what way number can come from the one and plurality they make no attempt to explain. But whatever they say the same difficulties arise as for those who generate number from the one and the indefinite dyad.[609] For while some generate number from the plurality that is predicated universally, not from a particular plurality, others generate it from a particular plurality, the primary one (for the two is said to be a sort of first plurality). So there is practically no difference, but instead the same puzzles[610] will follow for mixture or position, blending, generation, or other such things.

Most of all, however, one should inquire about what each unit is composed of, if it is one; for each unit is certainly not the same as the one-itself. It must, then, be composed of the one-itself and plurality, or a part of plurality. But to say that the unit is a plurality is impossible, because it is indivisible, while if it is composed from a part of plurality, there are many other difficulties; for each of the parts must be indivisible (or it will be a plurality and the unit will be divisible), and the elements will not be the one and plurality (for the single units are not composed of plurality and one).

Further, the holder of this view does nothing but introduce another number; for his plurality of indivisibles is a number.

Further, one must inquire also[611] of those who speak in this way whether the number is unlimited or limited. For at the start, it seems, there was a limited plurality, from which, together with the one, the finite number of units are composed. But there is also another, plurality-itself, which is unlimited plurality. Which sort of plurality, then, is an element together with the one?

One might inquire similarly about the point, that is, the element from which they generate spatial magnitudes. For surely this is not the one point that alone exists. At any rate, one should ask: What is each of the other points composed of? For it is not composed, at any rate, from some distance together with the point itself. But then there cannot be indivisible parts of a distance either, as there can be of the plurality that units are composed of; for number is composed of indivisibles, while spatial magnitude is not.

All these considerations, then, and others of the sort, make it evident that it is impossible for number and spatial magnitude to be separable. Further, the discord about numbers between the various versions is a sign that it is the things themselves not being truly grasped that produces the confusion in these versions. For those who **1086^{a}1** make mathematical objects alone exist beyond the perceptibles, seeing the difficulty and made-up nature of the Forms, abandoned Form number and made mathematical number. But those who wish to make the Forms at the same time also numbers,

609. Plato, Xenocrates.
610. 1082^{a}20–26.
611. 1083^{b}36–1084^{a}1.

but did not see how, if someone posits these starting-points, mathematical number can exist beyond Form number, made Form number and mathematical number the same in name, since in fact mathematical number has been done away with (for the hypotheses they state are special and unmathematical). But the one who first posited that Forms exist, that the Forms are numbers, and that the objects of mathematics exist, with good reason separated them. So it turns out that all these thinkers speak correctly on some issue, but, in general, are incorrect. And they themselves confirm this, since they do not say the same things, but contrary ones. The cause is that their hypotheses and starting-points are false. And it is difficult, according to Epicharmus,[612] to speak correctly from things grasped incorrectly, for as soon as it is said, it is seen to be incorrect.

As regards numbers, then, the puzzles have been gone through and the distinctions drawn are enough. For while someone who is already persuaded might be further persuaded by more, someone not yet persuaded would come no closer to being persuaded.

Concerning the primary starting-points and the primary causes and elements, however, some of what is said by those who speak only about perceptible substance has been discussed in our studies concerning nature, while some does not belong to the present methodical inquiry. But what is said by those who assert that there are other substances beyond the perceptible ones is something one needs to get a theoretical grasp on next after what has been discussed. Since, then, some people say that the Forms and the numbers are things of this sort, and that the elements of these are elements and starting-points of the beings, what they say and in what way they mean it must be investigated.

Those who posit numbers only, and these mathematical ones, must be investigated later.[613] Regarding those who accept the Forms, however, one might well at the same time get a theoretical grasp on their version and on the puzzles they face. For they at the same time make the Forms universal and contrariwise treat them as separable and as particulars. But that this is not possible is a puzzle that was gone through before.[614] The cause of the conjoining of these two characteristics in one and the same thing on the part of those who spoke of their substances as universals is that they did not make their substances the same as the perceptibles. They thought that the particulars in the realm of perceptible things were flowing and that none of them remains the same, but
1086b1 that the universal was both beyond these and something distinct from them. This, as we said in our previous discussion,[615] was stirred up by Socrates, because of his definitions, but he did not separate these from the particulars—and he understood things correctly in not separating them. This is clear from the results; for without universals it is not possible to get scientific knowledge, but separating them is the

612. Also 1010a6.
613. 1090a7–15, 1090a20–b20.
614. P12 1003a5–17, 7.13, 1084b23–32.
615. 1078b17–34.

cause of the subsequent difficulties regarding the Forms. The others, supposing that if indeed there are going to be any substances beyond the perceptible and flowing ones, it is necessary for them to be separable, had no others, but set-out the universal predicables, so that it followed that universals and particulars were practically the same natures. This in itself, then, would be one difficulty for the view just described.

13.10
The Separability of Elements and Starting-Points; the Scientific Knowability of Substances

Let us now discuss an issue that presents a certain puzzle[616] both to those who accept the Forms and those who do not, and which was stated before, at the start, when going through the puzzles. For if one does not posit substances to be separate, and in the way in which particular things are said to be separate, one will do away with the sort of substance we wish to maintain. But if one posits substances to be separable, in what way should we posit their elements and starting-points to be?

For if they are particular and not universal, there will be just as many of the beings as there are elements, and the elements will be scientifically unknowable. For suppose that the syllables in voiced sound are substances and that their elements are the elements of substances. Then there must be [only] one BA and one of each of the [other] syllables, if indeed they are not universal and the same in form, but rather each is one in number and a this something and not a thing the same in name [as something else]. (Besides, these thinkers posit the what a thing is as being in each case one.[617]) But if the syllables are this way, so too are the things they are composed of. Therefore, there will not be more As than one, or more than one of any of the other elements either, based on the same argument on which[618] in the case of the syllables there will not be more than one instance of the same one. But then if this is so, there will not be other beings beyond the elements, but only the elements. Further, the elements will not be scientifically knowable either; for they are not universal, but scientific knowledge is of universals, as is clear from demonstrations and from definitions; for a deductive proof that this triangle has [its interior angles equal to] two right angles does not come about unless every triangle has [interior angles equal to] two right angles, nor that this human is an animal, unless every human is an animal.

But if the starting-points are universal, either the substances composed of them are also universals,[619] or non-substance will be prior to substance; for the universal is not a substance, but the element or the starting-point is universal, and an element or starting-point is prior to the things of which it is an element or starting-point.

616. P12 $1003^{a}5$–17.
617. Reading ἔτι . . . ἕκαστον τιθέασιν.
618. Secluding τῶν ἄλλων.
619. Reading ἢ . . . ἢ.

All these difficulties, then, follow reasonably, when these thinkers make the Forms be composed of elements and also claim that beyond the substances that have the same form there are Forms, [each of which] is a single separate thing. But if, as in the case of the elements of voiced sound, there is nothing to prevent there being many As and Bs without there being any A-itself or a B-itself beyond the many, then, in view of this, there will be unlimitedly many similar syllables.

The fact that all scientific knowledge is universal, so that the starting-points of the beings must also be universal and not separate substances, involves the greatest puzzle of those mentioned.[620] But though there is surely a way in which what is said is true, there is another way in which it is not true. For scientific knowledge, like knowing scientifically, is twofold, one potential, the other active: the potential, being, as matter, universal and indefinite, is of what is universal and indefinite, while the activity, being definite, is of what is definite—being a this something of a this something. But it is only coincidentally that sight sees universal color, because this [particular instance of] color that it sees is a color, and so what the grammarian theoretically grasps, this [particular instance of] A is an A; since, if the starting-points must be universal, what comes from them must also be universal, as in the case of demonstrations. And if this is so, there will be nothing separable and no substance either. But it is clear that in one way scientific knowledge is universal, while in another way it is not.

BOOK 14 (NU)

14.1
Contraries Cannot Be Starting-Points

About this sort of substance, then, let this much be sufficient.

All [thinkers] make the starting-points contraries: as in natural things, so also in the case of the immovable substances. But if it is impossible for there to be anything prior to the starting-point of all things, the starting-point cannot be a starting-point by being another thing.[621] This would be as if someone were to say that the white is a starting-point, not insofar as it is another thing, but insofar as it is white, yet that it is said of an underlying subject, and that it is white by being another thing; for in that case the underlying subject will be prior. But all things come to be from contraries as belonging to some underlying subject. Therefore, an underlying subject must be present above all in the case of contraries. Therefore, all contraries are always
1087b1 said of an underlying subject and so none is separable. But just as it appears that nothing is contrary to substance,[622] so too argument testifies to this. No contrary,

620. P12 1003a5–17, P_{14} 1060b19–23.
621. 987b23.
622. *Cat.* 3b24–27.

therefore, is the starting-point of all things in the controlling way, but there is another starting-point.

But these thinkers[623] make one of the contraries matter, some making the unequal matter for the one, the equal,[624] as if inequality were the nature of plurality, and another[625] making plurality matter for the one (for the numbers are generated, for the former, from the dyad of the unequal, the great and small, and, for the latter, from plurality, but for both they are generated by the substance of the one); for even the thinker[626] who says that the unequal and the one are the elements, and that the unequal is a dyad composed of the great and the small, speaks of the unequal or the great and the small as being one, and does not draw the distinction that they are one in account but not in number. But then they do not even give a correct account of the starting-points they call "elements." Some speak of the great and the small along with the one, and treat these three as elements of the numbers, the dyad being matter, the one the shape [or form]. Others[627] speak of the many and the few, because the great and the small are more appropriate in their nature to magnitude than to number. Others[628] speak instead of the universal that is over these: the exceeder and the exceeded.

However, these variations make (one might almost say) no difference with respect to some of the consequences, but only with respect to the logico-linguistic difficulties, which these thinkers take care to avoid, because the demonstrations they themselves carry out are logico-linguistic. Except that the very same argument that makes the exceeder and the exceeded the starting-points, and not the great and the small, also makes number come from the elements prior to the two coming from them; for in both cases they are the more universal. As things stand, however, they accept one of these things but do not accept the other.

Other thinkers oppose the other and the another to the one, and others plurality to the one.[629] But if, as they wish to maintain, the beings are composed of contraries, and either there is nothing contrary to the one, or, if indeed there is going to be anything it is plurality, and if the unequal is contrary to the equal, and the other to the same, and the another to the thing itself, those who oppose the one to plurality have the view with most going for it. But even their view is inadequate; for the one will then be a few; for plurality is opposed to fewness and many to few.

It is evident, however, that the one signifies a measure. And in every case there is another thing, an underlying subject—for example, in a musical scale, it is a quarter-tone, in spatial magnitude, a finger or a foot or something else of the sort, in rhythms,

623. E.g., Plato.
624. Reading τῷ ἑνὶ τῷ ἴσῳ.
625. Speusippus.
626. Plato again.
627. Probably unknown Platonists.
628. Other unknown Platonists.
629. Probably Pythagoreans; probably Speusippus.

a beat or a syllable, and similarly in weight, some standard weight. And in all cases it
1088^a1 is the same way, in qualities it is a quality, in quantities a quantity. And the measure is indivisible, in form for qualities and perceptually for quantities, as the one is not intrinsically substance of anything. And this stands to reason; for one signifies the
5 measure of some plurality, and number signifies a measured plurality and a plurality of measures (that is why it is quite reasonable for the one not to be a number; for the measure is not measures; on the contrary, what both the measure and the one are is a starting-point). The measure, though, must always be some self-same thing belonging to all [the relevant cases]—for example, if horse is the measure, to horses, and if human, to humans, and if human or horse or god, perhaps to living being, and
10 the number of them will be a number of living beings. But if the things are human, pale, and walking, there will scarcely be a number of them, because they all belong to the same thing, which is one in number—nonetheless, there will be a number of kinds of them, or of some other such term.

Those who posit the unequal as something that is one, but the dyad as an indef-
15 inite thing composed of great and small, make claims that are very far from being plausible or possible; for the latter are affections and coincidents, rather than underlying subjects, of numbers and magnitudes—the many and the few of number and the great and the small of magnitude—just like even and odd, smooth and rough,
20 straight and curved.

Further, besides this error, the great and the small, and the other things of this sort, must be relative to something. But the relative is least of all a nature or a substance, and is posterior to quality and quantity. Also, the relative, is an affection
25 of quantity, as was said, not its matter, since another thing is [matter] for both the relative generally,[630] and for its parts and forms. For there is nothing either great or small, many or few, or, in general, relative to something that is not great or small, many or few, or relative to something, by being another thing.

A sign that the relative is least of all a substance and a being is that of it alone there
30 is neither coming to be nor passing away nor movement, as with respect to quantity there is growth and withering, with respect to quality alteration, with respect to place spatial movement, with respect to substance unconditional coming to be and passing away. But with respect to the relative there are none of these; for, without being moved or changed, a thing will be now greater and now less or equal, if the other
35 thing has moved with respect to quantity. Also, the matter of each thing, and so of
1088^b1 substance, must be what is potentially this sort of thing. But the relative is neither potentially nor actively substance. It is absurd, then, or rather, impossible, to make what is not a substance an element in, and prior to, substance; for all the categories are posterior to substance.

Further, elements are not predicated of the things they are elements of, while many
5 and few are predicated both separately and together of number, and long and short of

630. Rejecting the additions of ἢ and ὑπόκειται.

line, and both broad and narrow apply to plane. If there is a plurality, then, of which the one term, the fewness, is always [predicated],[631] such as the two (for if it were many, one would be few), there must also be a plurality that is unconditionally many, such as the ten, if there is no number that is greater than it, or ten thousand. How, then, in view of this, can number be composed of few and many? For either both should be predicated of it, or neither. As things stand, however, only one or the other is.

14.2
Eternal Things as Consisting of Elements; the One Plus Something Else as Elements; How Not Being Can Come from Being and Be Many

One should investigate in an unconditional way whether eternal things can consist of elements; for then they will have matter; for everything that is composed of elements is composite. Therefore, if something that is composed of something, even if it always exists, would of necessity, if it had come to be, also have come to be from it, and if everything that comes to be does so from something that is potentially what it comes to be (for it could not have come to be or exist from something that did not have this potential), and if what has this potential can be active or not, then however eternal number or anything else that has matter may be, it would admit of not existing, just like what lasts a single day and what lasts for so-and-so many years. But if this is so, what has existed for so long a time that it has no limit admits of not existing too. Therefore, things that consist of elements cannot be eternal, if indeed what admits of not existing is not eternal, as we have had occasion to busy ourselves about in other accounts.[632] If, however, what is being said now is true universally, that no substance is eternal if it is not activity, and if the elements are matter of what is a substance, no eternal substance can be composed of elements present in it.

But there are some people[633] who make the element that is together with the one an indefinite dyad, and reasonably object to the unequal, because of the impossible consequences. But they get rid only of those difficulties that necessarily follow as a result of making the unequal and the relative an element. But these people must also face those difficulties that arise separately from this notion, whether it is Form number they produce from these elements or mathematical number.

There are many causes that led these thinkers astray in the case of these causes, but especially the fact that they raised the puzzle in an archaic way. For they believed that all the beings would be one, namely, Being-itself, if one did not resolve, and had not

631. Reading οὗ τὸ μὲν ἀεί, τὸ ὀλίγον.
632. $1050^{b}6$–22, *Cael.* 1.12.
633. E.g., Xenocrates.

traveled to the same place as, the argument of Parmenides: "for never will this prevail, that things that are not, are."[634] Instead, they thought it necessary to prove that not being is; for only in this way, from being and something else, could the beings be composed, if they are many.

And yet, in the first place, if being [is said of things] in many ways (for it signifies sometimes substance, sometimes quality, sometimes quantity, and at other times the other categories), what sort of one, then, will all the beings be, if there is no not being? Will it be substances, or qualities, and the others likewise? Or will they all be one—the this, the of such-and-such sort, the so-and-so much, and the others that signify one something? But it is absurd—or, rather, impossible—for a single sort of nature to become the cause of a being's being a this, being of such-and-such sort, being so-and-so much, and being in a place.

Second, of what sort of not being and being will the beings be composed? For in fact not being is [said of things] in many ways, since in fact being is; and not being a human signifies not being a this, not being straight signifies not being of such-and-such sort, and not being three cubits signifies not being so-and-so much. Of what sort of being and not being, then, are the beings composed so as to be many? He[635] means the false and calls this sort of nature "not being," from which, together with being, the beings are composed so as to be many. That is why it also used to be said that something false must be assumed, as geometers assume what is not a foot long to be a foot long. But this cannot be so, for geometers do not assume anything false,[636] either, for it is not a premise of the deduction, nor is it not being in this sense that the beings come to be from or pass away into. But since there are as many cases in which things are said not to be as there are categories, and beyond these the false is said not to be, as is what *is* potentially, it is from this last one that there is coming to be—human from what is not human but is potentially human, white from what is not white but is potentially white, and similarly whether it is one thing that comes to be or many.

It is evident that their inquiry is how being in the sense of substance can be many; for the things that come to be [in their view] are numbers and lines and bodies. Yet it is absurd [for them] to inquire how being in the sense of the what-it-is can be many, but not how quality or quantity can be. For surely the indefinite dyad or the great and the small is not a cause of there being two whites, or many colors, or flavors or shapes; **1089b1** for then these too would be numbers and units. But then if they had approached these issues, they would have seen what the cause is in the case of substances too; for the cause is the same or analogous.

In fact, this deviation is also what causes them—when they were inquiring about the opposite of being and one (from which, together with these, the beings are

634. B7 DK.
635. Plato, *Sophist* 237a, 240d.
636. *APr.* 49b33–37, *APo.* 76b39–77a3.

composed)—to posit the relative or the unequal, which is neither the contrary nor the contradictory of these, but one nature of the beings, just like the what[-it-is] and quality.

They should have also inquired about this, how relatives are many and not one. But as things stand, they inquire how there can be many units beyond the primary one, but do not proceed to inquire how there can be many unequals beyond the unequal. And yet they make use of them and speak of great and small, many and few (from which the numbers are composed), long and short (from which the line is composed), broad and narrow (from which the plane is composed), and deep and shallow (from which the solids are composed), and they mention yet more forms of the relative. What is the cause, then, of these being many?

It is necessary, then, as we say, to assume for each thing what it is potentially. But the thinker who stated the previous things went on to declare what it is that is potentially a this and a substance but is not a being intrinsically, namely, that it is the relative (just as if he had said the qualitative), which is not potentially one or being, nor the negation of one or of being, but instead one of the beings. And so it was much more necessary, as was said, if he was inquiring how the beings are many, not to inquire about those in the same category—how there are many substances or many qualities—but how the beings are many; for some of them are substances, some qualities, and some relatives.

In the case of the other categories there is something else to give us pause about how there can be many. For because they are not separable it is by their underlying subject's coming to be many and being many that both qualities and quantities are many. And yet there must, surely, be a matter for each kind, except it cannot be separable from substances.

In the case of this somethings, however, [matter] is a reason why the this something can be many—unless there is a thing that is both a this something and a nature such as this.[637] The puzzle here is rather the following: how there can be many active substances and not one.

But again if the this and quantity are not the same, it is not said how and why the beings are many, but rather how quantities are many. For all number signifies a quantity of some sort, and so does the unit, unless it signifies a measure or the quantitatively indivisible.[638] If, then, quantity and the what-it-is are distinct, it is not said what the what-it-ises are composed of or how they can be many, and if someone says they are the same, there are many inconsistencies he has to face. **1090ᵃ1**

One might also focus the investigation concerning numbers on the question of where one should get the conviction that they exist from.[639] To the thinker who posits Forms they provide some sort of cause for the beings, if indeed each number is a

637. I.e., both a particular and a universal (1086ᵃ32–34).

638. Reading καὶ τὸ κατὰ τὸ ποσὸν ἀδιαίρετον.

639. Beginning here and continuing to 1091ᵃ12 is a discussion of the notion of separately existing numbers that differs little if at all from the discussion in 13.2–3.

certain Form, and the Form is for the other things in some way or other the cause of their being (for let us grant them this assumption). But what about the one[640] who does not think in this way, because of seeing the difficulties about Forms inherent in it (so that this is not why he posits numbers), but who does posit mathematical number—where should one get the belief that this sort of number exists from, and of what use is it for the other things? For there is nothing that the thinker who claims this says that it causes (he rather says that it is a sort of intrinsic nature). Nor is it evident that it is the cause of anything; for the theorems of the arithmeticians will all apply equally well to perceptible things, as was said.[641]

14.3
The Existence of Numbers and Mathematical Objects

Those, then, who posit that the Forms exist and that they are numbers, in virtue of setting-out each thing beyond the many and taking each to be one, try at least to say in a way why number exists. Since, however, the things they say are neither necessary nor possible, one must not—because of these things, at any rate—say that number exists. But the Pythagoreans, because they saw many of the affections of numbers to belong to perceptible bodies,[642] made the beings be numbers—not separable numbers, however, but they made the beings be composed of numbers. Why so? Because the affections of the numbers are present in a musical scale and in the heaven and in many other things. Those, however, who say that mathematical number alone exists cannot, in accord with their hypothesis, say anything of this sort. Instead, it used to be said [on their behalf] that there cannot be sciences of these [perceptible things]. But we claim that there are, as we said previously.[643] And it is clear that the objects of mathematics are not separate; for if they were separate their affections would not be present in bodies. In this regard the Pythagoreans are open to no objection, but in that they make the natural bodies be composed of numbers, things with lightness and weight be composed of things that have neither lightness nor weight, they seem to be speaking of another heaven and of other bodies but not of the perceptible ones. Those who make number separable suppose it to exist and be separable on the grounds that the axioms will not be true of perceptibles, while [mathematical] statements are true and gladden the soul; and **1090b1** similarly with mathematical magnitudes. It is clear, then, that the contrary account will say the contrary, and that the puzzle just raised, as to why if numbers are in no way present in perceptibles their affections are present in perceptibles, has to be resolved by those who say these things.

640. Speusippus.
641. 1077b17–30.
642. Rejecting the addition of ἐν.
643. 13.3.

There are some people who, because the point is the limit and extremity of the line, the line of the plane, and the plane of the solid, think that there must be natures of this sort. One should, then, examine this account too, and see whether it is not exceedingly weak. For substances the extremities are not, but all these are instead limits (since even of walking, and of movement in general, there is a limit, so that it would be a this something and a certain substance; but that is absurd). But even if they are, they will all be among the perceptibles (for it was to these that the account applied). Why, then, will they be separable?

Further, if one is not very indifferent to suffering, one might press the inquiry regarding all number and the objects of mathematics, that they make no contribution to each other, the prior to the posterior (for if number did not exist, nonetheless spatial magnitudes would exist for those who maintain the existence only of the objects of mathematics, and if spatial magnitudes did not exist, soul and perceptible bodies would exist; but nature does not seem, on the basis of the appearances, to be episodic, like a bad tragedy).

As for those who posit the Forms, this criticism misses them; for they produce spatial magnitudes from matter and number, lengths from the two, planes presumably from three, and solids from the four, or from other numbers as well—which it is makes no difference. But will these magnitudes be Forms, or what way do they exist? And what do they contribute to the beings? In fact, nothing—just like the objects of mathematics, these contribute nothing. But then no theorem even applies to them either, unless one wishes to change the objects of mathematics and produce some special notion of one's own. It is not difficult to assume any hypotheses whatever and go on at great length stringing things together. These thinkers, then, are in error in striving to unite the objects of mathematics with the Forms in this way.

And neither of those who first posited two sorts of numbers, Form number and mathematical number, have said nor can say in what way mathematical number exists or what it is composed of. For they make it an intermediate between Form number and perceptible number. For if it is composed of the great and the small, it will be the same as the other—the Form—number, and from what other small and great does he[644] produce magnitudes? If he names some other one, the elements he **1091^{a}1** names will be many. Also, if the starting-point of each of them is a one, the one will be something common to these, and one must inquire how the one can be this many things, while at the same time number cannot, according to him, be generated except from the one and an indefinite dyad.

All this, then, is absurd, and conflicts both with itself and with what is reasonable, and one seems to see in it the "long story" of Simonides;[645] for a long story, like the [excuse] of slaves, comes about when people have nothing sound to say. And the

644. Plato.

645. Probably Simonides of Ceos; what his "long story" was is unclear.

very elements—the great and the small—seem to object loudly to being dragged in;
10 for they cannot in any way generate number except what is got from [the] one by two-making.

It is absurd too to posit a coming to be of things that are eternal—or, rather, it is one of the things that are impossible. There should be no doubt about whether the Pythagoreans do or do not posit their coming to be; for they say plainly that
15 when the one had been composed, whether of planes, of surface, of seed, or of something they are at a loss to describe, immediately the closest part of the unlimited began to be constrained and limited by the limit. But since they are engaged in world-making and wish to speak like natural scientists, it is fair to examine them somewhat on what they say about nature, but to leave them out of the
20 present methodical inquiry; for we are examining the starting-points that are in the immovable things, so that it is numbers of this sort whose coming to be must be investigated.

14.4
The Relation of Mathematical Elements and Starting-Points to the Good and the Noble

They[646] say that there is no coming to be of the odd, clearly implying that there is coming to be of the even. As for the even, some present it as the first thing to come
25 from unequals—the great and the small—when these are equalized. The inequality, then, must belong to them prior to their having been equalized. And if they had always been equalized, they would not have been unequal prior to that (for there is nothing prior to what has always been). So it is evident that they are not positing the coming to be of the numbers [merely] for the sake of getting a theoretical grasp on them.

It is a puzzle, however, and a reproach to being in a puzzle-free condition, as to
30 how the elements and the starting-points are related to the good and the noble. The puzzle is whether any of the elements is the sort of thing we mean by the good-itself and the best good, or whether this is not so, but these are later in their coming to be than the elements.

The theologians seem to agree with some thinkers of the present day[647] who say
35 no—rather, it is only when the nature of the beings has progressed that both the good and the noble make their appearance. (They do this to avoid a real difficulty that confronts those who say, as some do, that the one is a starting-point. The diffi-
1091b1 culty arises, however, not because they ascribe the good to their starting-point as an affection, but because they make the one a starting-point—and a starting-point in

646. Platonists.
647. E.g., Speusippus.

the sense of an element—and generate number from the one.) The early poets agree with this same view, insofar as they say that it was not the first [gods] that reigned and ruled (for example, Night and Heaven or Chaos or Ocean), but Zeus. But then they were led to say these things because they think of the rulers of the beings as changing. Although those among them whose views are a mixture, in that not everything is stated in a mythological way (for example, Pherecydes, as well as some others), posit the primary generator as the best good, as do the Magi and some of the later wise men, such as both Empedocles and Anaxagoras, the former making love an element and the other making [divine] understanding a starting-point. Among those, though, who assert the existence of the immovable substances, some say that the one-itself is the good-itself, but they thought its substance to be most of all its oneness.

This, then, is the puzzle: Which of the two ways should one speak? But it would be absurd if to what is primary, eternal, and most self-sufficient, this very thing—self-sufficiency and preservation—belongs primarily in some other way than as a good. But then it is not because of anything other than its good state that it is incapable of passing away or self-sufficient. So to say that the starting-point is like this is quite probably true. But for it to be the one or, if not that, an element, at any rate, and an element of numbers, is impossible. For great difficulties result (to avoid which some[648] have renounced the view, namely, those who agree that the one is a primary starting-point and element, but only of mathematical number); for each unit becomes precisely what is a sort of good, and there is a great abundance of goods. Further, if the Forms are numbers, each of the Forms will be precisely what is a sort of good. But let someone posit Forms of anything he wishes; for if these are Forms only of goods, the Forms will not be substances, while if the Forms are also of substances, all animals, plants, and all the participants in a Form will be good.

These absurdities follow, then, and it also follows that the contrary element, whether plurality or the unequal, that is, the great and small, is the bad-itself (which is why one thinker[649] avoided attaching the good to the one, because it would necessarily follow, since coming to be is from contraries, that the bad would be the nature of plurality, while others say that inequality is the nature of the bad). It follows, then, that all the beings participate in the bad except one, the one-itself, and that numbers participate in it in a more undiluted way than spatial magnitudes, and that the bad is the place of the good,[650] and that it participates in and desires what is destructive of it; for contrary is destructive of contrary. And if, as we were saying, the matter is what is potentially a given thing (for example, the matter of what is actively fire is what is potentially fire), the bad will itself be the potentially good.

All this follows, then, partly because they make every starting-point an element, partly because they make contraries be starting-points, partly because they make the

648. E.g., Speusippus.

649. Speusippus. Cf. *NE* 1096ᵇ5–7.

650. I.e., the good, which is the object of desire and wish, has its place taken by the bad, which the good now desires to realize or resemble.

one a starting-point, partly because they make the numbers the primary substances, and make them separable and Forms.

14.5
How the Beings Come from Numbers and Other Related Puzzles

If, then, it is equally impossible not to put the good among the starting-points and to put it there in this way, it is clear that the account of the starting-points and of the primary substances has not been correctly given. Nor is someone[651] correct in his supposition when he compares the starting-points of the whole to that of animals and plants, on the grounds that the more complete always comes from the indefinite and incomplete, and is led by this to say that this also holds of the primary starting-points, so that the one-itself is not even a being. For even here the starting-points from which these things come are complete; for it is a human that begets a human, and the seed is not primary.

And it is absurd to generate place at the same time as the mathematical solids (for place is special to particular things, which is why they are separable by place, while the objects of mathematics are not anywhere). It is also absurd to say that the mathematical solids must be somewhere, but not to say what this place is.

People who say that beings come from elements and that the primary beings are the numbers should have said in which way number comes from the starting-points as follows, by distinguishing the ways in which one thing comes from another. Is it by mixture? But not everything is mixable; what is produced is something distinct; and the one will not remain separate and a distinct nature,[652] which they wish it to be. By mode of composition, like a syllable? But then the elements must have position, and the person who understands the one and the plurality will understand them separately. This, then, is what number will be—unit plus plurality, or the one and the unequal.

Also, since coming from certain things means in one way that they are still present as components, and in another way that they are not, which way holds of numbers? For the case in which they are present as components is possible only for things that come to be. Is it, then, in the way that things come from seed? But nothing can come away from what is indivisible. From a contrary that does not persist? But everything that comes to be in this way also comes to be from something else that does persist. Therefore, since one thinker[653] posits the one as contrary to the plurality, and another **1092b1** (treating the one as equal) as contrary to the unequal, number must be supposed to come from contraries. There is, then, something else that persists, from which, together with the other of the two factors, number is or has been generated.

651. Speusippus.
652. *GC* 327b22–26.
653. Speusippus.

Further, why precisely do other things that come from contraries, or that have contraries, pass away (even when they come from all of it), while number does not? For nothing is said about this. And yet whether present as a component or not present as a component a contrary always destroys [its contrary], just as strife destroys mixture (and yet it should not have; for that is not its contrary).

But nothing has been determined at all about the way in which the numbers are the causes of substances and of being. Is it as boundaries (as points are of spatial magnitudes) and as Eurytus assigned a certain number to belong to a certain thing (for example, one to human and another to horse), by using pebbles to copy the shape of living things, as some people put numbers in the shapes of a triangle or a square? Or is it because concord is a ratio of numbers, and so is human and each of the others? But the affections—the white and sweet and the hot—how are they numbers? And that the numbers are neither a thing's substance nor causes of its shape [or form] is clear; for the ratio is the substance, while the number is the matter[654]—for example, the substance of flesh or bone is number in this way, three parts of fire and two of earth.[655] And a number, whatever number it is, is always a number of something, of fire or earth or units. The substance, by contrast, consists in their being so-and-so much of one thing to so-an-so much of another in the mixture. And this is no longer a number but a ratio of a mixture's numbers, whether corporeal or of some other sort.

Number, then, is not a cause by producing things (whether number in general or number composed of abstract units), nor matter, nor a ratio and form of things. But then it is not the cause as the for-the-sake-of-which either.

14.6
More on Numbers and the Good: Ratios

One might, though, raise a puzzle about what the good is that things get from the numbers by the fact that their mixture is based on a number, whether easily calculable or odd.[656] For as things stand honey-water is no more healthy if it is mixed in the proportion of three times three; on the contrary, it would be more beneficial if it were mixed in no particular ratio, but were watery, than if it were based on a number, but were badly mixed.

Further, the ratios of mixtures are based on the adding of numbers, not merely on numbers—for example, it is three parts to two, not three times two. For in multiplications the factors must be of the same kind, so that the product of $1 \times 2 \times 3$ must be measurable by 1, and $4 \times 5 \times 6$ by 4; so all [products of the same factor] must be measurable by that factor. The number of fire, then, cannot be $2 \times 5 \times 3 \times 6$ and that of water 2×3.

654. Reading ὕλη.
655. Reading ἀριθμὸς ἡ οὐσία οὕτω.
656. *Sens.* 439^{b}25–30.

1093a1 If all things must share in number, though, it must follow that many things are the same, and that the same number must belong to one thing and also to another. Is the number the cause, then, and is this why the thing exists, or is this unclear? For example, there is a number proper to the spatial movements of the sun, as again to those of the moon, as well as to the life expectancy and prime, indeed, of each of the animals. What, then, is to prevent some of these numbers from being squares, some others cubes, and some equal, others double? In fact, there is nothing to prevent it. Instead, all things must turn and change within these limits, if all things share in number. And it was also possible for different things to fall under the same number, so that if things happened to have the same number, they would be the same as each other, because of having the same form of number—for example, the sun and the moon would be the same.

But why are these numbers causes? There are seven vowels, the harmonic scale consists of seven strings, the Pleiades are seven, at seven animals lose their teeth (some do, at least, some do not), and there were seven heroes against Thebes. Is it then because of the nature of such a number that the heroes were seven or that the Pleiad consists of seven stars? Surely, the heroes were seven because there were seven gates or due to some other cause, and while we count the Pleiad as seven and the Bear as twelve, others count more stars in them.

They even say that the letters *xi*, *psi*, and *zeta* are concords, and that there are three of these [double consonants] because there are three concords. They do not care at all that there might be a thousand such letters, since, for example, one symbol might be assigned to *gamma* and *rho* together. But if they reply that each of these three is equal to two of the other letters, while none of the others is, and the cause of this is that there are three regions of the mouth[657] and one letter is applied to *sigma* in each, it is because of this that there are only three, not because there are three concords, since there are in fact more than three, but there cannot be more than three double consonants.

These people, then, are like the early Homeric scholars, who see small resemblances but overlook large ones.

Some further say that there are many such cases—for example, that the middle strings are nine and eight,[658] that the epic verse has seventeen syllables, which is equal in number to these strings, and that the line scans in the right [or first] half with **1093b1** nine syllables, and in the left [or second] with eight. And they say that the distance in letters from *alpha* to *omega* is equal to that from the lowest note of the pipe to the highest, and that its number is that of the whole system of the heaven.[659] It must

657. The three regions are the palate, the lips, and the teeth, against which the tongue is placed in pronouncing *xi*, *psi*, and *zeta*, pronounced S/DA.

658. The middle strings are the fourth and fifth, which are represented by the ratios 9:6 and 8:6.

659. Perhaps because there are twelve signs of the zodiac, eight heavenly spheres (that of the fixed stars and those of Saturn, Jupiter, Mars, Venus, Mercury, sun, moon) and four elements, and 12 + 8 + 4 = 24, which is the number of letters in the Greek alphabet.

be observed, however, that no one should be at a loss to state or to discover such resemblances in eternal things, since they can be found even in things that pass away.

But the celebrated natures of the numbers and their contraries, and those in mathematics generally, as some people describe them and make them causes of nature seem to vanish, when they are investigated in this way, at any rate; for none of them is a cause in any of the ways that were distinguished with respect to the starting-points. In a way, however, they make it evident that the good does belong here, and that the odd, the straight, the square, the powers of certain numbers, are in the column of the noble; for the seasons and a certain sort of number go together, and all the other examples that they collect together on the basis of mathematical speculations have this force. That is why they seem like chance occurrences; for they are indeed coincidences (although they all properly belong with each other), but are one by analogy; for in each category of being there is something analogous—as the straight is in length, so in surface is the level, and perhaps, in number the odd, and in color the white.

Further, it is not the Form numbers that are the causes of harmonic relations and the like (for equal Form numbers differ from each other in form; for even their units do), so that one does not have to posit Forms because of this, at any rate.

These, then, are the consequences [of the theory], and yet more might be adduced. And the fact that these thinkers have such a hard time with the generation of the numbers and are incapable of stringing things together in any way at all seems to be a sure sign that the objects of mathematics are not separable from perceptibles, as some say, and that the starting-points are not these.

NICOMACHEAN ETHICS*

BOOK 1

1.1
Goods and Ends

Every craft and every methodical inquiry and likewise every action and deliberate choice seem to aim at some good. That is why they correctly declare that the good is what all aim at. **1094a1**

A certain difference, however, appears to exist among ends; for while some are activities, others are works of some sort beyond the activities themselves. But wherever there are ends beyond the actions, in those cases, the works are naturally better than the activities. And since there are many sorts of actions and of crafts and sciences, their ends are many as well; for health is the end of medicine, a ship of shipbuilding, victory of generalship, and wealth of household management. 5

But since some of these fall under some one capacity, as bridle making falls under horsemanship, along with all the others that produce equipment for horsemanship, and as it and every action in warfare fall under generalship, in the same way, others fall under different ones—in all such cases, the ends of the architectonic ones are more choiceworthy than the ends under them; for these are pursued for the sake also of the former. It makes no difference whether the ends of the actions are the activities themselves or some other thing beyond them, just as in the sciences we have mentioned. 10 15

1.2
Ethics Is a Sort of Politics

If, then, there is some end of things doable in action that we wish for because of itself, and the others because of it, and we do not choose everything because of something else (for if that is the case, it will go on without limit, so that the desire will be empty and pointless), it is clear that this would be the good—that is, the best good. Therefore, regarding our life as well, will knowing the good have great influence and—like archers with a target—would we be better able to hit what one should? If so, one 20

* Translated by C. D. C. Reeve. Text: I. Bywater, *Ethica Nicomachea* (Oxford, 1894).

must try to grasp in outline, at least, what precisely the good is and to which of the sciences or capacities it properly belongs.

It would seem to be the one with the most control, and the most architectonic one. And politics appears to be such; for it is the one that prescribes which of the sciences need to exist in cities and which ones each group in cities must learn and up to what point. And we see that even the capacities that are most honored are under it—for example, generalship, household management, and rhetoric. And since it uses the other practical sciences,[1] and further, legislates about what must be done and what avoided, its end would encompass those of the others, so that it would be the human good.

For even if the good is the same for an individual and for a city, that of a city is manifestly a greater and, at any rate, a more complete good to acquire and preserve; for while it must content us to acquire and preserve this for an individual alone, it is nobler and more divine to do so for nations and cities. Our methodical inquiry, then, aims at the good of these things—for it is a sort of politics.

1.3
Exactness in Ethics

Our account would be adequate if its degree of perspicuousness were in accord with its subject matter; for we must not seek the same degree of exactness in all accounts, any more than in all products of the crafts.

Noble things and just things, which are what politics investigates, admit of so much difference and variability that they seem to exist by conventional law alone and not by nature. Good things seem to admit of variability in the same way too, because they result in harm to many people; for some have in fact been destroyed because of wealth, others because of courage. It must content us, then, in an account that concerns and is in accord with such things, to prove the truth roughly and in outline, and—in an account that concerns things that hold for the most part and is in accord with them—to reach conclusions of the same sort too. It is in the same way, then, that we must also take each of the things we say; for it is characteristic of a well-educated person to look for the degree of exactness in each kind of investigation that the nature of the subject itself allows; for it is evident that accepting persuasive arguments from a mathematician is much the same as demanding demonstrations from a rhetorician.

But each person correctly judges the things he knows and is a good judge of these. Therefore, a person well educated in a given area is a good judge in that area, while a person well educated in all areas is an unconditionally good judge. That is why a young person is not a proper listener for politics; for he has no experience

1. Reading πρακτικαῖς.

of the actions of life, and the accounts are in accord with these and concerned with these.

Further, since he tends to follow his feelings, it will be pointless and not beneficial for him to listen, since the end is not knowledge but action. And it makes no difference whether he is young in years or youthful in character; for the deficiency is not a matter of time but is due to living and pursuing each thing in accord with feelings. For to people like that, knowledge turns out to be profitless in just the way it does to those who lack self-control. To those who form their desires and do their actions in accord with reason, however, it would be of great benefit to know about these things.

So much for the prefatory remarks concerning the listener, how our discussion is to be received, and what we are proposing to do.

1.4
Views about Happiness

Let us, then, resume our account. Since every sort of knowledge and every deliberate choice reaches after some good, let us say what it is that politics aims at—that is, what the topmost of all the good things doable in action is.

About its name, most people are pretty much agreed; for both ordinary people and sophisticated ones say it is happiness and suppose that living well and doing well are the same as being happy. Concerning happiness, however, and what it is, they are in dispute, and ordinary people do not give the same answer as wise ones. For ordinary people think it is one of the plainly evident things, such as pleasure or wealth or honor—some taking it to be one thing, others another. And often even the same person thinks it is different things; for when he gets a disease, it is health, while when he is poor, it is wealth. But when these people are conscious of their own ignorance they are wonder-struck by those who proclaim some great thing that is over their heads. And some people used to think that, beyond these many good things, there is another intrinsically good one that causes all of them to be good.

It is presumably quite pointless to inquire into all these beliefs, and enough to inquire into those that are most prevalent or that seem to have some argument for them.

We must not let it escape our notice, however, that arguments leading from starting-points and arguments leading to starting-points are different. For Plato too was rightly puzzled about this and used to inquire whether the route was leading from starting-points or to starting-points—as, in a stadium racecourse, that of the athletes may lead away from the starting-point toward the boundary or in the reverse direction. For we must start from things that are known. But things are known in two **$1095^{b}1$** ways; for some are known to us, some unconditionally. Presumably, then, one must start from things known to us.

That is why one must be nobly brought up if, where noble things, just things, and the subject matter of politics as a whole are concerned, one is to be an adequate listener. For the starting-point is the that and, if this is sufficiently evident, we do not also need the why. A person who is nobly brought up, then, either has the starting-points or can easily get hold of them. And as for the one who neither has nor can get hold of them, he must listen to Hesiod:

> Best of all is the one who understands everything himself,
> Good too is that person who is persuaded by one that has spoken well.
> But he who neither understands it himself nor by listening to another
> Takes it to heart, that one is a useless man.[2]

1.5
Three Sorts of Lives

But let us take up our account at the point where we digressed.[3] For people seem (which is not unreasonable) to get their suppositions about the good—that is, happiness—from their lives. Ordinary people, indeed, the most unrefined ones, suppose it to be pleasure. And that is why the life they like is the life of indulgence. For there are three lives that stand out: the one we just mentioned, the political, and, third, the contemplative.

Ordinary people seem wholly slavish, because the life they deliberately choose is one that is characteristic of grazing cattle. But they get a hearing for their choice because many of those in positions of authority feel the same as Sardanapalus.

Sophisticated people, on the other hand, and doers of action, deliberately choose honor; for it is pretty much the end of the political life. But it is apparently more superficial than what we are seeking; for it seems to be in the hands of the honorers more than of the honorees, while we divine that the good is something that properly belongs to us and is difficult to take away. Further, people seem to pursue honor in order to be convinced that they are good—at any rate, they seek to be honored by practically wise people, among people who know them, and for virtue. It is clear, then, that according to them, at least, virtue is better.

Maybe one might even suppose that it is more the end of the political life than honor is. But even virtue is apparently too incomplete [as an end]; for it seems possible to have virtue even while sleeping or being inactive throughout life or while suffering evils and bad luck of the worst sort. Someone who was living like that, **1096ᵃ1** however, no one would call "happy" unless he was defending a thesis at all costs. That is enough about these issues, since they have also been adequately discussed in the studies that are in circulation.

2. Hesiod, *Works and Days* 293, 295–297.
3. 1095ᵃ22.

The third life is the contemplative one, which we will undertake to investigate in what follows.

The life of a moneymaker is in a way forced, and it is clear that wealth is not the good we are seeking; for wealth is useful and for the sake of something else. Hence we might be more inclined to suppose that the things already mentioned are the end, since they are liked because of themselves. But they are apparently not the end either—indeed, many arguments have been presented against them. We may, then, set them aside.

1.6
Plato on the Good

But perhaps we had better investigate the universal good and go through the puzzles concerning the way in which it is said of things, even if this sort of inquiry is an uphill one because the men who introduced the Forms were friends of ours.[4] But perhaps it would seem better, even necessary, at any rate, when the preservation of the truth is at stake, to do away even with what is properly our own, especially so as we are philosophers; for while we love both our friends and the truth, the pious thing is to honor the truth first.

Those, then, who introduced this view did not posit Forms for things among which they spoke of prior and posterior, which is why they did not furnish a Form of the numbers. But good is said of things in the categories of what-it-is, quality, and relative, and what is intrinsically—that is, substance—is naturally prior to relative (for it would seem to be an offshoot or coincidental affection of what is), so that there would not be some common Form set over these.

Further, good is said of things in as many ways as being. For it is said of things in the category of what-it-is (for example, the god and the understanding), in that of quality (the virtues), in that of quantity (the moderate amount), in that of the relative (the useful), in that of time (the opportune moment), in that of place (a livable dwelling), and so on. Therefore, it is clear that it would not be some common universal—that is, a one; for then it would not be said of things in all the categories but only in one.

Further, if of things that are in accord with one Form there is also one science, then of all goods there would also be some one science. But as things stand there are many, even of goods in one category—for example, of the opportune moment (for in war it is generalship but in disease medicine) and of the moderate amount (in nourishment it is medicine, while in physical exertion it is physical training).

4. Plato and some of his followers.

One might also raise a puzzle about what they even mean by "each-thing-itself,"[5] if indeed of both human-itself and human there is a single account—that of human. For insofar as each is human, they will not differ at all, and, if this is the case, neither will they differ, insofar as each is good.

Neither will the good-itself be more good by being eternal, if indeed a long-lasting white thing is no whiter than an ephemeral one.

The Pythagoreans seem to have something more convincing to say about this, since they place the one in the column of goods—and, indeed, Speusippus seems to have followed their lead.

But let us leave these issues for another discussion.

A controversial point, however, does lie concealed in what we have said, because their arguments are not concerned with every good. The things said in accord with one Form are those pursued and liked as intrinsic goods, while those that tend to produce or safeguard these, or to prevent their contraries, are said to be good because of these and in a different way. It is clear, then, that good would be said of things in two ways, that is, of some as intrinsic goods, of others as goods because of these. Let us separate off, then, the intrinsic goods from the ones that produce a benefit, and investigate whether intrinsic goods are said to be good in accord with a single Form.

The intrinsic ones, though, what sorts of things should one suppose them to be? Or aren't they the ones that are pursued on their own as well—for example, being wise, seeing, and certain pleasures and honors? For even if we do pursue these because of other things, we might nonetheless suppose them to belong among the intrinsic goods. Or does nothing else belong there except the Form? In that case, the Form will be pointless. But if these other things belong among the intrinsic ones too, the same account of the good will have to show up in all of them, just as that of whiteness does in snow and white lead. But in fact the accounts of honor, wisdom, and pleasure differ and are at variance regarding the very way in which they are goods. Therefore, the good is not something common and in accord with a single Form.

But how, then, is it said of things? For at least it does not seem to be a case of homonymy resulting from luck. Is it, then, that all goods at least derive from or are related to a single thing? Or is it more a matter of analogy? For as sight is in the case of body, so understanding is in the case of soul, and so on for other things in other cases.

But perhaps we must leave these questions aside for now, since an exact treatment of them more properly belongs to a different branch of philosophy.[6] It is the same way in the case of the Form; for even if there is some single good predicated in common of all intrinsic goods, a separable one that is itself an intrinsic good, it is clear that it would not be doable in action or acquirable by a human being. But that is the sort that is being sought now.

5. *Met*. 1040b32–34.

6. I.e., dialectic. See *EE* 1217b16–19.

Maybe someone might think it better to get to know the Form in connection with the goods that are acquirable and doable in action; for they might think that by having it as a paradigm, we will also better know those things that are good for us and—knowing them—aim at and hit them. This argument certainly has some plausibility, but it seems to clash with the sciences; for each of these, though it seeks some good and looks for how to supply whatever is lacking, leaves aside knowledge of the Form. And yet for all craftsmen not to know—and not even to look for—so important an aid would hardly be reasonable.

There is a puzzle too about how a weaver or a carpenter will benefit, as regards his own craft, from knowing the good-itself or how anyone will be a better doctor or a better general from having seen the Form-itself. For the doctor appears not even to investigate health in this way, but rather that of the human being, and perhaps even more the health of this one; for he treats a particular one.

So much, then, for these issues.

1.7
Completeness, Self-Sufficiency, and Human Work

Let us return to the good we are seeking and what exactly it could be. For it is apparently different in different actions and different crafts; for it is one thing in medicine, a different one in generalship, and likewise for the rest. What, then, is the good characteristic of each? Or isn't it the thing for whose sake the rest of the actions are done? In medicine this is health, in generalship victory, in building a house, and in other crafts something else, and in every action and deliberate choice it is the end; for it is for the sake of the end that everyone does the rest. So if there is some end of all the things doable in action, this would be the good doable in action; and if more than one, it would be these.

Taking a different course, then, our account has reached the same conclusion.[7] But we must try to make this yet more perspicuous.

Since there are manifestly many ends, and we choose some of them because of something else, as we do wealth, pipes, and instruments generally, it is evident that not all ends are complete. But the best one is apparently something complete. So if one thing alone is complete, this would be what we are seeking, but if more are, the most complete of these.

We say that what is intrinsically worth pursuing is more complete than what is worth pursuing because of something else, and that what is never choiceworthy because of something else is more complete than what is both intrinsically choiceworthy and choiceworthy because of this one, and, accordingly, that what

7. $1094^{a}21$–22, $1094^{b}6$–7, $1095^{a}16$–17.

is unconditionally complete is what is always intrinsically choiceworthy and never choiceworthy because of something else.

Happiness seems to be most like this; for it we always choose because of itself
1097b1 and never because of something else. But honor, pleasure, understanding, and every virtue, though we do choose them because of themselves as well (for if they had no further consequences, we would still take each of them), we also choose for the sake of happiness, supposing that through them we will be happy. Happiness, on the
5 other hand, no one chooses for the sake of these things or because of anything else in general.

The same conclusion also apparently follows from self-sufficiency; for the complete good seems to be self-sufficient. By "self-sufficient," however, we mean not self-sufficient for someone who is alone, living a solitary life, but also for parents,
10 children, wife, and friends and fellow citizens generally, since a human being is by nature political. Of these, some defining mark must be found; for if we extend the list to ancestors and descendants and to friends' friends, it will go on without limit. But we must investigate this on another occasion. In any case, we posit that the self-sufficient is what, on its own, makes a life choiceworthy and lacking in nothing,
15 and this, we think, is what happiness is like.

Further, we think it is the most choiceworthy of all things, when not counted among them. But if it is counted among them, it clearly would be more choiceworthy with the addition of the least of goods; for what is added would bring about a superabundance of goods, and, of goods, the greater one is always more choiceworthy.

20 Happiness, then, is apparently something complete and self-sufficient, being the end of what is doable in action.

But perhaps to say that happiness is the best good appears to be something [generally] acknowledged, and a clearer statement of what it is is still required. Maybe, then, this would come about if the work of the human being were
25 grasped. For just as for a pipe player, a sculptor, every craftsman, and in general for whatever has some work and action, the good—the doing well—seems to lie in the work, the same also seems to hold of a human being, if indeed there is some work that is his.

Are there, then, some works and actions of a carpenter and of a shoemaker but
30 none at all of a human being? And is he by nature idle? Or, rather, just as of eye, hand, foot, and of each part generally there seems to be some work, may we likewise also posit some work of a human being that is beyond all these?

What, then, could this be? For living is manifestly shared with plants as well, but we are seeking what is special. Therefore, we must set aside the living that consists in
1098a1 nutrition and growth. Next in order is some sort of perceptual living. But this too is manifestly shared with the horse, the cow, and every animal.

There remains, then, some sort of practical living of the part that has reason. And of what has reason, one part has it due to obeying reason, the other due to having

it and exercising thought. But living is said of things in two ways, and we must take the one in accord with activity; for this seems to be called "living" in a fuller sense.

If, then, the work of a human being is activity of the soul in accord with reason or not without reason, and the work of a sort of thing, we say, is the same in kind as the work of an excellent thing of that sort (as in the case of a lyre player and an excellent lyre player), and this is unconditionally so in all cases, when we add to the work the superiority that is in accord with the virtue (for it is characteristic of a lyre player to play the lyre and of an excellent one to do it well)—if all this is so, and a human being's work is supposed to be a sort of living, and this living is supposed to be activity of the soul and actions that involve reason, and it is characteristic of an excellent man to do these well and nobly, and each is completed well when it is in accord with the virtue that properly belongs to it—if all this is so, the human good turns out to be activity of the soul in accord with virtue and, if there are more virtues than one, then in accord with the best and most complete.[8] Further, in a complete life. For one swallow does not make a spring, nor does one day, nor, similarly, does one day or a short time make someone blessed and happy.

Let the good, then, be sketched in this way; for perhaps one should outline first and fill in the details later. But it would seem that anyone can develop and articulate the things in the outline that have been correctly done, and that time is a good discoverer and co-worker in such matters. This is even the source of advances in the crafts; for anyone can produce what is missing.

We must also remember what was said previously and not seek exactness in everything alike but in each case one that is in accord with the subject matter and to the degree sought by the methodical inquiry that properly belongs to it. For in fact a carpenter and a geometer inquire differently about the right angle. A carpenter does so to the degree that is useful for his work, while a geometer inquires about what it is or what sort of thing; for he is a contemplator of the truth. We must do things in just the same way, then, in other cases, so that side issues do not overwhelm the works themselves.

Neither must we demand the cause in all cases alike. Rather, in some cases it will be adequate if the fact that they are so has been correctly proved—as it is indeed where starting-points are concerned. And the that is a first thing and a starting-point. **1098^{b}1**

We get a theoretical grasp on some starting-points through induction, some through perception, some through some sort of habituation, and others through other means. In each case one must try to pursue each sort in the way appropriate to its nature and make very serious efforts to define them correctly; for they are of great and decisive importance regarding what follows. It seems indeed that the starting-point is more than half the whole, and that many of the things we were inquiring about will become evident through it.

8. F90 42.15.

1.8
The Argument Defended

We must investigate happiness, however, not only in accord with the conclusions and premises of our argument but also in accord with the things we say about it; for all the facts are in tune with a true view, while the truth soon clashes with a false one.

Goods, then, have been divided into three sorts, with some said to be external, some relating to the soul, and some to the body. The goods relating to soul are most fully such, and, we say, are goods to the highest degree, and we take the actions and activities of the soul to be goods relating to soul. So what we have said is correct, according to this view at least, which is of long standing and agreed to by philosophers.[9]

It is correct even in saying that actions and activities of some sort are the end; for that way the end turns out to be one of the goods relating to soul, and not one of the external ones.

The saying that the one who is happy both lives well and does well is also in tune with our argument; for happiness has been pretty much defined as a sort of living well and doing well.

Again, all the things that are looked for where happiness is concerned apparently hold of what we have said it is. For to some it seems to be virtue, to others practical wisdom, to others some sort of theoretical wisdom, while to others it seems to be these, or one of these, involving pleasure or not without pleasure. Other people include external prosperity as well. Some of these views are held by many and are of long standing, while others are held by a few reputable men. And it is not reasonable to suppose that either group is entirely wrong, but rather that they are correct on one point at least or even on most.

With those who say[10] that happiness is virtue or a certain sort of virtue, our argument is in tune; for activity in accord with virtue is characteristic of virtue. But it makes no small difference, presumably, whether we suppose the best good to consist in virtue's possession or in its use—that is, in the state or in the activity. For it is possible for the state to exist while accomplishing nothing good—for example, for
1099a1 the person who is sleeping or out of action in some other way. But the same will not hold of the activity; for he will necessarily be doing an action and doing it well. And just as in the Olympic Games it is not the noblest and strongest who get the victory crown but the competitors (for it is among these that the ones who win are found), so also among the noble and good aspects of life it is those who act correctly who win the prizes.

9. E.g., Plato, *Euthydemus* 279b–c, *Philebus* 48e, *Laws* 743e.
10. *EE* 1215a24.

Further, their life is intrinsically pleasant. For being pleased is among the things that belong to soul, and to each person the pleasant is that by reference to which he is said to be a lover of such-and-such—as, for example, a horse in the case of a lover of horses, and a play in that of a lover of plays. In the same way, just things are pleasant to a lover of justice and the things in accord with virtue as a whole are pleasant to a lover of virtue.

The things that are pleasant to ordinary people, however, are in conflict because they are not by nature pleasant, while it is the things by nature pleasant that are pleasant to lovers of what is noble. And actions in accord with virtue are like this, so that they are pleasant both to such people and intrinsically.

Their life, then, has no need of a pleasure that is superadded to it, like some sort of appendage, but has the pleasure within itself. For besides what we have already said, the person who does not enjoy doing noble actions is not good; for no one would call a person "just" who did not enjoy doing just actions, or generous if he did not enjoy doing generous ones, and similarly as regards the others.

If that is so, however, actions in accord with virtue would be intrinsically pleasant. But they are also good, of course, and noble as well. Further, they are each of these things to the highest degree, if indeed an excellent person judges them correctly—and he judges them in the way we have said.

Therefore, happiness is what is best, noblest, and most pleasant. And these are not distinguished in the way the Delian inscription says:

> The noblest thing is the most just; the best to be healthy;
> Most pleasant of all, however, is to get what one loves.[11]

For the best activities possess them all. And it is these—or the one among them that is best—that we say happiness is.

Nonetheless, it apparently needs external goods to be added, as we said;[12] for it is impossible or not easy to do noble actions without supplies; for just as we perform many actions by means of instruments, we perform many by means of friends, wealth, and political capacity. Then again, there are some whose deprivation disfigures blessedness, such as good breeding, good children, and noble looks; for we scarcely have the stamp of happiness if we are extremely ugly in appearance, ill-bred, living a solitary life, or childless, and have it even less, presumably, if our children or friends are totally bad or were good but have died.

Just as we said,[13] then, happiness does seem to need this sort of prosperity to be added. That is what leads some people to identify good luck with happiness and others to identify virtue with happiness.

11. Attributed to Theognis of Megara, lns. 225–226 Diehl.
12. 1098b26–29.
13. Most recently at 1099a32.

1.9
How Happiness Is Achieved

It is also what leads people to puzzle about whether happiness is something acquirable by learning or by habituation or by some other sort of training, or whether it comes about in accord with some divine dispensation or even by luck.

But if anything is a gift from the gods to human beings, it is reasonable to suppose that happiness is also god given—especially since it is the best of human things. But though perhaps this issue properly belongs more to a different investigation, it is evident that, even if happiness is not a godsend but comes about through virtue and some sort of learning or training, it is one of the most divine things; for virtue's prize and end is manifestly something both divine and blessed. At the same time, it would also be something widely shared; for it is possible for it to be acquired through some sort of learning or supervision by all those not disabled in relation to virtue.

If it is better to acquire it in that way than to be happy by luck, however, it is reasonable to suppose that this is how we do acquire it, if indeed what is in accord with nature is by nature in the noblest possible condition. It is the same way with what is in accord with craft or with any cause whatsoever—above all, what is in accord with the best one. To entrust what is greatest and noblest to luck would strike a very false note.

The answer we are seeking is also entirely evident from our argument; for we have said that happiness is a certain sort of activity of the soul in accord with virtue, while of the remaining goods, some are necessary conditions of it, others are by nature co-workers and useful as instruments. This also would agree with what we said at the start;[14] for we took the end of politics to be the best end. And its supervision aims above all at producing citizens of a certain sort—that is, good people and doers of noble actions.

It makes perfect sense, then, that we do not say that a cow, a horse, or any other animal whatsoever is happy; for none of them can share in this sort of activity. **1100a1** It is due to this cause that a child is not happy either; for he is not yet a doer of such actions because of his age. Children who are said to be happy are considered "blessed" because of our expectations. For, as we said,[15] happiness requires both complete virtue and a complete life. For many reversals of luck and all sorts of lucky accidents occur in life, and the most prosperous may meet with great disasters in old age—just as is said of Priam in the story of the events at Troy. And no one counts someone happy who has suffered strokes of luck like that and dies in a wretched way.

14. 1094a27–b7.
15. 1098a16–19.

1.10
When to Count a Human Being Happy

Are we then to count no other human being happy either, as long as he is still living but—in accord with Solon's advice—must see the end? And if we are indeed to accept this view, is it really the case that someone is happy only when he is dead? Or is that a completely strange notion—most of all for those who say, as we do, that happiness is a sort of activity?

Even if we do not say that a dead person is happy, however—and this is not what Solon means either, but that when a human being has died it would at that point be safe to call him "blessed" (as then being outside the reach of bad things and misfortunes)—that is also something we might dispute to some extent; for to some extent it does seem that something may prove good or bad for the one who is dead, if indeed there are also good or bad things for the one who is living but not actively perceiving them—for example, honor and dishonor, and children or descendants generally who do well or who suffer strokes of bad luck.

But this also raises a puzzle; for it is possible for many reversals of luck involving his descendants to befall the one who has lived a blessed life until old age and died accordingly. Some of his descendants may be good people and get the life they deserve while to others the contrary may happen. And it is clear that the degree of separation between them and their ancestors admits of all sorts of variation. But it would be strange, surely, if the dead person changed along with them and was happy at one time and, again, wretched at another. But it would also be strange if what happens to descendants did not affect their ancestors to any extent or for any period of time.

But we must go back to the first puzzle; for maybe from that we would also be able to get a theoretical grasp on what we are now inquiring about. Suppose that we must wait to see the end in each case and at that point call someone "blessed"—not as at that time being blessed but because he was so before. Wouldn't it be strange, then, if when he is happy, we cannot truly attribute to him what he actually possesses, because of our not wishing to call the living "happy" because of reversals of luck, and because we suppose that happiness is something stable and in no way easy **1100b1** to reverse, while luck often turns completely around in the case of the same person? For it is clear that if we were to be guided by luck, we would often have to say that the same person is happy and then wretched, turn and turn about, thereby representing the happy person as a sort of chameleon and as someone with unsound foundations.

Or is it that to be guided by luck is not at all correct? For it is not in luck that living well and living badly are to be found, but a human life needs this to be added, as we said,[16] while it is activities in accord with virtue that control happiness and the contrary ones its contrary. The puzzle we are now going through further testifies to our argument; for none of the works of human beings are as stable as the activities in

16. 1099b6–7.

accord with virtue; for they seem to be more stable even than our knowledge of the sciences. And of these activities themselves, the most estimable ones are more stable, because the blessed live most of all and most continuously in accord with them; for this would seem to be the cause of why forgetfulness does not occur about them.

What we are inquiring about, then, will be characteristic of the happy person, and throughout life he will be as we say; for he will always or more than anyone else do actions and get a theoretical grasp on things in accord with virtue, and will bear what luck brings in the noblest way and, in every case, in the most suitable way, as one who is "truly good, foursquare, beyond blame."[17]

Many things happen in accord with luck, however, that differ in greatness and smallness. But small strokes of good luck, or similarly of the opposite, clearly will not turn the scale of his life, while great and repeated ones, when good, will make his life more blessed (for by nature they even help adorn it, and his use of them is noble and excellent). If they turn out the reverse, they reduce or spoil blessedness; for they involve pain and impede many activities. Nonetheless, even in these cases nobility shines through when someone calmly bears repeated strokes of great bad luck—not because he is insensitive to suffering but because of being well-bred and great-souled.

If, however, it is activities that control living, as we said,[18] no blessed person would ever become wretched; for he would never do hateful or base actions. For a truly good and wise person, we think, bears what luck brings graciously and, making use of the resources at hand, always does the noblest actions, just as a good general makes the best uses in warfare of the army he has and a good shoemaker makes the best shoes out of the hides he has been given, and the same way with all other craftsmen.

But if this is so, a happy person would never become wretched—nor blessed certainly—if he runs up against luck like Priam's. He is not, then, variable or easily subject to reversals of luck; for he will not be easily shaken from his happiness by just any strokes of bad luck that chance to come along but only by great and repeated ones. And from these he would not return to being happy again in a short time but—if indeed he does do so—in a long and complete one in which he achieves great and noble things.

What, then, prevents us from calling "happy" the person who is active in accord with complete virtue and is adequately supplied with external goods not for some random period of time but in a complete life? Or must we add that he will continue living like that and will die accordingly, since the future is obscure to us and we suppose happiness to be an end and complete in every way? If so, we will call "blessed" those living people who have and will continue to have the things we mentioned—blessed, though, in the way human beings are.

So much for our determinations on these issues.

17. Simonides, Fr. 379 Page.
18. 1098a12–20.

1.11
Death and Happiness

The view that the luck of someone's descendants and all his loved ones has not the slightest effect on him is manifestly a view too inimical to friendship and one that is contrary to the beliefs held on the subject. But since the things that happen are many and admit of all sorts of differences, and some of them get through to us more and others less, it is manifestly a long—even endless—task to distinguish all the particular cases, and it would perhaps be enough to speak about the matter in universal terms and in outline.

If, then, of even the strokes of bad luck that affect the person himself, some have a certain weight and turn the scale as regards his life, while others seem to have a lighter one, the same also holds for what affects all his friends. And for each incident, it makes a difference whether it involves the living or the dead—much more than whether the unlawful and terrible deeds in tragedies have happened beforehand or are enacted on the stage.

Our deductive argument, then, must also take account of this difference, but even more account, perhaps, of the results of going through the puzzles about whether the dead share in any good thing or in any of the opposite ones. For it seems likely from these considerations that even if anything at all does get through to them, whether **1101b1** good or the opposite, it is something feeble and small, either unconditionally so or so for them. Or if it is not like that, it is of a size and sort, at any rate, that does not make happy those who are not happy or take away the blessedness of those who are. It does, then, contribute something to the dead, apparently, when their friends do well and similarly when they do badly, but something of such a sort and size that it neither makes the happy ones unhappy nor does anything else of this sort.

1.12
Is Happiness Praiseworthy or Estimable?

Having made these determinations, let us investigate whether happiness is included among praiseworthy things or, rather, among estimable ones; for it is clear that it is not included among capacities, at any rate.

It appears, then, that all the things that are praiseworthy are praised for being of a certain quality and for standing in a certain relation to something; for we praise the just person and the courageous one—in fact, the good person and virtue generally—because of the actions and the works involved, also the strong person and the good runner, and so on in each of the other cases, because he is naturally of a certain quality and stands in a certain relation to something good or excellent. This is also clear from awards of praise involving the gods; for these are manifestly ridiculous

if it is by reference to us that they are awarded. But this happens because awards of praise involve such a reference, as we just said.

If praise is of things like this, it is clear that of the best things there is no praise but something greater and better—as is in fact evident; for we call the gods both "blessed" and "happy" and call the most divine of men this as well. It is the same way in the case of goods too; for we never praise happiness as we praise justice, but consider it blessed, since it is a more divine and better thing.

It seems, in fact, that Eudoxus advocated in the correct way the cause of pleasure in the competition for supremacy; for not to praise pleasure, while including it among the goods, is to indicate, he thought, that it is better than things that are praised, in the way that the god and the good are; for it is to these that the others are referred.

For praise is properly given to virtue (for we are doers of noble actions due to it), while encomia are properly given to its works, in like manner both to those of the body and those of the soul. But perhaps an exact treatment of these issues more properly belongs to those who work on encomia. It is clear to us from what we have said, however, that happiness is included among things both estimable and complete.

This also seems to hold because happiness is a starting-point; for it is for the sake of it that we all do all the other actions that we do, and we suppose that the starting-point and cause of goods is something estimable and divine.

1.13
The Soul and Its Virtues

Since happiness is some activity of the soul in accord with complete virtue, we must investigate virtue; for maybe that way we would also get a better theoretical grasp on happiness. It seems too that the one who is truly a politician has worked most on virtue; for he wishes to make the citizens good and obedient to the laws. A paradigm case is provided by the Cretan and Spartan legislators and by any others there may have been that are like them. If this investigation belongs to politics, however, it is clear that our present inquiry would be in accord with the deliberate choice we made at the start. But it is clear that the virtue we must investigate is human virtue; for it is in fact the human good we were seeking, and human happiness.

By "human virtue," though, we mean not that of the body but that of the soul. And happiness, we say, is an activity of the soul. But if all this is so, it is clear that a politician must in a way know about what pertains to the soul, just as the one who is going to take care of people's eyes must know about the body generally—more so, indeed, to the extent that politics is more estimable and better than medicine—and that doctors (the ones who are more sophisticated) occupy themselves greatly with knowing about the body. It is also for a politician, then, to get a theoretical grasp on what concerns the soul. But his theoretical grasp must be for the sake of the things in

question and of an extent that is adequate to the things being looked for; for a more exact treatment is perhaps harder work than the issues before us require.

Enough has been said about some aspects of the soul in the external accounts too, and we must make use of these—for example, that one part of the soul is non-rational, while another part has reason. Whether these are distinguished like the parts of the body or like anything else that is divisible or whether they are two in account but inseparable by nature (like convex and concave in a curved surface) makes no difference for present purposes.

Of the non-rational part, one part seems to be shared and vegetative—I mean, the cause of nutrition and growth; for this sort of capacity of soul is one that we suppose is present in all things that take in nourishment, even embryos, and that this same one is also present in completely grown animals; for that is more reasonable than to **1102[b]1** suppose a different one to be present in them.

The virtue of this capacity, then, is apparently something shared and not [distinctively] human; for this part and this capacity seem to be most active in sleep, and a good person and a bad one are least clearly distinguished during sleep (leading people to say that the happy are no different from the wretched for half their lives; and this makes perfect sense; for sleep is idleness of the soul in that respect with reference to which it is said to be excellent or base), unless—to some small extent—some movements do get through to us and, in this way, the things that appear in the dreams of decent people are better than those of any random person. But that is enough about these things, and we must leave the nutritive part aside, seeing that by nature it has no share in human virtue.

Another natural constituent of the soul, however, also seems to be non-rational, although it shares in reason in a way. For we praise the reason—that is, the part of the soul that has reason—of a person with self-control and of a person without it; for it exhorts them correctly toward what is best. But they also have by nature something else within them besides reason, apparently, which fights against reason and resists it. For just as with paralyzed limbs (when their owners deliberately choose to move them to the right, they do the contrary and move off to the left), so it is in the case of the soul as well; for the impulses of people who lack self-control are in contrary directions. In the case of the body, to be sure, we see the part that is moving in the wrong direction, while in the case of the soul we do not see it. But presumably we must nonetheless acknowledge that in the soul as well there is something besides reason, countering it and going against it. How it is different is not important.

But this part apparently also has a share of reason, as we said;[19] at any rate, this part of the self-controlled person is obedient to reason. Further, that of the temperate and courageous person, presumably, listens still better; for there it chimes with reason in everything.

19. $1102^{b}13–14$.

Apparently, then, the non-rational part is also twofold. For the vegetative part does not share in reason in any way but the appetitive part (indeed, the desiring part as a whole) does so in some way, insofar as it is able to listen to reason and obey it. It has reason, then, in the way we are said to have the reason of our fathers and friends and not in the way we are said to have that of mathematics. The fact that the non-rational part is persuaded in some way by reason is revealed by the practice of warning people and by all the different practices of admonishing and exhorting them.

1103a1 If we must say that it too has reason, however, then the part that has reason will be double as well—one part having it fully and within itself, the other as something able to listen to it as to a father.

Virtues are also defined in accord with this difference; for we say that some are of thought, others of character. Theoretical wisdom, comprehension, and practical wisdom are virtues of thought; generosity and temperance virtues of character. For when we talk about someone's character we do not say that he is theoretically wise or has comprehension but that he is mild-mannered or temperate. But we do also praise a theoretically wise person with reference to his state, and—among the states—it is the praiseworthy ones that we call "virtues."

BOOK 2

2.1
The Importance of Habit

Virtue, then, is twofold, of thought and of character. That of thought both comes about and increases mostly as a result of teaching, which is why it requires experience and time. That of character (*êthikê*), on the other hand, results from habit (*ethos*)—indeed, this is the source of the name *êthikê*, which derives with a minor variation from *ethos*.

From this it is also clear that none of the virtues of character comes about in us by nature; for no natural being can be habituated to be otherwise—for example, a stone that by nature spatially moves downward cannot be habituated to spatially move upward, not even if to habituate it you were to throw it upward ten thousand times, nor fire to move downward, nor can anything else that is by nature one way be habituated into being another way. Therefore, the virtues come about in us neither by nature nor against nature; rather, we are naturally receptive of them and are brought to completion through habit.

Further, in the case of things that are provided to us by nature, we first receive the capacities for them and later exhibit the activities. (Precisely this is clear in the case of the perceptual modalities; for it was not from frequent acts of

seeing or of hearing that we acquired the perceptual modalities; rather, it was the reverse—we used them because we had them, we did not have them because we used them.) The virtues, by contrast, we acquire by first engaging in the activities, as is also true in the case of the various crafts; for the things we cannot produce without learning to do so are the very ones we learn to produce by producing them—for example, we become builders by building houses and lyre players by playing the lyre. In the same way, then, we become just people by doing just actions, temperate people by doing temperate actions, and courageous people by doing courageous ones. **1103b1**

What happens in cities also testifies to this; for legislators make citizens good by habituating them; that is to say, this is the wish of every legislator, and those legislators who do not do it well fail in their purpose, and it is in this respect that one constitution differs from another, a good one from a base one.

Further, it is from the same things and through the same things that each virtue both comes about and is destroyed. The case of a craft is similar as well; for it is from playing the lyre that both good and bad lyre players come about. And something analogous holds in the case of builders and all the rest; for it is from building houses well that good builders arise and from doing so badly, bad ones.

If it were otherwise, there would have been no need whatsoever of a teacher, but people would all have been born either good or bad [craftsmen]. This, then, is also how it is with the virtues; for it is from acting as we do in our transactions with other human beings that some of us become just and others unjust, and from acting as we do in terrible circumstances and from becoming habituated to feel fear or confidence that some of us become courageous and others cowards. Something similar also holds of circumstances involving appetites and those involving feelings of anger; for some people become temperate and mild-mannered, while others become intemperate and irascible—the one group from conducting themselves in one way in such circumstances, the other from doing so in another way. In a word, then, states come about from activities that are similar to them.

That is why the activities must exhibit a certain quality; for the states follow along in accord with the differences between these. It makes no small difference, then, whether people are habituated in one way or in another way straight from childhood; on the contrary, it makes a huge one—or rather, all the difference.

2.2
Ethics Is a Practical Science

Since, then, the present study is not undertaken for the sake of theoretical knowledge, as our others are (for we are engaging in the investigation not in order to know what virtue is but in order to become good people, since otherwise there would be nothing of benefit in it), we must investigate what relates to actions, that

is, in what way they are to be done; for actions also control what sorts of states will come about, as we said.

That one must act in accord with correct reason is a common view and is to be assumed—we will talk about it later, both about what correct reason is and about how it is related to the various virtues.

Let us take it as agreed in advance, however, that the entire account of issues relating to the actions we must do has to be stated in outline and not in an exact way, and—as we said[20] at the start—the sorts of accounts we demand must be in accord with the subject matter. But things in the sphere of action and advantageous things have no fixed identity, just as healthy ones have none.

While that is what the universal account is like, the account dealing with particular cases is still less exact; for these do not fall under any craft or any set of rules whatsoever, and the agents themselves always have to inquire to find out what it is opportune to do, just as in the case of medicine and navigation. But even though this is what the present account is like, one must still try to provide help.

First, then, we must observe that states like these are naturally destroyed by deficiency and excess, just as we see happen in the cases of strength and health (for we must use evident cases to testify on behalf of obscure ones); for both athletic training regimens that are excessive and those that are deficient destroy our strength, and routines of drinking and eating too much destroy our health, while those involving commensurable amounts produce, increase, and preserve it.

It is also that way, then, with temperance, courage, and the other virtues. For the one who avoids and fears everything and endures nothing becomes cowardly, while the one who fears nothing at all and goes to face everything becomes rash. Similarly, the one who indulges in every pleasure and abstains from none becomes intemperate, while the one who avoids all of them, as boorish people do, becomes insensitive in a way. Temperance, then, and courage are destroyed by excess and deficiency and are preserved by the mean.

It is not only that the coming to be, growth, and destruction of the virtues result from the same things and are caused by the same things, however, but also that their activities are found in the same ones; for this holds in the other more evident cases as well—for example, in that of strength; for strength comes about from taking much nourishment and enduring much exertion, and it is a strong person who is most capable of doing these very things.

It is also that way in the case of the virtues; for from abstaining from pleasures we become temperate and, having become so, are most capable of abstaining from them. It is the same way in the case of courage; for if we are habituated to despise frightening things and to endure them, we become courageous and, having become so, are most capable of enduring frightening things.

20. 1094b11–22.

2.3
Pleasure and Pain

We must take the pleasures and pains that supervene on a person's works as a sign of his states; for the one who abstains from bodily pleasures and enjoys doing just this is temperate, while the one who is annoyed is intemperate, and the one who endures terrible things and enjoys doing so—or at least is not pained by it—is courageous, while the one who is pained is cowardly. For virtue of character is concerned with pleasures and pains; for it is because of pleasure that we do base actions and because of pain that we abstain from doing noble ones. That is why we must be brought up in a certain way straight from childhood, as Plato says,[21] so as to enjoy and be pained by the things one should; for the correct education is just that.

Further, the virtues are concerned with actions and feelings, and every feeling and every action are accompanied by pleasure and pain. That is also why virtue is concerned with pleasures and pains. Punishments also reveal this, since they take place by means of pleasure and pain; for punishments are medical treatments of a sort, and medical treatments are naturally effected by means of contraries.

Further, as we said[22] just now, of every state of soul the following holds true: the sorts of things that by nature cause it to become worse or better are the ones it is by nature related to and the ones it is concerned with. Again, it is because of pleasures and pains that people become base—by pursuing and avoiding these, either the ones one should not or when one should not or in the way one should not or in whatever other ways are distinguished in the account. That is also why people define the virtues as a sort of absence of feeling or a sort of being at rest. But they do not define them well if they say this unconditionally and do not add as one should or as one shouldn't, and all the other specifications.

It is assumed, therefore, that virtue is the sort of state concerned with pleasures and pains that is a doer of the best actions, and that vice is the contrary state.

It would become evident to us from the following considerations too that virtue and vice are concerned with the same things. For there are three objects of choice and three of avoidance: the noble, the advantageous, and the pleasant, and their contraries, the shameful, the harmful, and the painful. Concerning all these, the good person tends to be correct and the bad one to err—most of all, though, concerning pleasure; for it is both shared with animals and entailed by every object of choice; for what is noble or what is advantageous appears pleasant too.

Further, pleasure has grown up with all of us from infancy. That is why it is difficult to rub out this feeling that is dyed into our lives. Also, we measure our actions, some more and others less, by the standard of pleasure and pain. That is why, then, **1105^{a}1**

21. *Laws* 653a–c.
22. 1104^{a}27–^{b}3.

our entire study must be concerned with these, since whether someone enjoys or is pained well or badly has no small impact on his actions.

Further, it is more difficult to fight against pleasure than to fight against spirit, just as Heraclitus says,[23] and both craft and virtue are always concerned with what is more difficult; for to do well what is more difficult is in fact a better thing. So that is also why our entire study, both as a contribution to virtue and as a contribution to politics, must be concerned with pleasures and pains; for the one who uses these well will be good and the one who uses them badly will be bad.

Let us say, then, that virtue is concerned with pleasures and pains, that the things from which it comes about are also the ones by which it is increased and (if they come about differently) destroyed, and that the things from which it has come about are also the ones concerning which it is active.

2.4
Action and Character

Someone might raise a puzzle, however, about how we can claim that people must do just actions to become just, and temperate ones to become temperate; for if people are doing what is just or temperate, they are already just and temperate, in the same way that if they are doing what is grammatical or musical, they already know grammar or music.

Or does that not hold in the case of the crafts either? For it is possible to produce something grammatical either by luck or on someone else's instruction. Someone would be a grammarian, then, if he produced something grammatical, and produced it as a grammarian would. And this is to do it in accord with the craft knowledge of grammar that is internal to himself.

Further, the case of crafts is not similar to that of virtues; for the things that come about by means of the crafts have their goodness internal to them, and thus it is enough if they come about in such a way as to be in a certain state. The things that come about in accord with the virtues, by contrast, are done justly or temperately not simply if they are in a certain state but if the one who does them is also in a certain state. First, if he does them knowingly; second, if he deliberately chooses them and deliberately chooses them because of themselves; and third, if he does them from a stable and unchangeable state.

1105b1 As regards the various crafts, these factors do not count, except for the knowing itself. As regards the virtues, however, knowing has little or no strength, while the other factors have not just a little but all the significance, and these are the very ones that come about from frequently doing just and temperate actions.

23. Perhaps at B85 DK.

Actions are said to be just and temperate, then, when they are the sort that a just or temperate person would do, while a just or temperate person is not the one who does these actions but the one who, in addition, does them in the way a just or temperate person does them. So it is correct to say that the just person comes about from doing just actions, and the temperate person from doing temperate ones, and that from not doing them no one could have even the prospect of becoming good.

Ordinary people, however, do not do these actions but, taking refuge in argument, think that they are doing philosophy and that this is the way to become excellent—thus behaving a bit like sick people who listen carefully to doctors but do none of the things that are prescribed. So just as people who take care of themselves in that way will not have a body that is in a good state, people who do philosophy in a similar way will not have souls that are in a good one either.

2.5
Virtue of Character Defined (1)

Next, we must investigate what virtue is. Since, then, the things that come about in the soul are three, feelings, capacities, and states, virtue would be one of these.

By "feelings" I mean appetite, anger, fear, confidence, envy, enjoyment, love, hatred, longing, jealousy, pity, and, in general, whatever is accompanied by pleasure and pain. By "capacities" I mean things due to which we are said to be capable of these feelings—for example, due to which we are capable of feeling anger, fear,[24] or pity. By "states" I mean the things due to which we are well or badly off in relation to feelings—for example, in relation to anger, if we feel it too intensely or too weakly, we are in a bad state; but if to a mean degree, we are in a good one; and similarly in relation to the others.

Virtues and vices are not feelings, then, because we are not called "excellent" or "base" on account of our feelings, while we are so called on account of our virtues and vices. Nor are we praised or blamed on account of our feelings (for it is not the person who fears or gets angry who is praised nor the person who simply gets angry who is blamed but the one who gets angry in a certain way). But we are praised or blamed on account of our virtues and vices. **1106^{a}1**

Further, we become angry or feel fear without deliberate choice, while the virtues are deliberate choices of a sort—or, rather, are not without deliberate choice. In addition, we are said to be moved in accord with our feelings, but in accord with our virtues and vices we are not said to be moved, but to be disposed in a certain way.

Because of these things virtues are not capacities either; for we are not called "good" for having the capacity simply to feel things, nor are we called "bad," nor are

24. Reading φοβηθῆναι.

we praised or blamed. Further, we have the capacities by nature, while we do not become good or bad by nature—we spoke about this earlier.[25]

If, then, the virtues are neither feelings nor capacities, it remains for them to be states. We have now said what the kind of thing virtue is.

2.6
Virtue of Character Defined (2)

We must not say only that virtue is a state, however, but also what sort of state it is.

We must say, then, that every virtue, regardless of what thing it is the virtue of, both completes the good state of that thing and makes it do its work well—as, for example, the virtue of an eye makes both the eye and its work excellent; for it is due to the eye's virtue that we see well. Similarly the virtue of a horse makes the horse excellent—that is, good at running, carrying its rider, and standing firm against enemies. If, then, this holds in every case, the virtue of a human being would also be the state due to which he becomes a good human being and will do his own work well. How that will come about, we have already said.[26] But it will also become evident if we get a theoretical grasp on the sort of nature that virtue has.

In everything continuous and divisible, then, it is possible to take more, less, and equal, and these either in relation to the thing itself or in relation to us—where equal is some sort of mean between excess and deficiency. By "the mean in relation to the thing" I mean what is equidistant from each of its two extremes, which is precisely one in number and the same for all. The mean in relation to us, by contrast, is what takes neither too much nor too little. It is not one thing and is not the same for all. For example, if ten are many and two are few, we take six as the mean in relation to the thing; for it exceeds and is exceeded by an equal amount. That is the mean in accord with arithmetical proportion. But the mean in relation to us must not be ascertained in that way; for if ten minas is a lot to eat and two minas a little, the
1106b1 trainer will not prescribe six minas; for that is presumably also a lot or a little for the person who is to eat it—a little for Milo but a lot for the one starting his athletic training regimen. It is the same way in the cases of running and wrestling. In this way, then, everyone with scientific knowledge avoids excess and deficiency and looks for the mean and chooses it—the mean not in the thing but in relation to us.

If, then, every science does complete its work well in this way, looking to the mean and bringing its works into conformity with it—which is why people regularly say of works that are well made that nothing could be taken away or added (for excess and deficiency destroy what is well done, while the mean preserves what is well done, and good craftsmen, as we say, complete their works by looking to the mean), and if

25. 1103a18–26.
26. Most recently at 1104a11–27.

virtue is more exact and better than any craft, just as nature also is, it would be able to aim at and hit the mean.

I am speaking of virtue of character; for it is concerned with feelings and actions, and it is in these that there is excess, deficiency, and the mean. For example, it is possible to feel fear and confidence, appetite, anger, pity, and pleasure and pain generally, both too much and too little, and in both ways not well.

To feel such things when one should about the things one should, in relation to the people one should, for the sake of what one should, and as one should is the mean and best, and precisely this is characteristic of virtue.

Similarly with actions, there is excess, deficiency, and the mean. Virtue, for its part, is concerned with feelings and actions in which excess is in error, and deficiency subject to blame, while the mean is subject to praise and is on the correct path (and both these features are characteristic of virtue). Virtue, therefore, is a sort of mean because it is able to aim at and hit the mean.

Further, it is possible to err in many ways (for the bad belongs to what is without a limit, as the Pythagoreans portrayed it,[27] and the good to what is determinate), while there is only one way to be correct (that is why indeed erring is easy and being correct difficult, easy to miss the target, but difficult to hit it). Because of these facts too, then, excess and deficiency are characteristic of vice, while the mean is characteristic of virtue: "for people are good in one simple way, but bad in all sorts of ways."[28]

Virtue, then, is a deliberately choosing state, which is in a mean in relation to us, one defined by a reason and the one by which a practically wise person would define **1107ᵃ1** it. Also, it is a mean between two vices, one of excess and the other of deficiency. Further, it is also such a condition because some vices are deficient in relation to what the relevant feelings and actions should be and others are excessive, but virtue both finds the mean and chooses it.

That is why—as regards its substance, and the account that states its essence—virtue is a mean, but, in relation to the best and doing well, it is an extreme.

But not every action or every feeling admits of the mean; for in some cases they are named in such a way that they are united with baseness from the start—for example, rejoicing at another's doing badly, shamelessness, and envy, and (in the case of actions) adultery, theft, and murder; for all these and things like them—and not the excessive varieties of them or the deficient ones—are said to be what they are because they are base. It is never possible, then, to be correct concerning them, but it is necessary always to be in error. Nor is there a doing well or not well concerning such things (committing adultery with whom one should, when one should, in the way one should); rather, simply to do any of these things is to err.

So it is like thinking that there are also means and an excess and a deficiency where unjust, cowardly, and intemperate actions are concerned—since that way, at

27. In their column of contraries.
28. Source unknown.

any rate, there will be a mean of excess and of deficiency and an excess of excess and a deficiency of deficiency. But just as in temperance and courage there is no excess and deficiency, because of the mean being in a way an extreme, so in these other cases too there is no mean and no excess or deficiency either, but, however they are done, they are errors; for, in general, there is neither a mean of excess and deficiency nor excess and deficiency of a mean.

2.7
Individual Virtues of Character

This must not only be stated in universal terms, however, but also adapted to the particular cases. For in accounts concerned with actions, while the universal ones are common to more cases, the ones that apply to a part are truer; for actions are concerned with particulars and our account must be in harmony with them. We must get hold of these, then, from the chart.[29]

As regards feelings of fear and confidence, then, courage is the mean, while of those people who are excessive, the one who is excessive in his fearlessness is nameless (many indeed are nameless), the one who is excessive in his confidence is rash, and the one who is excessively fearful and deficient in confidence is cowardly.

As regards pleasures and pains (not all of them and even less so as regards pains), the mean is temperance and the excess is intemperance. But people deficient in pleasure are scarcely found, which is why people of that sort have not even acquired a name. Let us call them "insensitive."

As regards giving and getting wealth, the mean is generosity, while the excess and deficiency are wastefulness and ungenerosity. In the case of these states, people are excessive and deficient in contrary ways; for the wasteful person is excessive in giving wealth and deficient in getting it, while the ungenerous person is excessive in getting it but deficient in giving. (For the moment we are speaking in outline and in summary, satisfying ourselves with just this much. A more exact definition of these virtues will come later.)

In the case of wealth, there are also other dispositions: the mean is magnificence (for the magnificent person differs from the generous one; for the former is concerned with great sums, the latter with small), the excess is tastelessness and lack of refinement, and the deficiency is niggardliness. These vices differ from the ones having to do with generosity. How they differ will be discussed later.

As regards honor and dishonor, the mean is greatness of soul, while the excess is called a sort of "conceitedness," and the deficiency "smallness of soul." And just as we said generosity was related to magnificence, differing from it in being concerned with small sums, so there is also something related in this way to greatness of soul (which

29. *EE* 1220b38–1221a12.

is concerned with great honor) that is concerned with small honor; for one can desire honor as one should or more or less than one should. The person who is excessive in these desires is said to be an honor-lover, while the one who is deficient in them is indifferent to honor, and the person in a mean nameless. Also nameless are the corresponding dispositions, with the exception of that of the honor-lover, which is called "love of honor." That is why the extremes lay claim to the middle ground—that is, we sometimes say that the person in a mean is an honor-lover and sometimes that he is indifferent to honor, and sometimes we praise the honor-lover and sometimes the one who is indifferent to honor. Why we do this will be discussed in what follows.[30] **1108ᵃ1** But for now let us speak about the rest in the normal way.[31]

There is also excess, deficiency, and a mean in the case of anger, but, since these are pretty much nameless, and since the one in the mean is said to be mild-mannered, let us call the mean "mild-manneredness." Among those at the extremes, let an excessive one be irascible and his vice irascibility, and let a deficient one be a sort of spiritless person, and his vice spiritlessness.

There are also three other means that have a certain similarity to each other but differ from each other; for all of them are concerned with communal relations in words and actions; but they differ because one is concerned with the truth in them while the others are concerned with what is pleasant—in amusements, in the case of one, and in what bears on life generally, in the case of the other. Let us talk, then, about these too, in order to see more clearly that in all cases the mean is praiseworthy, while the extremes are neither praiseworthy nor correct but blameworthy. Of these, most are also nameless. But we must try, just as in the other cases, to make up names for them ourselves for the sake of perspicuity and ease in following.

As regards truth, then, let us call the person in a mean the "truthful" sort, and let us call the mean "truthfulness." Pretense that exaggerates will be boastfulness and the one who has it will be boastful. Pretense that minimizes will be self-deprecation and the one who has it will be a self-deprecator.

As regards the pleasant in amusements, the person in a mean is witty and the disposition is wit. The excess is buffoonery and the one who has it is a buffoon, while the deficient person is a sort of boor and the state boorishness. As regards the remainder of the pleasant (that in life generally), let us call "friendly" a person who is pleasant in the way one should be, and the mean friendliness. The excessive person (if he is not so for the sake of something specific) will be ingratiating or (if he is so for his own benefit) a flatterer. And the deficient person (who is unpleasant in everything) will be a quarrelsome sort of person and disagreeable.

There are also means in feelings and concerned with feelings; for shame is not a virtue, yet the person with a sense of shame is praised as well. And in these cases, in fact, one person is said to be in a mean, while another is said to be excessive (as in the

30. 1125ᵇ8–17.
31. 1107ᵇ14–15.

case of a bashful person, who is ashamed of everything). The one who is deficient in shame or who does not feel it at all is shameless. And the person in a mean is said to have a sense of shame.

Indignation is a mean between envy and rejoicing at another's doing badly, all of which are concerned with pleasure and pain at what happens to neighbors. The indignant person is pained by those who do well undeservedly. The envious person exceeds him in being pained by everyone's doing well, while the person who rejoices at another's doing badly is so deficient in being pained that he even enjoys this.

There will be an opportunity to discuss these issues later. But, as regards justice, since it is not said of things only unconditionally, we will (after that) distinguish its two varieties and say in what way each is a mean—and, similarly, as regards the virtues of reason.

2.8
Means and Extremes

There are three dispositions, then, two of which are vices (one of excess and the other of deficiency) and one a virtue (the mean), and all of them are opposed to each other in a way; for the extremes are contrary both to the mean and to each other, and the mean to the extremes; for just as the equal is greater when compared to the smaller and smaller when compared to the greater, so the mean states are excessive both in feelings and in actions when compared to the deficiencies and deficient when compared to the excesses. For the courageous person appears rash when compared to the coward and cowardly when compared to the rash one. Similarly, the temperate person appears intemperate when compared to the insensitive person and insensitive when compared to the intemperate one, and the generous person appears wasteful when compared to the ungenerous person and ungenerous when compared to the wasteful one. That is why each of the extreme people pushes the one in a mean toward the other extreme—that is to say, the coward calls the courageous person "rash" and the rash person calls him a "coward," and analogously in the other cases.

While they are opposed to each other in this way, however, the greater contrariety is that of the extremes when compared to each other rather than when compared to the mean; for they are further from each other than from the mean (as the great is further from the small and the small further from the great than either is from the equal).

Further, when compared to the mean, some extremes appear to have a certain similarity to it, as rashness does when compared to courage or wastefulness when compared to generosity. The greatest dissimilarity, however, appears to be that of the extremes when compared to each other. But things that are furthest from each other are defined as contraries, so that things that are further apart are also more contrary.

When compared to the mean, the deficiency is more opposed to it in some cases, and the excess in others. For example, it is not rashness (the excess) that is more opposed to courage but cowardice (the deficiency), while it is not insensitivity (the deficiency) but intemperance (the excess) that is more opposed to temperance.

This happens due to two causes. One derives from the thing itself; for because it is closer to the mean and more similar to it, we regard not it but its contrary as more opposed to the mean. For example, since rashness seems to be more like courage and closer to it, and cowardice less similar, we regard cowardice as more opposed; for things further from the mean seem to be more contrary to it. This, then, is one cause, deriving from the thing itself.

The other derives from ourselves; for the things that we ourselves are naturally more inclined toward are the ones that appear more contrary to the mean. For example, we are naturally more inclined toward pleasures, which is why we are more easily drawn toward intemperance than toward moderation. It is these things, then, that we say are more contrary—the ones we go more toward. That is why it is intemperance (the excess) that is more contrary to temperance.

2.9
Achieving the Mean

That virtue of character is a mean, then, and in what way, that it is a mean between two vices (one of excess and the other of deficiency), and that it is such because it is able to aim at and hit the mean both in feelings and in actions, has been adequately stated.

And that is why it takes work to be excellent. For in each case it takes work to find the mean (*meson*)—for example, not everyone can find the midpoint (*meson*) of a circle, but the one with knowledge. In the same way, getting angry is also something everyone can do and something easy, as is giving or spending money. But determining who to give it to, how much, when, for the sake of what, and in what way—that is no longer something everyone can do or something easy. That is why doing it well is a rare thing and a praiseworthy and noble one.

That is why a person who is aiming to hit the mean must first steer clear of what is more contrary to it, as Calypso too advises: "from that surge and spray keep your ship well clear."[32] For one of the extremes is more in error, the other less. Since, then, it is extremely difficult to hit the mean, the second-best course, as they say, is to ascertain the lesser of the evils, and that will best be done in the way we say.

We must also investigate what we ourselves are more inclined toward; for different people are naturally inclined toward different things. This will become known to us from the pleasure and pain that the things bring about in us. And it is in the contrary

32. Homer, *Odyssey* 12.219–220. Circe, not Calypso, gives this advice.

direction that we must drag ourselves off; for it is by pulling well away from error that we will attain the mean—precisely as people do in rectifying distorted pieces of wood.

In everything, we must most of all guard against the pleasant—that is, pleasure; for we are not unbiased judges of it. Precisely the way, then, that the elders of the people felt about Helen,[33] that is the way we ourselves should feel about pleasure, and on each occasion we should repeat what they uttered; for that way we will send it off and be less in error.

To sum up, then, if we do these things, we will be most able to hit the mean. But presumably it is difficult to hit it, most of all in the realm of particulars; for it is not easy to define how, with whom, about what, or for how long a time one should be angry; for sometimes indeed we ourselves praise people who are deficient in anger, saying that they are mild-mannered, and sometimes those who are harsh, calling them "manly."

It is not the person who deviates a little—whether toward excess or toward deficiency—who is blamed, however, but one who does so a lot; for someone like that does not escape notice. But up to what point and to what extent one's deviation is blameworthy is not easy to define in an account—nor indeed is anything else among perceptibles. Such things lie in the particulars, and their discernment in perception.

This much, therefore, makes clear that the mean state is praiseworthy in all cases but that we should sometimes incline toward excess and sometimes toward deficiency; for that way we will most easily hit the mean and do well.

BOOK 3

3.1
Voluntary and Involuntary Action

Since virtue is concerned with feelings and actions, then, and it is the voluntary ones that are praised and blamed, while the involuntary ones elicit sympathetic consideration and are sometimes even pitied, it is perhaps necessary for those who are investigating issues relating to virtue to make some determinations about the voluntary and the involuntary. This is also useful to legislators regarding honors and punishments.

The involuntary seems to be what comes about by force or because of ignorance. **1110a1** Also, what is forced is what has a starting-point that comes from outside, that is, the sort of starting-point where the agent, or the one being affected, contributes nothing—as, for example, if the wind or human beings with control over him took him off somewhere.

33. Homer, *Iliad* 3.156–160.

Actions done because of fear of greater evils or because of something noble—for example, if a tyrant with control over one's parents and children ordered one to do something shameful and, if one does it, they would be saved, while, if one does not do it, they would be put to death—give rise to disputes about whether the actions are involuntary or voluntary.

The same sort of dispute also arises about cases of throwing cargo overboard in a storm; for no one simply throws it overboard voluntarily, but to preserve himself and all the rest, anyone with understanding does do it.

These sorts of actions are mixed, then, although they more closely resemble voluntary ones; for they are choiceworthy at the time when they are done, and the end of the actions is in accord with the opportune moment. Both voluntary and involuntary, then, must be ascribed with reference to the time at which the agent does these actions. And the agent does do them voluntarily; for in fact the starting-point of his moving his instrumental parts in actions of this sort is internal to himself, and—because the starting-point is internal to himself—it is also up to him whether to do them or not. Such actions, then, are voluntary. Unconditionally, though, they are presumably involuntary; for no one would choose anything of this sort for what it intrinsically is.

People are sometimes even praised for actions of this sort, when they endure something shameful or painful in exchange for great and noble things, while if it is the reverse, they are blamed; for to endure the most shameful things for something not at all noble or only moderately so is characteristic of the base person. And in some cases it is not praise we give but sympathetic consideration, when someone does some action one should not do because of things that overstrain human nature and that no one could endure.

In some cases, however, there is presumably no being compelled. On the contrary, rather than do them one should die having suffered the most terrible things; for in fact the things that compelled Euripides' Alcmaeon to kill his mother are manifestly ridiculous.[34]

But it is sometimes difficult to distinguish what must be chosen in exchange for what or what must be endured in exchange for what, and more difficult still to stand by what we have determined; for, as the expected consequences are for the most part painful, what we are compelled to do is shameful. That is what leads people to give praise or blame to those who are compelled or not compelled.

What sorts of things, then, must we say are forced? Or is it that things are unconditionally forced when their cause lies in external factors and the agent contributes nothing? But the ones that are intrinsically involuntary, though choiceworthy on this occasion in exchange for these things, and where the starting-point is internal to the agent—these, though intrinsically involuntary, are, on this occasion and done in exchange for these things, voluntary. But they more closely resemble voluntary **$1110^{b}1$**

34. Aristotle refers to the lost *Alcmaeon* from which he quotes at $1136^{b}13$–14.

ones; for the actions lie in the particulars and these particular actions are voluntary. But what sorts of things must be chosen in exchange for what is not easy to give an account of, since there are many differences in the particulars.

If someone were to say that pleasant things and noble things force us (for they are external and compel us), then for him everything would be forced; for everyone does every action for the sake of these. Moreover, people who are forced to act and act involuntarily find it painful, while those who act because of the pleasant or the noble do it with pleasure. It is ridiculous, then,[35] for the agent to hold external things responsible but not himself for being easily ensnared by such things, and to hold himself responsible for his noble actions but pleasant things responsible for his shameful ones.

What comes about by force, then, seems to be that whose starting-point is external, nothing being contributed by the one who is forced.

All of what is done because of ignorance, however, is not voluntary, although it is contra-voluntary when involving pain and regret; for the person who has done whatever it is because of ignorance, but sees nothing repulsive in his action, has not acted voluntarily, because he did not know what he was doing. But neither has he acted contra-voluntarily, because he is not pained by it. Among those people, then, who act because of ignorance, the one who regrets what he did seems a contra-voluntary agent. The one who does not regret, since he is a different case, let him be a "non-voluntary" agent; for since he is different, it is better for him to have a special name.

Acting because of ignorance, however, seems to be different from acting in ignorance; for the person who is drunk or angry does not seem to act because of ignorance but because of one of the conditions mentioned, although he does not act knowingly but in ignorance. But every depraved person is ignorant of the things one should do and the things one should abstain from, and it is because of this sort of error that unjust people—and bad people generally—come about.

But a case is not meant to be called "involuntary" if someone is ignorant of what things are advantageous; for ignorance in our deliberate choice is not a cause of something's being involuntary but of depravity, and ignorance of the universal (for people are blamed for ignorance of this sort) is not a cause either, but ignorance of the particulars in which the action lies and with which it is concerned; for in these lie the basis for both pity and sympathetic consideration; for it is the person who is ignorant of one of these particulars who acts involuntarily.

Perhaps it is not a bad thing, then, to make some determinations about these, what they are and how many they are. When someone acts, then, we can ask, who? what? concerning what? or, in what? and sometimes, with what? (for example, with what instrument?), for the sake of what? (for example, preservation), and, in what way? (for example, weakly or intensely).

35. Reading δὴ.

No one who is not a madman could be ignorant about all of these or, clearly, about who is doing the action; for how could he be ignorant about himself? But about what he is doing, he might be ignorant, as when people say that things just slipped out while they were talking or that they didn't know they were a secret, as Aeschylus said about the Mysteries or that they wished to do a demonstration and it went off, as the man said about the catapult. Or someone might think that her son was the enemy, as Merope did,[36] or that a spear had a guard on the point or that the stone was pumice stone or he might give someone a drink with a view to preserving his life but end up killing him or mean to give someone a light tap (as sparring partners do) and knock him out.

Since about all these things ignorance is possible and these are the ones in which the action lies, the person who is ignorant of one of them seems to have acted involuntarily—most of all so if he is ignorant of the ones with the most control. And the ones with the most control seem to be the ones in which the action lies and what it is for the sake of. What is called "involuntary" on the basis of this sort of ignorance, then, must also cause pain and regret.

Because the involuntary consists, then, of what comes about by force or because of ignorance, the voluntary would seem to be what has its starting-point in the agent himself, when he knows the particulars in which the action lies.

For actions done because of spirit or appetite are presumably not correctly said to be involuntary. For, first of all, none of the other animals will then act voluntarily and neither will children. Second, are none of the actions we do because of appetite or spirit done voluntarily, or are the noble ones voluntary and the shameful ones involuntary? Or is that certainly ridiculous, since they have a single cause? But presumably it is strange to call the things we should desire "involuntary." And one should be angry at certain things and have an appetite for certain things—for example, health and learning. It also seems that involuntary things are painful, while those in accord with appetite are pleasant.

Further, what difference in involuntariness is there between errors made on the basis of rational calculation and those made on the basis of spirit? Both indeed are to be avoided. But the non-rational feelings seem to be no less human, so that actions resulting from spirit and appetite are no less the actions of human beings. It would be strange, then, to count them as involuntary. **1111**[b]**1**

3.2
Deliberate Choice

Now that we have made these determinations about the voluntary and the involuntary, the next task is to discuss deliberate choice; for it seems to belong most properly to virtue and to better distinguish people's characters than their actions do.

36. In Euripides' lost play *Cresphontes* (*Po*. 1454[a]5–7).

Deliberate choice, then, is apparently something voluntary, although not the same as the voluntary (which extends more broadly); for children and other animals share in the voluntary but not in deliberate choice, and sudden actions are voluntary, we say, but are not in accord with deliberate choice.

Those who say[37] that deliberate choice is appetite, spirit, wish, or some sort of belief do not seem to be correct. For deliberate choice is not something shared by non-rational creatures, while appetite and spirit are. Also, a person who lacks self-control acts from appetite but not from deliberate choice, while a person who has self-control does the reverse, acting from deliberate choice but not from appetite. Also, appetite is contrary to deliberate choice but not to appetite. Also, appetite is concerned with the pleasant and the painful, while deliberate choice is concerned neither with the painful nor with the pleasant. Still less is deliberate choice spirit; for actions done because of spirit seem least of all to be in accord with deliberate choice.

Then again, it is not wish either, although it appears to be a close relative of it; for there is no deliberate choice of impossible things, and if someone were to say he was deliberately choosing them, he would seem silly. But there is wish[38] for impossible things—for example, immortality. There is also wish concerning the sorts of things that could never come about through ourselves—for example, that a certain actor or athlete win a victory prize. No one, however, deliberately chooses things like that, but things he thinks can come about through him. Further, wish is more for the end, while deliberate choice is of the things that further the end. We wish to be healthy, for example, but we deliberately choose the things through which we will be healthy. We wish to be happy too, and say so, while it is not fitting to say that we deliberately choose to be happy; for deliberate choice in general seems to be concerned with what is up to us.

Neither, then, would it seem to be belief; for belief seems to be concerned with all things and no less concerned with eternal ones and impossible ones than with ones that are up to us. And beliefs are divided into false and true, not into bad and good, while deliberate choices are more divided into bad and good.

Presumably no one does claim that deliberate choice is the same as belief in general, but neither is it the same as a specific sort of belief; for it is by deliberately choosing good things or bad things that we are people of a certain sort, not by believing them. Also, we deliberately choose to take or avoid some such thing, while we have beliefs about what it is or to whose advantage it is or in what way. But whether to take it or avoid it is scarcely something we hold a belief about. Also, deliberate choice is praised more for being of what it should be of, or for correctness in this sense, while belief is praised for being true. Also, we deliberately choose things that we most know to be good, while we have beliefs about things we scarcely know to be good. Also, the people who make the best deliberate choices do not seem to be the same as the ones who

37. Reference unclear.

38. Rejecting the addition of καὶ.

form the best beliefs, on the contrary, some people form better beliefs but because of vice choose what one shouldn't. Whether there is belief preceding deliberate choice, or following it, makes no difference; for it is not this we are investigating but whether deliberate choice is the same as a specific sort of belief.

What, then, or what sort of thing, is deliberate choice, since it is none of the ones we mentioned? To be sure, it is something voluntary, apparently, although not everything voluntary is deliberately chosen. But is it something reached by prior deliberation at least? For deliberate choice involves reason and thought, and even its name (*prohairesis*) seems to signify something's being worthy of choice (*haireton*) before (*pro*) other things.

3.3
Deliberation

Do people deliberate about everything, and is everything an object of deliberation, or are there some things about which there is no deliberation? And presumably one must call an "object of deliberation" not what a silly sort of person or a madman would deliberate about but what a person with understanding would.

No one deliberates about eternal things, then, about the universe, for example, or about the fact that the diameter and sides of a square are not proportional; or about things that include change but that always come about in the same way, whether from necessity (or indeed by nature) or due to some other cause, such as the solstices or the risings of the heavenly bodies; or about things that happen sometimes in one way, sometimes in another, such as droughts and rains; or about things that come about by luck, such as discovering a treasure; or about all human affairs either—for example, no Spartan deliberates about the best constitution for the Scythians; for none of these things comes about through ourselves.

We do deliberate, though, about things that are up to us and doable in action, and these in fact are the remaining ones. For the causes of things seem to be nature, necessity, luck, and further, understanding and everything that comes about through a human being. Among human beings, however, each group deliberates about what is doable in action through itself.

There is no deliberation, however, about sciences that are both exact and self-sufficient—about orthography, for example, since we have no hesitation about what way to write the letters. We do deliberate, however, about those things that come about through ourselves but not always in the same way (for example, about the things that medicine or moneymaking deals with). And we deliberate more about navigation than about athletic training, insofar as navigation has been less exactly worked out. Further, deliberation is involved in a similar way about the rest, but more about crafts than about sciences, for we are more hesitant about them.

Deliberation is found, then, in the sphere of what holds for the most part but where it is unclear what way things will turn out and where there is an element of indefinability. And we call on partners in deliberation on important questions, when we mistrust ourselves as not being adequate to determine the answer.

We deliberate not about ends, but about the things that further ends. For a doctor does not deliberate about whether to cure or an orator about whether to persuade or a politician about whether to produce good legislative order, nor do any of the rest deliberate about their end. Rather, they take the end for granted and investigate in what way and through which things it will come about. And if it appears that it can come about through several, they investigate through which ones it will most easily and best come about. But if it is brought to completion through only one, they investigate in what way it will come about through this and through which things it, in turn, will come about, until they arrive at the first cause, which is the last thing in the process of discovery. For a deliberator seems to inquire and analyze in the way we said just as though he were dealing with a diagram—but while it is evident that not all inquiry is deliberation (for example, mathematical inquiry), all deliberation is inquiry, and the last thing found in the analysis seems to come first in bringing about the result.

Also, if people encounter something impossible, they give up (for example, if wealth is needed but there is no way to provide it), while if it appears possible, they set about doing the action. But possible things are those that could come about through ourselves; for what comes about through our friends comes about through ourselves in a way, since the starting-point is in us.

We inquire sometimes about instruments, sometimes about what way they are to be used, and similarly for the rest—sometimes through whom, sometimes in what way, and sometimes through which things.

It seems, then, as we said,[39] that a human being is a starting-point of actions and that deliberation is about what is doable in action by him, while the actions are for the sake of other things. For what is deliberated about is not the end but the things that further ends, and neither, of course, is it particulars (for example, whether this thing is a loaf or whether it is cooked in the way it should be); for these are matters for perception. And if we deliberate at every point, we will go on without limit.

Objects of deliberation and objects of deliberate choice are the same, except that objects of deliberate choice are already something determinate; for it is what has been judged as a result of deliberation that is an object of deliberate choice. For each of us stops inquiring about what way to act when he brings back the starting-point to himself and, within himself, to the leading element, since this is what deliberately chooses. This is also clear from the ancient constitutions that Homer described; for it is what kings had deliberately chosen that they announced to the common people.

Since an object of deliberate choice is an object of deliberation and of desire that is among the things that are up to us, deliberate choice too would be a deliberative

39. 1112b28.

desire of things that are up to us; for having judged as a result of deliberation, we desire in accord with our deliberation.

So much, then, by way of an outline of deliberate choice, of the things it is concerned with, and that it is about the things that further ends.

3.4
Wish

Wish is for the end, as we said,[40] but some people think it is for the good, others that it is for the apparent good.

But for those who say that the object of wish is the good, it follows that when someone who has not chosen correctly wishes for something, what he wishes for is not an object of wish at all (for if it is an object of wish, it will also be a good thing, but, as it happens, it was a bad one).

But for those who say that the object of wish is the apparent good, it follows that nothing is by nature an object of wish, but what seems good to each person is so, with different things—even contrary ones, as it happens—appearing so to different ones.

If, then, these results do not satisfy us, must one therefore say that unconditionally and in truth the object of wish is the good, but to each person it is the apparent good? To the excellent person, it is what is truly the object of wish; to a base one, it is whatever random thing it happens to be. It is just the same in the case of bodies. The things that are healthy for those with good dispositions are the ones that are truly healthy, while for those that are diseased, it is different ones, and similarly with bitter, sweet, hot, heavy, and each of the others; for the excellent person judges each of them correctly and in each case, what is true is apparent to him.

For each state has its own special set of things that are pleasant or noble, and the excellent person is perhaps distinguished most by his seeing what is true in each case, since he is like a standard and measure of them. In the case of ordinary people, however, deception seems to come about because of pleasure, which appears to be a good thing when it is not. They choose the pleasant, then, as good and avoid the painful as bad. **1113b1**

3.5
Character and End

Since, then, wish is for the end, and the objects of deliberation and of deliberate choice are things that further the end, actions concerned with these would be in accord with deliberate choice and voluntary. Also, the activities of the virtues are concerned with these things.

40. 1111b26.

Virtue too is up to us, then, and, similarly, vice; for where acting is up to us, so is not acting. And where to not act [is up to us], also to not act [is up to us], so that if acting, when it is noble, is up to us, not acting, when it is shameful, will also be up to us. And if not acting, when it is noble, is up to us, acting, when it is shameful, will also be up to us. But if doing noble actions or doing shameful ones is up to us and, similarly, also not doing them (which was what being good people and being bad people consisted in), then being decent or base will be up to us.

To say that no one is voluntarily wicked or involuntarily blessed seems to be partly false and partly true; for, while no one is involuntarily blessed, depravity is a voluntary thing.

Or must we dispute what has been said[41] just now and say that a human being is not a starting-point or begetter of his actions as of his children? But if what we have said does appear to be the case and we cannot refer our actions back to any starting-points beyond the ones in us, then, since they are indeed things that have their starting-points in us, they themselves are also up to us and voluntary.

The behavior of private individuals and of legislators themselves seems to testify to this; for they punish and take revenge on anyone who does a depraved action, provided it was not forced or done because of ignorance for which he himself was not responsible, while they honor anyone who does noble actions, on the supposition that this will encourage the one and prevent the other. And further, no one encourages us to do actions that are neither up to us nor voluntary, on the supposition that for us to be persuaded not to feel hot, suffer, feel hungry, or anything of this sort is pointless; for being persuaded will not make us feel these things any less. For they also punish someone for ignorance itself, if he seems to be responsible for the ignorance—as, for example, when penalties are doubled in cases of drunkenness; for the starting-point is in the agent; for not to get drunk was in his control and that was what was responsible for his ignorance. Also, they punish someone for ignorance of things in the laws that one should have scientific knowledge of and that are not
1114a1 difficult, and similarly in other cases where someone seems to be ignorant because of neglectfulness, on the supposition that it is up to him not to be ignorant; for to take care was in his control.

Presumably, though, he is the sort of person not to take care. But people are themselves responsible for becoming like that because of living in a loose way, and for being unjust or intemperate because of malice or because of spending their time drinking and the like; for it is the activities in each case that produce people of the corresponding character. This is clear from those who practice for any sort of competition or action, since they practice the relevant activity continually. To be ignorant, then, that in each case it is from engaging in the activity that the corresponding state comes about is characteristic of an altogether insensitive person.

41. 1112b31–32, explained 1113a5–7.

Further, it is unreasonable to suppose that the person who is acting unjustly does not wish to be unjust or that someone doing intemperate actions does not wish to be intemperate. But if someone non-ignorantly does the actions that would result in his being unjust, he will be voluntarily unjust. This does not mean that if he wishes, he will stop being unjust and will be just instead. For the diseased person will not be healthy that way either, even if, as it happens, he is diseased voluntarily because of living a life that lacks self-control and disobeying his doctors. At one time, certainly, it was possible for him not to be sick. Once he has let himself go, however, it is no longer possible, just as when someone has let a stone go it is no longer possible for him to get it back. Nonetheless, throwing it was up to him; for the starting-point was in him. In the same way, it was possible at the start for the unjust and the intemperate person not to become like that, which is why such people are voluntarily unjust and intemperate. But once they have become like that, it is no longer possible not to be.

It is not only vices of the soul that are voluntary, but in some cases vices of the body are as well—these being the ones that we also admonish; for no one admonishes people who are by nature ugly, but those who are so because of lack of athletic training or neglectfulness. It is the same way in the case of those who are weak or disabled; for no one would admonish someone who was by nature blind or blind as the result of a disease or as the result of a blow but would rather pity them, while those who are so as a result of drunkenness or of other sorts of intemperance everyone would admonish. Among the vices of the body, then, it is the ones that are up to us that are admonished, while those that are not up to us are not. And if that is so, then also in other cases the vices that are admonished would be the ones that are up to us.

Suppose that someone were to say that everyone aims at the apparent good but that we do not control its appearance. Instead, whatever sort of person each of us happens to be also determines the sort of end that appears to him. But if each individual is somehow responsible for his own state [of character], he is also somehow responsible for the appearance in question. If not, no one is responsible for his own malice but does these things because of ignorance of the end, thinking that because of doing them he will achieve what is best for him. His seeking of the end in question is not self-chosen; rather, we must be born possessed of a sort of sight by which to discern correctly and choose what is truly good, and a person in whom this by nature operates correctly is naturally well-disposed; for this is what is greatest and noblest and is not the sort of thing we can get from someone else or learn but the sort of thing whose condition at birth is the one in which it will later be possessed and, when it is naturally such as to be in a good and noble condition, would be the naturally good disposition of the complete and true sort.

If all this is true, then, how will virtue be any more voluntary than vice? For to both the good and the bad alike the end appears—or is determined by nature or by whatever it is—and whatever other actions they do, they do with reference to that end. If it is not by nature, then, that the end appears to each person in whatever way it does, but there is also something contributed by the person himself or, if the end is

something natural, but the excellent person's virtue is voluntary because he does the rest of the actions voluntarily, vice would be no less voluntary than virtue. Similarly, in the case of the bad person there is something that comes about in his actions through himself, even if not in his end. If, then, as is said, the virtues are voluntary (for we are in a way ourselves contributing causes of our states, and it is by being people of a certain sort that we suppose the end to be so-and-so), the vices would also be voluntary; for the two are alike.

We have now discussed in outline the virtues collectively and their kind, saying that they are means and states, that the sorts of things they arise from are the very sorts virtues lead us to do in accord with themselves, and that they are up to us and voluntary and such as correct reason prescribes.

But actions and states are not voluntary in the same way; for we control our actions from their starting-point up to their end because we know the particulars. With states, however, we control their starting-point, but the particulars of their **1115a1** development are not known to us any more than with diseases. But because it was up to us to use the states in a given way or not in that way, they are voluntary.

Let us resume and, as regards each particular virtue, say what it is, what it is concerned with, and in what way. It will be clear at the same time how many they are.

3.6
Courage (1)

First, let us discuss courage. That there is a mean concerned with feelings of fear and confidence is something that has already become evident. It is clear too that what we fear are frightening things and that these—unconditionally speaking—are bad things. That is why people define fear as expectation of what is bad.

We certainly do fear all bad things (for example, disrepute, poverty, disease, friendlessness, and death) but they do not all seem to concern the courageous person; for there are some that one should in fact fear, where fearing is noble and not fearing shameful—for example, disrepute; for a person who fears this is decent and has a sense of shame, while one who does not fear it is shameless. But some do say that such a person is courageous, by extension of the term; for he has some similarity to the courageous person; for the courageous person is also in a way fearless.

Poverty, however, is presumably something one should not fear; neither is disease nor, in general, things that are not the results of vice or of ourselves. But the person who is fearless where they are concerned is not courageous either, although he too is called so by similarity; for some people who are cowards when facing the dangers of warfare are generous and face the loss of wealth with good confidence.

Neither, then, is someone cowardly if he fears wanton aggression against his children or wife or if he fears envy or anything like that. Nor is he courageous if he is confident when he is about to be flogged.

What sorts of frightening things, then, is the courageous person concerned with? Or isn't it with the greatest ones? For no one is better at enduring frightening things. And the most frightening one is death; for it is a boundary point and for the dead person it seems that nothing is any longer either good or bad.

But the courageous person would not seem to be concerned with death in all circumstances either—for example, on the sea or in sickness. In what sorts, then? Or isn't it in the noblest ones? And deaths that occur in war are of that sort; for they occur in the face of the greatest and noblest danger, and this fits with the honors awarded in cities and by monarchs.

The person who is said to be courageous in the strict sense, then, is the one who is unanxious about noble death and the things that are an imminent threat of death; and the things that occur in war are most of all of this sort.

On the sea too, of course, and in facing diseases, the courageous person is unanxious, but not in the way that seamen are; for while courageous people have despaired of preserving their life and are repelled by a death of this sort, seamen remain optimistic in keeping with their experience. At the same time, people also show courage in circumstances in which a display of prowess is possible or in which it is noble to die, and neither holds in destructive cases of this sort.

3.7
Courage (2)

What is frightening is not the same for everyone, but some sorts of things, we say, are actually beyond the human level. These, then, are frightening to everyone—at any rate, to everyone with understanding. And those that are frightening on the human level differ in magnitude, that is, some are more frightening, some less, and similarly with things that inspire confidence.

The courageous person, however, is as undaunted as a human being can be. Though he will also fear such things, then, he will endure them in the way one should, in the way reason abides, and for the sake of the noble; for this is the end characteristic of virtue.

It is possible to fear these frightening things more, or less. Further, it is also possible to fear things that are not frightening as if they were. And of the ways error comes about, one is that one fears what one shouldn't, another is that one does so in the way one shouldn't, or when one shouldn't, or something else of that sort. It is the same way with the things that inspire confidence.

The person is courageous, then, who endures and fears the things one should, for the sake of what one should, in the way one should, when one should, and is similarly confident; for the courageous person feels and acts as things merit and in the way reason prescribes.

But the end of every activity is what is in accord with the corresponding state. This also holds, then, for the courageous person. But courage is something noble.[42] The corresponding end, then, is also such; for each thing is defined by its end. It is for the sake of what is noble, then, that the courageous person endures things and does the actions that are in accord with courage.

Among those who go to excess, the one who is excessive in his fearlessness is nameless (we said earlier[43] that many are nameless) but would be some sort of madman or insensitive to suffering if he feared nothing—"neither earthquake nor waves,"[44] as they say of the Celts. But the one who is excessively confident concerning frightening things is rash.

The rash person also seems to be a boaster and a pretender to courage. At any rate, the way that the courageous person is concerned with frightening things is the way a rash person wishes to appear to be concerned with them; and thus he imitates the courageous person in those situations where he is able. That is why most rash people are actually rash cowards; for, while they are rash in such situations, they do not endure frightening things.

The excessively fearful person, on the other hand, is a coward; for in fact he fears the things one shouldn't, in the way one shouldn't, and all the other things of that sort follow in his case. He is also deficient in confidence; but his being a coward is more
1116a1 obvious in his being excessive in the pains he feels.

The coward, then, is in a way despondent; for he fears everything. And a courageous person is the contrary way; for to be confident is characteristic of an optimistic person.

So the coward, the rash person, and the courageous person are all concerned with the same things but have states that are differently related to them; for the others are excessive and deficient, but the courageous person has the mean state, and is as one should be. Rash people are also impetuous and wish for dangers ahead of time but shrink from them when in their midst, while courageous people are quick spirited when there are things to be accomplished but at peace beforehand.

As we said, then, courage is a mean concerned with things that inspire confidence and fear in the circumstances we have described, and courage makes choices and endures things because it is noble to do so or shameful not to. Also, dying to avoid poverty, sexual desire, or something painful is the mark not of a courageous person, but rather of a coward; for to flee from painful labors is characteristic of softness, and someone like that faces up to death not because it is noble but because he is fleeing something bad.

42. Reading καὶ τῷ ἀνδρείῳ δή. ἡ <δ'> ἀνδρεία καλόν.
43. 1107b1–2.
44. Apparently a quotation.

3.8
Courage-Like Conditions

Courage, then, is something of this sort. But there are other things so called, which are of five sorts. First comes political courage; for it is most like courage. For citizens seem to endure dangers because of the penalties prescribed by the laws, because of people's reproaches, and because of the honors involved. And that is why the most courageous seem to be those among whom cowards are dishonored and courageous people honored.

Homer too depicts people of this sort—for example, Diomedes and Hector: "Polydamas will be the first to heap disgrace on me," and "One day Hector will say among the Trojans, 'The son of Tydeus fleeing me'."[45] This is most similar to the sort we previously discussed,[46] in that it comes about because of virtue; for it comes about because of a sense of shame, because of a desire for something noble (for honor is that), and to avoid reproach (for reproach is shameful).

Someone might also put in the same class those who are compelled by their rulers. But these are not as good, because they do what they do not because of a sense of shame but because of fear and in order to avoid not the shameful but the painful; for the people in control compel them to do it in the way that Hector does: "If I see anyone cringing in fear far away from the battle, he will not, you can be sure, avoid being thrown to the dogs."[47] And commanders who beat people if they retreat are doing the same thing, as are those who draw up their men in front of trenches or things of that sort; for they are all exerting compulsion. One should be courageous **1116^{b}1** not because of compulsion, however, but because it is noble.

Experience in particular areas also seems to be courage, which is why Socrates too thought that courage is scientific knowledge.[48] Different sorts of people, however, have experience in different areas, but in matters of warfare, it is the professional soldiers; for there seem to be many occasions that are empty of danger in war, and the professional soldiers are most capable of seeing these at a glance. They appear courageous, then, because the others do not know what sorts of situations these are. Again, as a result of their experience, they are most capable of attacking and of defending—capable of using their weapons and having the sorts that are strongest both for attacking and for defending. They are like armed men, then, contending with unarmed ones, or trained athletes against private individuals; for in contests of this sort as well, it is not the most courageous who are the best fighters but those whose strength is greatest and whose bodies are in the best condition.

45. *Iliad* 22.100 (the speaker is Hector), 8.148–149 (the speaker is Diomedes).
46. 12.6–7.
47. Homer, *Iliad* 2.391–393 (the speaker is Agamemnon).
48. E.g., Plato, *Laches* 199a–b, *Protagoras* 360d.

Professional soldiers turn out to be cowards, however, when the danger overstrains them and they are inferior in numbers and equipment; for they are the first to flee, while the citizens stand their ground and are killed—precisely as happened at the temple of Hermes.[49] For to the citizens, fleeing is shameful and death is more choiceworthy than preserving their life at this cost, while the others were even from the very start facing up to danger on the supposition of being stronger, and when they come to know the truth, they flee, fearing death more than shame. But a courageous person is not like that.

People also count spirit as courage; for those who act because of spirit—like wild beasts that rush at the people who have wounded them—also seem to be courageous, because courageous people are spirited as well; for spirit is most ready to meet dangers. Again, Homer attests to this: "he put strength into his spirit," "rage and spirit he aroused," "bitter rage breathed through his nostrils," and "his blood boiled";[50] for all such expressions seem to signify the arousal of spirit and its impulse.

Courageous people act because of the noble, and spirit is their co-worker. Wild beasts, however, act because of pain; for they act because they have been struck or because they are frightened, since if they are in a forest, at any rate, they do not attack. But it is not courage to rush into danger because of suffering pain or because of being driven on and impelled by spirit while foreseeing none of the terrible outcomes, since that way even hungry asses would be courageous; for they do not stop grazing when they are beaten. Adulterers also do many daring things because of their appetite. But the courage that is caused by spirit seems not to be the most natural sort, and seems to be really courage once deliberate choice and the for-the-sake-of-which are added.

Human beings also suffer pain when they are angered, of course, and take pleasure in revenge. But people who fight because of these, though they may be good fighters, are not courageous; for they do not fight because of the noble or in the way reason prescribes but because of feeling. Still, they have something that is much the same as courage.

Optimistic people, then, are not courageous either; for it is because they have often been victorious and over many opponents that they are confident in facing dangers. But they are similar to courageous people, because both are confident. While courageous people are confident because of what we just mentioned, however, optimistic ones are confident because they think they are the strongest ones and that nothing could happen to them. (Drunks also behave in this sort of way; for they become optimistic.) But when things do not turn out as expected, they flee. But it is characteristic of a courageous person, as we saw, to endure things that are and appear frightening to a human being, because it is noble to do so or shameful not to.

49. In a battle near the city of Coronea in Boeotia in 353 BC.

50. *Iliad* 11.11, 14.151, 16.529; 5.470, 15.232, 594, *Odyssey* 24.318–319. "His blood boiled" is not in our Homer.

That is why it seems to be characteristic of a more courageous person to be fearless and calm in the face of frightening things that are sudden than of those that are clear beforehand, since doing so was more the result of his state of character, because it was less the result of preparation; for when things are evident beforehand we can deliberately choose what to do in accord with rational calculation and reason as well, while when they happen suddenly we must do so in accord with our state of character.

Ignorant people also appear courageous and are not far removed from optimistic ones but are inferior to them insofar as ignorant people have no sense of self-worth, while the others do. That is why optimistic people stand their ground for a time, while if ignorant ones have been deceived, and then recognize or suspect that the situation is other than [they supposed], they flee (which is precisely what happened to the Argives when they fell upon the Spartans taking them for Sicyonians).[51]

We have said, then, what sort of people courageous ones are, as well as the ones that seem to be courageous.

3.9
Courage, Pleasure, and Pain

Although courage is concerned with things that inspire confidence and with frightening things, it is not concerned with both equally but more with frightening ones; for the person who is calm in the face of frightening things, and is in the state one should be in where they are concerned, is courageous more than the person who is so in the face of things that inspire confidence. It is for enduring painful things, then, as we said, that people are called "courageous." That is why courage involves pain, indeed, and is justly praised; for it is more difficult to endure painful things than to abstain from pleasant ones.

Nonetheless, the end that is in accord with courage would seem to be pleasant but to be obscured by the circumstances, as also happens in athletic contests; for to boxers the end for the sake of which they fight is pleasant, the victory crown and the honors. But being struck by blows makes them suffer, if indeed they are made of flesh and blood, and is painful—as too is all their exertion. And because there is a lot of all that, that for the sake of which they fight, because it is small in extent, appears to have nothing pleasant about it.

If the same is also true about courage, death and wounds will be painful to the courageous person, and he will suffer them involuntarily. But he will endure them because it is noble to do so or shameful not to. Indeed, the more he is possessed of virtue in its entirety and the happier he is, the more he will be pained at the prospect of death; for to someone like that living is most worthwhile, and this person will be knowingly depriving himself of the greatest goods, which is a painful thing. He is

51. In a battle at Corinth in 392 BC.

no less courageous because of that, however, but perhaps even more so, because he chooses the noble in war in preference to those goods. It is not true, then, in the case of all the virtues, that it is pleasant to activate them, except insofar as doing so attains the end.

Presumably, there is nothing to prevent the best professional soldiers from being not people like that, but rather the sort who, while less courageous, possess no other good; for these are ready to face dangers and trade their lives for small profits.

So much for courage, then; it is not difficult to get at least an outline of what it is from what has been said.

3.10
Temperance (1)

After this virtue, let us discuss temperance; for courage and temperance seem to be the virtues of the non-rational parts.

We have already said that temperance is a mean concerned with pleasures (for it is less concerned—and not in the same way—with pains). Intemperance also appears in this area. With what sorts of pleasures temperance is concerned, we must now determine.

Let us distinguish, then, between pleasures of the soul and those of the body. Consider, for example, love of honor and love of learning; for in the case of each of these two, a person disposed to love them enjoys them without his body being affected at all, but rather his thought. But people concerned with pleasures like this are called neither "temperate" nor "intemperate." The same holds for those concerned with any of the other non-bodily pleasures; for if people are lovers of stories and inveterate gossipers, spending their days concerned with whatever random things are happening, we call them "idle chatterers," not "intemperate." Nor do we call people
1118a1 "intemperate" if they are pained over matters of wealth or friends.

With pleasures of the body, however, temperance would seem to be concerned—but not with all of these pleasures either; for people who enjoy objects of sight, such as colors, shapes, or a painting, are called neither "temperate" nor "intemperate," and yet it would seem possible, even in these cases, to enjoy them in the way one should or to do so excessively or deficiently. It is the same with the objects of hearing; for no one calls "intemperate" those who enjoy melodies or drama excessively or "temperate" those who enjoy these in the way one should. Nor do we do this where smells are concerned, except coincidentally; for people who enjoy the smells of apples, roses, or incenses are not called "intemperate," but rather the ones who enjoy those of perfumes or gourmet dishes; for intemperate people enjoy these, because through them they are reminded of the objects of their appetites. We also see other people enjoying the smells of food when they are hungry, but to enjoy such things is characteristic of the intemperate person; for in his case, these are the objects of his appetite.

Nor in the case of the other animals is there any pleasure regarding these perceptual modalities, except coincidentally. For what the dogs enjoy is not the smell of a hare but to eat it up, although the smell is what made them perceive it. Nor is the lowing of a cow what a lion enjoys but the cow's meat. The fact that the cow was nearby is something that the lion perceived because of the sound, and thus the lion appears to enjoy the sound. Similarly, what it enjoys is not seeing "a deer or a wild goat,"[52] but making a meal of it.

Temperance and intemperance are concerned with the sorts of pleasures that the rest of the animals share in as well (which is why they appear slavish and beast-like); these pleasures are touch and taste. But they appear to make little or no use even of taste; for the use of taste is to discern flavors, precisely as people do when testing wines, or chefs when preparing gourmet dishes. But discerning such things is scarcely what people enjoy—at any rate, intemperate ones do not. On the contrary, what they enjoy is indulging in them—which enjoyment, whether in eating and drinking or in the so-called pleasures of Aphrodite, comes about wholly through touch. That is why a certain gourmand[53] prayed for his gullet to become longer than a crane's, showing that it was touch that gave him pleasure. Intemperance, then, is related to the most widely shared of the perceptual modalities and so would justly seem to be disgraceful, because it characterizes us not insofar as we are human beings but insofar as we are animals.

To enjoy such things, then, and to like them most, is beast-like. For in fact the pleasures of touch that are most appropriate to free people must be excluded, such as the ones produced in gyms by massaging and heating; for the touching that is characteristic of the intemperate person does not concern the body generally but only certain parts of it.

3.11
Temperance (2)

Some appetites seem to be shared, others to be peculiar to individuals and acquired. For example, the appetite for nourishment is natural; for everyone has an appetite for dry or liquid nourishment, sometimes both, when he is in need of them, and for "bed," as Homer puts it,[54] when he is young and in his prime. But not everyone has an appetite for this or that sort of nourishment or for sex with the same people. That is why such an appetite appears to be peculiarly our own. Nonetheless, it does at least have something natural about it as well; for, though different things are pleasant to different people, there are also some things that everyone finds more pleasant than random ones.

52. Homer, *Iliad* 3.24.
53. *EE* $1231^{a}12$.
54. *Iliad* 24.130–131.

In the case of the natural appetites, few people make errors and only in one direction—that of excess; for to eat or drink random things until we are overfull is to exceed the quantity that is in accord with nature; for a natural appetite is for the replenishment of a need. That is why people who do this are called "gluttons," because they glut their belly beyond what one should. It is the utterly slavish people who turn out like this.

As regards the pleasures peculiar to individuals, however, many people do make errors and in many ways. For people are called "lovers of such-and-such" because they enjoy the sorts of things one shouldn't, or do so more than ordinary people do, or do so not in the way one should. And intemperate people go to excess regarding all these; for they actually enjoy some things one shouldn't (things one should hate, indeed) and if there are some things of the sort in question that one should enjoy, they enjoy them more than one should and more than ordinary people do.

It is clear, then, that intemperance is excess concerning pleasures and is blameworthy. Concerning pains, we are not said to be temperate—as we are said to be courageous—for enduring them, nor intemperate for not doing so. Rather, the intemperate person is so called for being more pained than one should at not getting pleasant things (indeed, the pain too is produced in him by the pleasure), and the temperate one for not being pained at the absence of pleasure or at abstaining from it.

1119[a]1 The intemperate person, then, has an appetite for all pleasant things or for the most pleasant ones, and is led by appetite so as to choose these before the others. That is why he is pained both when he fails to get them and when he has an appetite for them (for appetite involves pain), though it does seem strange to be pained because of pleasure.

People who are deficient concerning pleasures, and who enjoy them less than one should, scarcely occur; for that sort of insensitivity is not human; for even the rest of the animals distinguish among foods and enjoy some but not others. But if there is someone to whom nothing is pleasant, and who does not distinguish between one thing and another, he would be far from being human. This sort of person has not acquired a name, though, because he scarcely ever occurs.

The temperate person, for his part, is in a mean state concerning these matters; for he does not take pleasure in the things the intemperate person most enjoys but is, rather, repelled by them. Neither does he take it in those things generally that one shouldn't nor does he get intense pleasure from anything of that sort nor become pained by its absence. He does not have an appetite for them, or only moderately, and not more than one should, when one shouldn't, or in any of those ways generally. But pleasant things that are conducive to health or a good state, these he will desire moderately and in the way one should, as he will the other pleasant things that do not impede these or are not contrary to the noble or beyond his means. For the person who desires them the other way likes such pleasures more than they merit, while a temperate person is not like that but instead loves them in the way correct reason prescribes.

3.12
Intemperance

Intemperance seems more of a voluntary thing than cowardice does. For it comes about because of pleasure, cowardice because of pain, and of these, pleasure is something choiceworthy, pain something to be avoided. Also, pain utterly alters or destroys the nature of the person who has it, while pleasure does nothing of the sort. Intemperance, then, is a more voluntary thing. That is why it is a more disgraceful one; for it is actually easier to be habituated to pleasures; for many pleasant things occur in our lives, and the circumstances of habituation involve no dangers, while with frightening things it is the reverse.

It would seem, however, that cowardice and the particular actions of cowardice are not voluntary in the same way; for cowardice itself is without pain but the actions cause degeneration because of the pain involved, with the result that people even throw away their weapons and do other unseemly things. That is why the actions seem to be forced.

For the intemperate person it is the reverse. The particular actions seem voluntary (since the agent has the corresponding appetite and desire), while intemperance generally seems less so (for no one has an appetite to be intemperate).

We also apply the name "intemperance" to children's errors, as they have a certain similarity to it. Which is called after which makes no difference for present purposes, **1119b1** although it is clear that the posterior is called after the prior. The transference of the name, in any case, seems not to be a bad one; for something that desires shameful things and has a tendency to grow large must be disciplined, and appetite and child are most like this; for children also live in accord with appetite and it is mostly in them that the desire for pleasure is found.

So if appetite is not obedient and subordinate to the ruling element, it will grow and grow; for the desire for pleasure is insatiable and indiscriminate in the one who lacks understanding, and the activity of appetite causes its congenital tendency to grow, and if the appetites are large and intense, they even knock out rational calculation. That is why they should be moderate and few and not oppose reason in any way (this is the sort of thing we call "obedient" and "disciplined") and just as a child should live in accord with the commands of his tutor, so the appetitive part too should live in accord with reason.

Therefore, the temperate person's appetitive part must be in harmony with reason; for the target of both is the noble, and the temperate person has an appetite for the things one should and in the way and when one should, which is just what reason, for its part, prescribes.

So much, then, for temperance.

BOOK 4

4.1
Generosity

Let us next discuss generosity. It seems to be the mean concerned with wealth; for the generous person is praised not in matters of warfare or in those in which the temperate person is praised or, again, in legal judgments but rather as regards giving or getting wealth—especially the giving of it. By wealth we mean everything whose worth is measured by money.

Wastefulness and ungenerosity are excesses and deficiencies concerning wealth. Ungenerosity, for its part, we ascribe always to those who take wealth more seriously than one should, while in ascribing wastefulness to people we sometimes combine several things; for we call people who lack self-control "wasteful," as we do those who spend on intemperate extravagances. That is why they seem to be the basest of people; for they have many vices at the same time.

The name, then, does not properly belong to them; for by "wasteful" is meant the person who has one vice—that of destroying his substance; for the person who is being destroyed because of himself is wasteful, and the destruction of one's substance seems to be a sort of self-destruction, on the supposition that living depends on it. That, then, is what we take wastefulness to be.

Things that have a use can be used well or badly, and wealth is something that has a use. But the best user of each thing is the one who has the virtue concerned with it. Wealth, then, will also be best used by the person who has the virtue concerned with wealth. And this is the generous person.

Using wealth seems to consist in spending and giving it, while getting it and safeguarding it seem more a matter of possession. That is why it is more characteristic of the generous person to give to the people one should than to get from those one should and not get from those one shouldn't. For it is more characteristic of virtue to act as a benefactor than as a beneficiary and to do noble actions rather than not do shameful ones. And it is clear enough that giving goes along with benefaction and doing noble actions, while getting goes along with being a beneficiary and not acting shamefully.

Also, gratitude goes to the person who gives, not to the one who does not get, and praise goes more to him too. Also, not getting is easier than giving; for people part with what properly belongs to them less readily than they avoid getting what belongs to others. Also, those who give are the ones called "generous," while those who do not get are praised—not for being generous but, if for anything, for justice. And those who do get are not praised at all. Also, of all virtuous people, generous ones are pretty much the most loved; for they are beneficial and their being so lies in their giving.

Actions in accord with virtue are noble and for the sake of the noble. And the generous person will give for the sake of the noble and will do so correctly; for he will give to the people one should, in the amount one should, when one should, and so on for all the other things that go along with correct giving. And he will do it with pleasure or without pain; for what is in accord with virtue is pleasant or without pain, and least of all is it painful.

But the person who gives to the people one shouldn't, or not for the sake of the noble but due to some other cause, will not be called "generous" but something else, and neither will someone who finds giving painful; for he would choose wealth over noble action, and that is not characteristic of the generous person.

Nor will the generous person get from the sources one shouldn't; for that sort of getting is not characteristic of the one who does not pay honor to wealth. Nor will he be fond of asking for favors; for it is not characteristic of the benefactor to readily accept being a beneficiary. But he will get from the sources one should (for example, from his own possessions), regarding this not as noble but as necessary, in order to **1120^{b}1** have something to give. Nor will he neglect his own possessions, because, of course, he wishes to assist others by means of them. Nor will he give to random people, in order that he be able to give to those one should, when one should, and where it is noble to do so.

What is very characteristic of the generous person is even to be excessive in giving, so that he leaves less for himself; for it is characteristic of the generous person not to look out for himself. But it is in accord with wealth that generosity is said; for what is generous lies not in the size of what is given but in the state of the giver and is in accord with the giver's wealth. Nothing prevents a person who gives less from being more generous, then, if he has less from which to give.

Those who have not acquired their wealth themselves but inherited it seem to be more generous; for they have no experience of need. Also, everyone likes his own works more, as parents and poets do. It is not easy, though, for a generous person to be wealthy, because he is neither a getter nor a guarder of wealth, but is lavish with it and pays honor to it not because of itself but for the sake of giving. That is why people complain about luck, saying that those most deserving of wealth are the least wealthy. But it is not unreasonable that this happens; for we cannot have wealth if we do not supervise things in such a way as to have it—just as with everything else.

Nonetheless, the generous person will not give to those one shouldn't, when one shouldn't, and so on; for if he did, he would no longer be acting in accord with generosity, and, if he spent on those things, he would have nothing to spend on the ones one should. In fact, as we said, the one who spends in accord with his wealth and on the things one should is generous, while the one who spends excessively is wasteful. That is why we do not say that tyrants are wasteful; for it does not seem easy for their giving and spending to exceed the size of their possessions.

Because generosity is a mean, then, concerned with the giving and getting of wealth, the generous person will both give and spend on the things one should and

as much as one should, alike in matters small and great, and with pleasure. He will also get from the sources one should and as much as one should. For because the virtue is a mean concerned with both giving and getting, he will do both in the way one should; for giving that is decent goes along with the same sort of getting, and the getting that is not of that sort is contrary to decent giving. The giving and getting that go along with each other, then, are found at the same time in the same person, while those that are contrary to each other clearly aren't.

But if it should happen that a generous person does spend contrary to the way one should and to the correct way, he will be pained—but moderately so and in the way one should; for it is characteristic of virtue to be pleased and pained at the things one should and in the way one should. Also, the generous person is easy to deal with in matters of wealth; for he is susceptible to being treated unjustly, because he does not pay honor to wealth and is more annoyed if he has not spent what one should than he is pained if he has spent what one shouldn't and, in that respect, is not satisfied with Simonides.[55]

The wasteful person, for his part, errs in these matters too; for he is neither pleased nor pained at the things one should or in the way one should. This will become more evident as we proceed.

We have said, then, that wastefulness and ungenerosity are excesses and deficiencies in two things, giving and getting—we will also count spending in with giving. In fact, wastefulness is excessive in giving and not getting but deficient in getting, while ungenerosity is deficient in giving and excessive in getting—but only in small matters.

Certainly the two characteristics of wastefulness are scarcely ever coupled; for it is not easy, while getting from nowhere, to give to everyone; for private individual donors (precisely the people, in fact, who seem to be wasteful) soon outstrip their wealth. And yet this sort of person would seem to be better than the ungenerous person—and not just by a little bit. For he is easily cured, both by age and by poverty and is able to move toward the mean. For he has the characteristics of the generous person; for he both gives and does not get, though he does neither well nor in the way one should. If, then, he were changed in this respect, either through habituation or in some other way, he would be generous; for he will give to the people one should and will not get from the sources one shouldn't. That is why he does not seem to be of base character; for to be excessive in giving and in not getting is characteristic not of a depraved or ill-bred person but of a silly one. But the one who is wasteful in this way does seem much better than the ungenerous person, both because of what we have just said and because he benefits many people, while the ungenerous person benefits no one—not even himself.

However, the majority of wasteful people, as we said, also get from the sources one shouldn't and are, in that respect, ungenerous. They become acquisitive because

55. None of Simonides' surviving poems explains this allusion to him.

they wish to spend but are not readily able to do so, because they soon outstrip their resources. They are compelled, then, to seek provision from elsewhere. At the same time, because they actually think contemptuously of the noble, they also get from any **1121ᵇ1** source regardless; for they have an appetite for giving, but how and from what source they give makes no difference to them.

That is why their acts of giving are not generous, either; for they are not noble, done for the sake of the noble, or in the way they should be. On the contrary, these people sometimes enrich those who should be poor, giving nothing to people of 5 moderate character but a lot to flatterers or people who provide pleasure of some other sort. That is why most of them are intemperate—because they spend readily and on intemperate extravagances, they are prone to expenditures, and because they do not live with an eye to the noble, they incline toward pleasures.

The wasteful person who is left untutored changes in this direction, then, but, 10 with supervision, he could reach the mean and be as one should.

Ungenerosity, however, is both incurable (for old age and any sort of incapacity seem to make people ungenerous) and more natural to human beings than wastefulness; for ordinary people are more disposed to love wealth than to give it away. 15 Ungenerosity is also widespread and of many forms; for there seem to be many ways of being ungenerous. For it consists in two things—deficiency in giving and excess in getting—and so does not come about in its entirety in all cases but sometimes in separate bits, with some people tending to excessive getting, others to deficient giv- 20 ing. For people who are called "misers," "tightfisted," "skinflints," and the like are all deficient in giving, but they do not aim at what belongs to others or wish to get it—in some cases because of some sort of decency and being wary of what is shameful (for there are those who seem to guard their property—at least this is what they say—in order not to be compelled to do anything shameful; these include the cheeseparer, 25 who is so called because of his excessive reluctance to give anything away). But there are also those who because of fear keep their hands off what belongs to others, on the supposition that it is not easy for someone to take another's property without others taking his, so they are satisfied neither to get from others nor to give to them. 30

The other sort, by contrast, are excessive in getting, because they get anything and from any source—those, for example, who work in unfree occupations, such as pimps and everyone of that sort, and loan sharks, who lend small amounts at high interest. For all these people get from sources one shouldn't and in amounts one shouldn't. **1122ᵃ1**

What they apparently have in common is their love of shameful profit; for they all put up with reproach for the sake of profit—and a small profit at that. For those who, on a vast scale, get from sources one shouldn't and get things one shouldn't—such as tyrants who sack cities and plunder temples—are not called "ungenerous," but 5 "wicked," "impious," and "unjust." However a gambler and a robber[56] are included

56. Omitting καὶ ὁ λῃστὴς.

among the ungenerous; for they are lovers of shameful profit. For it is for the sake of profit that both ply their trades and put up with reproach, robbers facing the greatest dangers for the sake of what they can get, gamblers profiting from the friends to whom they should be giving. Both gamblers and robbers, then, are lovers of shameful profit, and so wish to profit from the sources they shouldn't. All such ways of getting, then, are ungenerous. And it makes perfect sense that ungenerosity is said to be the contrary of generosity; for it is a greater evil than wastefulness, and people err more in its direction than with respect to what we have described as wastefulness.

So much, then, for generosity and the vices opposed to it.

4.2
Magnificence

The next thing to discuss indeed would seem to be magnificence. For it too seems to be a virtue concerned with wealth. But unlike generosity, magnificence does not extend to all actions involving wealth but only to those actions concerned with expenditure, and in these, it surpasses generosity in magnitude. For, as the name itself (*megaloprepeia*) signifies, it involves expenditure that is appropriate (*-prepeia*) in its magnitude (*megalo-*). But the magnitude is relative; for it is not the same expenditure that is appropriate to someone equipping a trireme as to someone paying for a religious delegation. What is appropriate, then, is relative to the agent himself, what the action lies in, and what it concerns.

The person who, in matters that are small or moderate, spends in accord with worth—like the one who "gave to many a vagabond"[57]—is not called "magnificent," but someone who does so in great ones is. For the magnificent person is generous, but the generous person is none the more magnificent for that.

The deficiency corresponding to this state is niggardliness, while the excess is lack of refinement, tastelessness, and other things of that sort, which involve being excessive not in the magnitude of spending on the things one should but in being extravagant in circumstances one shouldn't and in ways one shouldn't. We will talk about these matters later.[58]

The magnificent person is like someone with scientific knowledge; for he is able to get a theoretical grasp on what is appropriate and spend great sums in a suitable way. For, as we said at the start,[59] the state is defined by its activities and by its objects. The magnificent person's expenditure is great and appropriate. His works, then, are also like that; for that is the way the expenditures will be great and appropriate to the work. So the work must be worthy of the expenditure and the expenditure of the work—or even exceed it. And the magnificent person will incur such expenditure for the sake

57. Homer, *Odyssey* 17.420.
58. 1123a19–33.
59. 4.2.

of the noble; for this is a feature common to the virtues. Further, he will do it with pleasure and lavishly; for exact accounting is niggardly. And he would investigate how what he accomplishes can be noblest and most appropriate rather than how much it costs or how to do it most cheaply.

It is necessary, then, for the magnificent person to be generous too. For the generous person will also spend as much as one should and in the way one should, and it is in these aspects of expenditure that the greatness (*mega*) of the magnificent (*megaloprepês*) person—as it were, the magnitude (*megethos*)—is found (for generosity concerns the same sorts of expenditures), and from the same expenditure it produces a more magnificent work. For the virtue of a possession and of a work are not the same. For a possession that is worth the most is the most estimable (for example, gold), while the most estimable work is the one that is great and noble (for the contemplation of it is wondrous and the magnificent is something wondrous). Also, the virtue of a work—its magnificence—lies in its magnitude. And this is found in the sorts of expenditure that are called "estimable"—for example, those concerning the gods (votive offerings, ritual objects, and sacrifices). And, similarly, those expenditures concerning everything daimonic, and cases where there is acceptable competition for the honor of furthering the common good—for example, when people think they should fund a chorus extravagantly, equip a trireme, or provide a feast for the city.

In all cases, as we said, expenditure is relative to the agent, both who he is and what resources he has (for the expenditure must be worthy of both), and appropriate not to the work alone but to the person producing it as well. That is why a poor person cannot be magnificent; for he does not have the resources to spend great amounts in an appropriate way. The one who tries to do so is silly; for it is contrary to his worth and to what he should do, while to spend in accord with virtue is to spend correctly. But spending great amounts is appropriate to those who already have such resources through themselves or their ancestors or connections, or to those who are well-bred or reputable or something else of that sort; for all these things involve magnitude and worthiness.

The magnificent person, then, is most of all someone like that, and magnificence is found most of all in these sorts of expenditures, as we said; for these are the greatest and generally most honored. But it is also found in private expenditures of the sort that come about only once, such as a wedding or something else like that, or something (if there is something) that the entire city or the most worthy people in it are eager for—concerned with receiving or sending off foreign guests, say, and giving gifts or receiving them in return; for it is not on himself that the magnificent person spends but on goods that are common, and so his gifts have something of the character of votive offerings. It is also characteristic of a magnificent person to provide himself with a house fitted to his wealth (for it is also an adornment of a sort) and, concerning such things, to prefer to spend on those works that will be long-lasting

(for those are the noblest) and, in each case, to spend what is appropriate (for the same things are not fitting for gods and human beings or for a temple and a tomb).

Also, since each expenditure is great in relation to its kind, the unconditionally most magnificent one is great in relation to a great work. And what is most magnificent here or there is what is great in relation to these or those things, and greatness in the work is different from greatness in the expenditure; for a very noble ball or oil flask has the sort of magnificence characteristic of a child's gift, but its price is not something great or generous. That is why it is characteristic of the magnificent person, in relation to whatever kind of thing he produces, to produce it magnificently (for that sort of thing is not easily surpassed) and in such a way that its worth is in accord with his expenditure.

Such, then, is the magnificent person.

The person who is excessive and unrefined exceeds by spending more than one should, as we said. For in matters of small expenditure, he spends a lot and is improperly extravagant—for example, by giving the members of his dining club a feast appropriate for a wedding, or, when he funds a chorus for a comedy, bringing them onstage dressed in purple, as they do in Megara.[60] And he will produce everything of this sort not for the sake of the noble but to demonstrate his wealth, thinking that he will be wondrous because of it. And where one should spend a lot his expenditure is small, and where one should spend a little it is great.

The niggardly person, on the other hand, will be deficient with regard to everything and, despite having spent the greatest sums, will destroy something noble over a small detail, both hesitating and, whatever he is producing, investigating how to spend as little as possible—both complaining about that and always thinking that he is producing something greater than one should.

These states, then, are vices, but at least they do not incur reproach, because they are neither harmful to a neighbor nor too unseemly.

4.3
Greatness of Soul

Greatness of soul (*megalopsuchia*), even from its name, seems to be concerned with great things (*megala*), and our first task is to grasp what sorts of things these are. And it makes no difference whether we investigate the state or the person who is in accord
1123b1 with it.

The person, then, who thinks himself worthy of great things and is worthy of them seems to be great-souled; for the person who does the same but not in accord with his worth is silly, while no one who is in accord with virtue is silly or lacks understanding. So the one we mentioned is great-souled. For the person who is worthy of

60. Reference unclear.

small things, and thinks himself worthy of them, is temperate but not great-souled; for greatness of soul requires magnitude, just as nobility of appearance requires a large body, while small people are elegant and well proportioned but not noble in appearance.

The person who thinks himself worthy of great things when he is unworthy of them is conceited; but not everyone who thinks himself worthy of greater things is conceited. The person who thinks himself worthy of smaller things than he is worthy of—whether he is worthy of great or moderate things—is small-souled, but also if he is worthy of small ones and thinks himself worthy of ones that are yet smaller. Also, the person who is most small-souled of all would seem to be the one who is worthy of great things; for what would he do if he were not worthy of so much? The great-souled person, then, is extreme in terms of greatness but in a mean in being as one should; for what he thinks himself worthy of is in accord with his worth, while the other people are excessive or deficient.

If, then, he thinks himself worthy of great things and is worthy of them, and most of all so if he is worthy of the greatest things, he would be most concerned with one thing. But worth is said of things in relation to external goods; and we would take the greatest of these to be the one we award to the gods, the one that the most worthy people most aim at, and the one awarded as the prize for the noblest accomplishments. But honor is like that; for it surely is the greatest of external goods. It is with honor and dishonor, then, that the great-souled person is concerned in the way he should be. And it is evident, even without argument, that great-souled people are concerned with honor; for it is most of all honor that the great[61] think themselves worthy of—but in accord with worth. The small-souled person, on the other hand, is deficient both relative to himself and relative to the great-souled person's worth, while the conceited person is excessive relative to himself but not in the least so relative to the great-souled one.

The great-souled person—if indeed he is worthy of the greatest things—would be the best person; for the better person is always worthy of what is greater and the best worthy of what is greatest. Therefore, the truly great-souled person must be good. Indeed, it would seem characteristic of the great-souled person to be great in each virtue. And so it would never be fitting for the great-souled person to flee with his arms pumping like a runner's or to do injustice; for what things will he do shameful actions for the sake of, when to him, at any rate, none of them is something great? And if one investigates particular cases, the great-souled person would appear completely ridiculous if he were not good. Neither would he be worthy of honor if he were base; for honor is a prize of virtue and is awarded to good people. Greatness of soul, then, seems to be like a sort of adornment of the virtues; for it makes the virtues **1124^{a}1** greater and does not come about without them. That is why it is difficult to be truly great-souled; for it is not possible without noble-goodness.[62]

61. Reading οἱ μεγάλοι.
62. *EE* 1249^{a}16–17.

It is with honor and dishonor, then, that the great-souled person is most concerned. And he will be moderately pleased by great honors conferred by excellent people, thinking that he is getting what properly belongs to him—or actually less; for no honor can match the worth of virtue that is complete in every way. Nonetheless, he will accept it at least because they have nothing greater to award him. But honor that comes from random people, or for small accomplishments, he will altogether treat with contempt; for it does not match his worth. It is the same way with dishonor; for it cannot justly attach to him.

It is most of all with honor, then, as we said, that the great-souled person is concerned. Nonetheless, his state concerning wealth and positions of power will be a moderate one—as it will be where good luck or bad luck are concerned (whichever way it turns out to be). So he will not be overjoyed by good luck or overly pained by bad luck. For his state of mind, even concerning honor, is not to think of it as the greatest thing. For positions of power and wealth are choiceworthy because of honor (at any rate, those who have them wish to be honored because of them), and so, to the person for whom even honor is a small thing, these other things will be small as well. That is why great-souled people seem to be arrogant.

It seems that strokes of good luck also contribute to greatness of soul. For the well-bred are worthy of honor, as are those who hold positions of power or who are wealthy; for they are in a superior position and whatever is superior with respect to some good is generally more honored. That is why these things make people more great-souled; for they are honored by some people. In truth, however, only the good person is worthy of honor, although the one who has both [goodness and these other things] is considered more worthy of it. But people who possess these other good things without possessing virtue are not justified in thinking themselves worthy of great things and cannot correctly be called "great-souled"; for without virtue that is complete in every way it is impossible. In fact, people who do possess these other good things are among the ones who become arrogant and wantonly aggressive. For without virtue they cannot easily handle strokes of good luck in a suitable way. And when they cannot handle it and consider themselves superior to other people, they despise them, although their own actions are no better than those of a random person. For they imitate the great-souled person without really being like him, although they imitate him where they can. On the one hand, they do not act in accord with virtue, then, and, on the other, they do despise others. The great-souled person is, indeed, justified in despising others (for his beliefs are true), but ordinary people despise others in a random way.

The great-souled person does not face danger in small matters, nor is he a lover of danger, because there are few things he honors. But he does face great dangers, and, when he does, he is unsparing of his life, on the supposition that it is not worthwhile to live at any price. He is also the sort of person who is a benefactor but is ashamed to be a beneficiary; for the former is characteristic of a superior, the latter of an inferior.

In fact, he reciprocates benefits with bigger ones; for that way the one who started the process will owe him a further debt and be the beneficiary.

Great-souled people also seem to remember the benefits they bestow but not the ones they have received (for the beneficiary is inferior to the benefactor, and the great-souled person wishes to be superior) and are pleased to hear about the former but displeased to hear about the latter. That is why Thetis does not mention to Zeus the benefactions she had provided on his behalf,[63] nor did the Spartans mention theirs to the Athenians, but only the ones they received.[64] It is also characteristic of a great-souled person to ask for nothing or hardly anything but to offer his services eagerly, and to exhibit his greatness to those with a reputation for great worth, or those who are enjoying good luck but to moderate his greatness to those in the middle; for it is a difficult and a dignified thing to show oneself superior to the former but an easy one to do so to the latter and, while adopting a dignified manner toward the former is not ill-bred, to do so toward humble people is unrefined, like displaying strength against the weak. Also, it is characteristic of a great-souled person not to go in for things that are generally honored or for things where others have first place, and to be inactive or delay acting except where there is great honor or a great thing to be accomplished, and to be a doer of few actions but of great and notable ones.

It is necessary too that he be open about his hatreds and loves (for keeping them from being noticed is characteristic of a fearful person, as is neglecting the truth rather than his reputation) and that he speak and act openly (for, because he is someone who despises people, he is a free-speaker and tells the truth except when he is being self-deprecating in the presence of ordinary people). Also, he is incapable of fashioning his way of living to suit another person, unless he be a friend; for to do so would be slave-like (which is why all flatterers are menial and all humble people are flatterers). Nor is he prone to wonder; for to him nothing is great. Nor is he resentful; for it is not characteristic of a great-souled person to dwell on things (least of all bad ones) but to disregard them. Nor is he someone fond of conversation about people; for he will not talk either about himself or about someone else; for he cares neither about winning praise for himself nor about how to get other people blamed.

On the other hand, he is not given to praise, which is why he also does not speak badly of people—even of his enemies, unless because of wanton aggression. As regards things that are necessary or small, he is least likely to complain or ask for help; for to do so is characteristic of someone who takes such things seriously. He is also the sort of person whose possessions are more noble and profitless than profitable and beneficial; for that is more characteristic of a self-sufficient person.

The movements characteristic of the great-souled person seem to be slow, his voice deep, and his speech steady; for the person who takes few things seriously is not the

63. An apparent misremembering of Homer, *Iliad* 1.503–527.

64. Aristotle is apparently referring to a Spartan embassy to Athens in 369 BC to ask for aid against the Thebans.

sort to hurry, nor is someone who thinks that nothing is all that great inclined to be tense. But shrillness of voice and hastiness come about because of these.

So that is what the great-souled person is like. The deficient one is small-souled, the excessive one conceited. People of these sorts do not seem to be bad either (for they are not malicious) but to be in error. For the small-souled person who is worthy of good things will deprive himself of the things he is worthy of and thus does seem to have something bad in him, stemming from his not thinking himself worthy of good things and from being ignorant of himself; for otherwise he would have reached out for the things he was worthy of, which are, of course, good ones. Nonetheless, people like that do not seem to be silly, at least, but to be lacking in self-esteem. Such a belief actually seems to make them worse, though; for each sort of person aims at what is in accord with his worth, but these people avoid even noble actions and pursuits because they think they are unworthy of them, and similarly external goods.

Conceited people, on the other hand, are silly and ignorant of themselves, and obviously so; for they try for things that are generally honored when they are not worthy of them and then are found out. And they adorn themselves with clothes and accessories and things of that sort, and, since they wish the strokes of their good luck to be evident, they talk about it, thinking they will be honored because of it.

Smallness of soul is more opposed to greatness of soul than conceitedness is; for in fact it comes about more often and is worse.

Greatness of soul is concerned with great honor, then, as we said.

4.4
Nameless Virtue Concerned with Honor

1125b1 There also seems to be a sort of virtue concerned with honor, as we said[65] in our first remarks, that would seem to be related to greatness of soul in much the same way as generosity is related to magnificence. For both of these virtues escape greatness, but, concerning moderate and small matters, they dispose us to be the way one should. And just as in getting and giving wealth there is a mean, an excess, and a deficiency, so in the case of honor as well we can desire it more or less than one should or from the sources and in the way one should. For we blame the honor-lover for aiming at honor more than one should or from sources one shouldn't, and we also blame the person who is indifferent to honor for deliberately choosing not to be honored even for noble things. But sometimes we praise the honor-lover as manly and a lover of the noble, and the one who is indifferent to honor as moderate and temperate—as we also said[66] in our first remarks.

65. 1107b24–30.
66. 1109b16–18.

Since we speak in more than one way of loving such-and-such, however, it is clear that we do not always apply "love of honor" to the same thing. Instead, when we are praising, we apply it to loving honor more than ordinary people do; when we are blaming, to loving it more than one should. But since the mean is nameless, the extremes dispute with each other as if it did not exist. Where there is excess and deficiency, however, there is also the mean. And people do desire honor both more and less than one should. There is also the case, then, of those who desire it in the way one should. It is this state, then, that is praised, because it is a mean concerned with honor, although a nameless one. Compared to love of honor, it appears as indifference to honor; compared to indifference to honor, as love of honor; and compared to both, as somehow both.

The same would seem to hold of the other virtues too. But here the extreme people seem opposed to each other because the person in the mean has not been given a name.

4.5
Mild-Manneredness

Mild-manneredness is a mean concerned with anger (the mean is actually nameless, as pretty much are the extremes, so we transfer mild-manneredness to the mean, although it leans toward the deficiency, which is itself actually nameless). The excess might be said to be a sort of irascibility (*orgilotês*), since the feeling here is anger (*orgê*), although the things that produce it are many and various.

The person who gets angry about the things one should, with the people one should, and further, in the way one should and both when and for as long as one should is praised. He, then, would be mild-mannered if indeed mild-manneredness is praised. For being mild-mannered means being calm and not being led by feelings but displaying anger in the way, about the things, and for the length of time that reason prescribes. But it seems to err more toward the deficiency; for the mild-mannered **1126^{a}1** person is not revengeful but considerate to others.

The deficiency, however, whether it is a sort of spiritlessness or whatever, is blamed. For people who are not angry at the things one should be seem silly, as do the ones who are not angry in the way one should, when one should, or with the people one should. Someone like that seems not to be perceptive, or not to feel pain, or—as he is not angry—not to be the sort to defend himself. But for someone to put up with insulting treatment and to stand by watching while this happens to those who are his kin is slavish.

The excess comes about in all these respects (that is, [when one is angry] with the people one shouldn't be, about things one shouldn't be, more than one should be, and more quickly and for a longer time), but at least they are not found in their entirety in the same person. For that would not be possible; for the bad ruins even itself, and if all the parts of it are present, it becomes unbearable.

Irascible people certainly become angry quickly and with people one shouldn't, about things one shouldn't, and more than one should, but they do stop quickly—and this is their best feature. In their case, this comes about because they do not bottle up their anger but retaliate openly, because of the quickness of their spirit, and then stop.

Hypercholeric people are excessively quick-spirited because they are irascible toward everything and on every occasion—hence their name.

Bitter people are difficult to make up with and stay angry for a long time; for they bottle up their anger. But it stops when they retaliate; for taking revenge puts a stop to their anger by producing pleasure in place of the pain. But if that does not come about, they hold a grudge; for because their anger is not open, no one tries to persuade them to give it up, and to digest anger inside ourselves takes time. People like this are the most troublesome to themselves and to their closest friends.

We call "harsh" those who display anger at the things one shouldn't, both more than one should and for a longer time, and who do not become reconciled without taking revenge or exacting punishment.

We regard the excess as more opposed to mild-manneredness; and indeed the excess actually comes about more often; for it is more human to want revenge. Also, harsh people are harder to live with.

But what we said[67] in our previous remarks too is also clear from the present ones; for it is not easy to define in what way, with whom, about what, and for how long one should be angry and up to what point someone is doing so correctly or in error. For the one who deviates a little—whether toward the more or toward the less—is not blamed; sometimes, indeed, we praise those who are deficient in anger and call them "mild-mannered," and sometimes we call those who display anger "manly," on the supposition that they are capable of ruling. How far, then, and in what way someone must deviate to be blameworthy is not easy to give in an account, for it lies in the particulars, and it is in perception that their discernment lies.

But this much is clear at least, that the mean state is praiseworthy, and that it is in accord with the mean state that we are angry with the people one should be, about the things one should be, in the way one should, and so on, while the excesses and the deficiencies are blameworthy—weakly if they are small, more if they are more, and very if they are large. It is clear, then, that we must cling to the mean state.

So much, then, for our discussion of the states concerned with anger.

4.6
Being Ingratiating and Being Disagreeable

In social interaction (that is, living with others and sharing in words and actions) some people seem to be ingratiating. These are people who praise everything in order

67. 1109b14–23.

to give pleasure and are never a hindrance, thinking that they should cause no pain to those they meet. People of the contrary sort, who are a hindrance in everything and think nothing of causing pain, are called "disagreeable" and "quarrelsome."

That the states mentioned are blameworthy, then, is clear enough, as is the fact that the mean state between them is praiseworthy—the one in accord with which we approve of the things one should, in the way one should, and are likewise repelled by them. No name has been given to this state, but it seems most of all like friendship. For this is the sort of person—the one in accord with the mean state—that we tend to call a "decent" friend, once affection is added.

The mean state differs from friendship, however, because it is without feeling and affection for those it relates to; for it is not because of loving or feeling enmity that this person approves of each thing in the way one should but because of the sort of person he is. For he will do so alike concerning those he does not know and those he does know or concerning intimates and non-intimates, except that in each case he will do it in the way that is fitting; for being thoughtful to intimates is not the same as being thoughtful to strangers, nor, again, is causing pain the same in both cases.

Putting it in universal terms, then, we have said that he will relate to others in the way one should and—referring to the noble and to the beneficial—will aim either at not causing pain or contributing to pleasure. For he seems to be concerned with pleasures and pains that come about in social interaction, and in such cases, if it is not noble (or is harmful) to contribute to the pleasure of others, he will be repelled and will deliberately choose to cause pain. And so if someone is doing something unseemly (and not just a little unseemly at that) or something that causes harm, and opposing it will cause little pain, he will not approve but be repelled.

He will relate differently to people of worth and to random ones, and to those more and those less well-known to him, and similarly as regards the other relevant differences, allocating to each group what is appropriate and choosing as an intrinsic good to contribute to pleasure and be wary of causing pain—but in a way that is guided by the consequences (I mean the noble and the advantageous), if these are greater. And for the sake of great pleasure in the future, he will cause small pain now.

That, then, is what the person in a mean is like, although he has not been given a name. Among those who contribute to the pleasure of others, the person who aims at being pleasant, not because of something else, is ingratiating, while the one who does so to get some benefit for himself (in terms of wealth or what comes because of wealth) is a flatterer. As for the person who is repelled by everything, we have said that he is disagreeable and quarrelsome. The extremes appear to be opposed to each other, however, because the mean is nameless.

4.7
Truthfulness

Concerned with pretty much the same things is the mean between boastfulness and self-deprecation, which is also nameless. But it is not a bad idea to go through states of this nameless sort as well; for we will know more about issues relating to character if we have gone through each particular one, and we will be more convinced that the virtues are mean states if we see that this holds in the case of all of them. In regard to living with others, then, those who engage in social interaction with a view to pleasure and pain have been discussed. Now let us discuss those who are true or false in words and actions alike and in their pretensions about themselves.

The boaster, then, seems to be someone who pretends to have reputable qualities that he does not have or to have greater ones than he has, while a self-deprecator seems to be the reverse and to disavow or belittle those qualities he has. The person in a mean, however, seems to be himself, so to speak—truthful in life and word, acknowledging as his the qualities he really has, and neither magnifying nor diminishing them.

It is possible to do each of these things either for the sake of something further or of nothing further. But each sort of person speaks and acts in accord with the sort of person he is and lives that way too, provided he is not acting for the sake of something further. The false, however, is intrinsically base and blameworthy, while the true is intrinsically noble and praiseworthy. Thus the person who is truthful, because he is in a mean, is also praiseworthy, while the two who are false are blameworthy—and boasters more so. But before we speak about these two, we should first speak about the person who is truthful.

For we are not talking about the person who is truthful in his agreements or in matters that contribute to justice or injustice (for these would belong to a different virtue) but about the one who, in situations in which there is nothing of that sort to make a difference, is truthful both in word and life because that is what his state of character is like. And someone like that would seem to be decent. For the lover of truth, because he is truthful even in situations where it makes no difference, will be yet more truthful in those where it does make a difference; for in these cases he will be wary of falsehood as a shameful thing, since he was already wary of it intrinsically. And the person like that is praiseworthy. But he is more inclined toward telling less than the truth; for this appears more suitable, because the extremes are more offensive.

The person who, not for the sake of anything, pretends to more than he has is like someone base (for otherwise he would not enjoy being false) but is more vain and foolish, apparently, than bad. If it is for the sake of something, the one who does it for reputation or honor is not extremely blameworthy, while the one who does it for money or for things that bring money is more unseemly. (It is not due to his capacity that someone is a boaster, however, but due to his deliberate choice; for it is in accord

with his state of character that he is a boaster, and by being that sort of person.) In the same way, someone may be false because he enjoys the falsehood itself or because he desires reputation or profit.

Those who boast for the sake of reputation pretend to be the sorts of things that are praiseworthy or that are thought to make us happy, while those who boast for profit pretend to be the sorts that please their neighbors and that one can avoid being detected for not really being, such as a prophet, a wise person, or a doctor. That is why most boasters pretend to qualities like this; for it is in them that the features mentioned are found.

Because self-deprecators underestimate themselves in what they say, they appear to have more sophisticated characters; for they do not seem to speak for the sake of profit but to avoid pomposity. But it is most of all the reputable qualities that they utterly deny, as indeed Socrates used to do.[68]

Those who disavow small and obvious qualities, however, are called "affected," and are more easily despised—in fact, doing so sometimes appears to be boastfulness, as when people wear Spartan dress; for both the excess and the extreme deficiency are boastful. But people who use self-deprecation in a moderate way, in regard to qualities that are not excessively pedestrian and obvious, appear sophisticated.

It is the boastful person who appears to be opposed to the truthful one; for he is worse [than the self-deprecator].

4.8
Wit

Since life also includes relaxation and the latter includes pastimes that involve amusement, it seems that here too there is a sort of social interaction that is suitable, and sorts of things one should say and ways one should say them, and similarly for listening. It also makes a difference whether we speak in the midst of people of that sort or **1128ª1** listen to people of that sort. And clearly concerning these things there is also excess and deficiency in relation to the mean.

People who go to excess in trying to cause laughter seem to be buffoons and unrefined, doing anything to cause a laugh and aiming at producing laughter rather than at saying things that are gracious and do not cause pain to the butt of their jibing. But those who never say anything to cause laughter themselves, and are repelled by those who do, seem boorish and stiff. People who are amusing in a gracious way, on the other hand, are called "witty" (*eutrapeloi*), as they are quick on the return (*eutropoi*); for things of this sort seem to be movements of people's characters, and just as our bodies are judged from our movements, so are our characters. But since occasions for causing

68. E.g., Plato, *Apology* 20d–e, 21b, *Hippias Major* 286c–d, 304d–e, *Laches* 190b–c, *Lysis* 212a, 223b.

laughter are prevalent, and most people enjoy amusement and jibing more than one should, buffoons are also called "witty," because they are thought sophisticated. But that there is a difference here, and no small one, is clear from what we have said.

Dexterity is also something that properly belongs to the mean state; and it is characteristic of the dexterous person to say and to listen to the sorts of things that are fitting for those who are decent and free; for there are some things that it is appropriate for such a person to say as part of amusement, and also to listen to, and the amusement of the free person differs from that of the slavish one, and that of the well-educated person from that of the uneducated one. We can also see this from old-style and new-style comedies;[69] for in the former what caused laughter was shameful language, while in the latter it is more innuendo, and there is no small difference between these as regards graciousness.

Must the person who jibes well be defined, then, as saying things that are not unsuitable for a free person or that do not cause pain to his listener or even delight him? (Or is that sort of thing in fact indeterminate? For different things are hateful and pleasant to different people.) And he will listen to the same sorts of things; for the sorts he can endure listening to seem to be the sorts that he produces himself.

He will not, then, produce every sort of jibe; for jibes are a sort of abuse, and legislators forbid the abuse of certain things, and presumably should forbid some sorts of jibing as well. The sophisticated and free person, then, will be like that, because he is, as it were, a law for himself. That, then, is what the person in a mean is like, whether he is said to be dexterous or witty.

The buffoon cannot resist what causes laughter—sparing neither himself nor anyone else if he can produce a laugh and saying the sorts of things that the sophisticated person would never say and some he would not even listen to.

1128b1 The boor, on the other hand, is useless in social interaction of this sort; for he contributes nothing and is repelled by everything. But it seems that relaxation and amusement are necessary in life.

The means in life that we have discussed, then, are three, and all of them are concerned with sharing in certain sorts of words and actions. They differ because one is concerned with truth, while the others are concerned with pleasure. Among those concerned with pleasure, one is found in amusements, the other in social interaction in the rest of life.

4.9
Shame

Shame is not fittingly spoken about as a sort of virtue; for it is more like a feeling than a state. Shame is defined, at any rate, as a sort of fear of disrepute, and its effects are much the same as those of the fear of frightening things; for people who are ashamed

69. F167 18.

of themselves blush, and those who fear death turn pale. Both shame and fear appear, then, to be somehow bodily, which seems to be precisely what is characteristic of a feeling rather than a state.

The feeling is fitting not to every age, however, but to the young. For we think that young people should have a sense of shame because they live by their feelings (and so make many errors) but are restrained by shame. Also, we praise those young people who have a sense of shame. But no one would praise an older person for being prone to shame; for we think that he should not do any action that gives rise to shame. For shame is not even something characteristic of decent people, if indeed it arises from base actions (for actions of this sort must not be done; and whether they are truly shameful or reputed so makes no difference; for neither must be done; so a decent person must not feel shame). In fact, shame is characteristic of a base person, who is the sort to do shameful actions. But to be the sort of person who would feel ashamed if he were to do actions like that and then thinks himself to be decent because of it, is strange; for shame is felt toward voluntary actions, and the decent person will never voluntarily do base actions.

But, on the basis of a hypothesis, shame would be decent, in the sense that if someone were to do such actions, he would feel ashamed. But this hypothetical character is not possible where the virtues are concerned. And even if shamelessness is something base, as is not being ashamed of doing shameful actions, it still does not follow that the person who is ashamed of doing these actions is decent.

Self-control is not a virtue either, but a sort of mixed virtue. It will be discussed later.[70] Now let us speak about justice.

BOOK 5

1029^{a}1

5.1
Sorts of Justice

As regards justice and injustice, we must investigate what sorts of actions they are concerned with, what sort of mean state justice is, and what the just is a mean between. And let our investigation be in accord with the same methodical inquiry as our preceding discussions.

We see, then, that what everyone means to say about justice is that it is the sort of state from which people are doers of just things—that is, from which they do just actions and wish for what is just. It is the same way with injustice: it is the state from which people do injustice and wish for what is unjust. That is why the first thing we should do is to assume these things as an outline.

70. 7.1–10.

For it is not the same in the case of both capacities and sciences as it is with states. For the same capacity or science seems to result in contraries, while a state that is contrary to another does not result in contraries—for example, from health we do not do contrary actions, but healthy ones only (for we say that someone is walking in a healthy way when he walks in the way the healthy person would).

A state, then, that is contrary to another is often known from its contrary, and often the states are known from their underlying conditions; for if indeed the good state is evident, the bad one also becomes evident, and the good state becomes evident from what conduces to it, and from it, the things that are conducive to it. For if the good state is firmness of flesh, the bad state must indeed be flabbiness of flesh, and what is conducive to the good state is what is productive of firmness of flesh.

It follows for the most part that if one of a pair [of contraries] is said of things in more than one way, the other is also said of things in more than one way—for example, if just is, unjust is as well.

It seems that justice and injustice are said in more than one way but that the homonymy escapes notice because of their closeness and is less clear than when the ways are further apart (for here there is a big difference in their appearance)—as, for example, when both the clavicle of an animal and the thing we open a door with are said to be keys homonymously.

Let us grasp, then, in how many ways someone is said to be unjust. The unlawful person, then, seems to be unjust, as does the greedy or unfair one, so it is clear that both the lawful and the fair person will be just. Therefore, the just will be what is lawful and what is fair, and the unjust will be what is unlawful and what is unfair.

1129b1 But since the unjust person is greedy, he will be concerned with goods—not with all of them but with those that are matters of good and bad luck, which are always good, unconditionally speaking, but for this or that person, not always so. (These are the ones human beings pray for and pursue. But they should not. Instead, they should pray that unconditionally good things will also be good for them, while choosing the ones that are good for them.)

The unjust person does not always choose too much. Instead, in the case of the unconditionally bad things, he actually chooses too little. But because the lesser evil also seems somehow good and greed is for what is good, he seems to be greedy. In fact, he is unfair; for this term encompasses the two cases and is what they have in common.

But since, as we saw, the unlawful person is unjust and the lawful one just, it is clear that all lawful things are somehow just; for indeed the things defined by legislative science are lawful, and each of these, we say, is just. The laws, for their part, pronounce about all matters, aiming either at the common advantage of all or at that of the best people or of those who—in accord with their virtue or in accord with some other such thing—are in control. So, in one way, the things we call "just" are the ones that produce and safeguard happiness and its parts for the political community.

The law, however, also prescribes that one do the works of a courageous person (for example, not breaking rank or fleeing or throwing down one's weapons), as well as those of a temperate person (for example, not committing adultery or wanton aggression) and those of a mild-mannered one (for example, not striking people or verbally abusing them). It is the same way as regards the other virtues and sorts of depravity, the law orders some things and forbids others—correctly, if established correctly, less well if done so carelessly.

This sort of justice, then, is complete virtue—not unconditionally but in relation to another person. And that is why justice often seems to be the most excellent of the virtues, with the result that "neither the evening star nor the morning star is so wondrous,"[71] and, as the proverb says, "in justice is all virtue summed."[72] And it is complete virtue in the highest degree, because it is the complete use of complete virtue.[73] It is the complete use because the one who possesses it is able to use his virtue in relation to another person and not solely with regard to himself; for many people are able to use their virtue in what properly belongs to themselves but unable to do so in matters relating to another person.

And that is why Bias' saying seems to be well put, that "ruling office reveals the man." For a ruler is already in relation to another person and in a community. It is also because of this very same thing that justice, alone of the virtues, seems to be the good of another, because it is in relation to another person. For it does what is advantageous for someone else, whether ruler or community member.

The worst sort of person, then, is the one who uses his depravity both in relation to himself and in relation to his friends, while the best sort is not the one who uses his virtue in relation to himself but the one who uses it in relation to another person; for that is difficult work.

This sort of justice, then, is not a part of virtue but is virtue as a whole, nor is the injustice contrary to it a part of vice but is vice as a whole.

Besides, the difference between virtue and justice of this sort is clear from what we have said; for they are the same state, but the being [for them] is not the same. Instead, insofar as the state is in relation to another person it is justice, while insofar as it is unconditionally a state of a certain sort, it is virtue.

5.2
Special and General Justice

What we are seeking, however, is the justice that is a part of virtue; for there is one, so we say. And it is the same way as regards the injustice that is a part of vice.

71. Euripides, *Melanippe*, Fr. 486 Nauck.
72. Theognis, ln. 147 Diehl.
73. Reading τῆς τελείας ἀρετῆς χρῆσίς ἐστιν τελεία.

A sign of this is that a person who actively behaves in accord with other sorts of depravity acts unjustly, to be sure, but is not at all greedy—for example, the one who throws down his shield because of cowardice, who engages in verbal abuse because of harshness, or who does not help someone with his wealth because of ungenerosity. On the other hand, when someone is greedy, often his action is not in accord with any of these vices and certainly not with all of them. Yet it is in accord with some sort of wickedness at least, namely, injustice; for we blame it. Therefore, there is another sort of injustice that is a part of the whole, and another way for something to be unjust by being a part of the unjust in the sense of contrary to law.

Further, if one person commits adultery for profit and makes money on it, while another does it—spending and so losing money on it—because of appetite, the latter would seem to be intemperate rather than greedy and the former to be unjust but not intemperate. Therefore, it is clear that this is because the former does it to make a profit.

Further, as regards every other sort of unjust action, its occurrence is always attributed to some particular sort of depravity—for example, if someone has committed adultery, to intemperance; if he broke rank, to cowardice; or, if he struck someone, to anger. But if the action was one of making a profit, it is attributed to no sort of depravity besides injustice.

So it is evident that there is another sort of injustice beyond injustice as a whole that is a part of it. It has the same name, because its definition places it in the same kind; for they both exercise their capacity in relation to another person. The former is concerned with honor, wealth, or preservation (or—if we had one name for it—whatever includes all these) and is due to the pleasure of making a profit, while the latter is concerned with all the things that are the concern of the excellent person.

It is clear, then, that there are several sorts of justice and that there is a distinct sort besides virtue as a whole. What it is and what sort of thing, we must now ascertain.

In the case of the unjust, we distinguished[74] between the unlawful and the unfair, and in the case of the just, between the lawful and the fair. The injustice discussed above is the unlawful sort. Since the unfair and the unlawful are not the same, however, but are distinct, as part from whole (for everything unfair is unlawful but not everything unlawful is unfair), so this unfair sort of the unjust and of injustice are not the same but different from the other sort, the former as parts, the latter as wholes; for this injustice is a part of injustice as a whole, and, similarly, this justice is a part of justice as a whole. So we must also speak about the justice that is a part, about the injustice that is a part, and about the just and the unjust in this way.

We may set aside, then, the justice and injustice that are prescribed in accord with virtue as a whole, since the first is the use of virtue as a whole in relation to another person and the second the use of vice. And it is evident how we must distinguish the just and the unjust in accord with these; for the majority of lawful actions are pretty

74. 1129a32–b1.

much the ones prescribed by virtue as a whole; for the law prescribes living in accord with each virtue and forbids living in accord with each depravity.

What produces virtue as a whole are the conventions ordained by the laws concerned with education that looks to the common good. (Whether the education concerned with a particular individual, on the basis of which he is unconditionally a good man, is a matter for politics or for another science, and is something we must determine later;[75] for being a good man is presumably not in every case the same as being a good citizen.)

One form of the justice that is a part, and of the just in this way, is the one found in the allocations of honor, wealth, or any of the other things that are to be divided among those who share in a constitution (for in the case of these things, it is possible for one person to have a share that is unequal or equal to another's).

Another is rectification in transactions. Of it, there are two parts; for some transactions are voluntary, others involuntary. The voluntary ones are such things as selling, buying, lending with interest, pledging, giving free use of something, depositing, and hiring out (these are called "voluntary" because the starting-point of the transactions is voluntary). Among the involuntary ones, some are clandestine (for example, theft, adultery, poisoning, pimping, enticing away slaves, murder by treachery, and perjury), while others involve force (for example, assault, imprisonment, murder, abduction, disabling, verbal abuse, and insulting treatment).

5.3
Distributive Justice

Since the unjust person is unfair and the unjust is unfair, it is clear that there is also a mean between the unfair extremes. This is what is fair or equal;[76] for in any sort of action in which there is the too much and the too little, there is also what is fair or equal. If, then, the unjust is unfair or unequal, the just is fair or equal—which is precisely what everyone believes even without argument.

Since the fair is a mean, the just would be a mean of some sort. But the fair or equal involves at least two terms. It is necessary, then, for the just to be both a mean and fair or equal, and related to something, and for some people. And insofar as it is a mean, it will be between certain things (and these are the too much and the too little); and insofar as it is fair or equal, it will involve two shares; and insofar as it is just, it will be so for certain people. Therefore, it is necessary for the just to involve at least four terms: those, of course, for whom it is just, which are two, and the things involved (the shares), which are two.

75. $1180^{a}14$–$^{b}28$.

76. A fair share is an equal (*ison*) one, an unfair share an unequal (*anison*) one. "Fair or equal" and "unfair or unequal" are used when this fact is playing a role in the argument.

Also, the fairness or equality will be the same for the people and for the shares involved; for the latter (the shares involved) will stand in the same relation to each other as the people; for if the people are not equal, they will not have equal shares. Indeed, it is from this that quarrels and complaints arise, when either equals get unequal shares (that is, get them in an allocation) or unequals get equal ones.

Further, this is clear from its being in accord with worth; for everyone agrees that the just in allocations should be in accord with some sort of worth. But they are certainly not all speaking about the same sort of worth. Instead, to democrats, worth lies in freedom; to oligarchs, in wealth; to others, in good breeding; and to aristocrats, in virtue.

Therefore, the just is a proportion of some sort. For being proportional is special not to number consisting of units alone but to number in general; for proportion is equality of ratios and involves at least four terms. (That a divided proportion involves four terms is clear enough. But so does a continuous proportion; for it uses one term as two, that is, it mentions it twice—for example, as line A is to line B, so line B is to line C. Line B, then, has been mentioned twice. So if line B is put in twice, the terms in the proportion will be four.)

Also, what is just will involve at least four terms, and the ratio is the same; for the people [A and B] and the shares [C and D] involved are similarly divided. Therefore, as term A is to term B, so term C is to term D; and hence, taking them alternately, as A is to C, so B is to D. So the whole (A + C) will also be so related to the whole (B + D). This is precisely the way the allocation couples them and, if it puts them together that way, couples them justly.

Therefore, the coupling of A with C and that of B with D is the just in allocation. And the just in this way is a mean, while the unjust is contrary to the proportional; for the proportional is a mean and the just is proportional. (Mathematicians call this sort of proportion "geometrical"; for in the geometrical sort, the relation of whole to whole is precisely the relation of each term of a pair to the other term.) But our proportion is not continuous; for there is not a single numerical term for person and share.

The just, then, is this: the proportional. The unjust, on the other hand, is what is contrary to the proportional. Hence one share becomes too much and the other too little, which is precisely what happens in practice; for the person doing the injustice gets too much of what is good, while the one treated unjustly gets too little. In the case of what is bad, it is the reverse; for the lesser evil in the ratio becomes a good in relation to the greater evil (for the lesser evil is more choiceworthy than the greater, what is choiceworthy is a good, and what is more so is a greater good).

This, then, is one form of the just.

5.4
Rectificatory Justice

The remaining one is rectificatory, which is found in transactions, both voluntary and involuntary. And this form of the just is different from the previous one. For the just in an allocation from common funds is always in accord with the proportion mentioned; for if in fact there is going to be an allocation from wealth that is common, it will be in accord with precisely the same ratio as the investments in it have to each other. And the injustice that is opposed to this justice is the one contrary to that proportion.

The just in transactions, on the other hand, is a sort of equality and the unjust a sort of inequality—although one in accord not with the previous proportion but in accord with the arithmetic one. For it makes no difference whether a decent person **1132^{a}1** has defrauded a base person or a base person has defrauded a decent one; or whether it is a decent person who committed adultery or a base one. On the contrary, the law looks only to the difference created by the harm done but treats the people involved as equals, whether one is doing an injustice and the other is suffering it, or one doing a harm and the other suffering it.

So the unjust in this way, since it is a case of inequality, the judge tries to make equal; for even when one person is struck and another does the striking or one actually kills and the other is killed, the suffering and the action constitute unequal parts in a division, and the judge tries to make them equal with respect to the loss by subtracting from the perpetrator's profit.

For when we are describing such cases in simple terms, even if the terms do not properly apply in some of them, we speak of the profit, for example, for the one striking the blow and of the loss for the one suffering it. It is after what was suffered has been measured, at any rate, that the second is called a "loss" and the first a "profit."

So the equal is a mean between the too much and the too little. But the too much and the too little constitute a profit or a loss in contrary ways—too much good or too little bad constitutes a profit and the contrary a loss. A mean here, as we saw, is the equal, and it, we say, is just. So the rectificatory just will be the mean between loss and profit.

That is why too when people are involved in dispute they have recourse to the judge. Going to the judge, however, is going to justice; for the judge wishes to be, as it were, animate justice. Also, they seek the judge as a mean—in fact, some people call judges "mediators," on the supposition that those who can hit the mean are the ones who will hit the just. Therefore, the just is a mean in some way, if indeed the judge is also one.

The judge, however, equalizes things exactly as if they were a line divided into unequal segments and what he had done was subtract from the larger segment the amount by which it exceeded the half-line and added it to the smaller segment. And when the whole has been divided in two, then people say that each has his own share

when he gets what is equal—where the equal is a mean between the too much and the too little that is in accord with the arithmetic proportion.

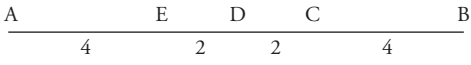
That is why it is called *dikaion* ("just"), because it consists in dividing *dicha* (in two), as if we had said *dichaion* and as if a *dikastês* ("judge") was a *dichastês*. For when a certain amount is subtracted from one of two equal things and added to the other, the second exceeds the first by two times that amount; for if the amount had been subtracted from the one but not added to the other, the second would have exceeded the first by only one times the amount. Therefore, the second was exceeding the mean by one times the amount and the mean was exceeding the thing from which something was subtracted by one times the same amount.[77]

Therefore, this is the way to come to know both what to subtract from the one who has too much and what to add to the one who has too little; for to the one who has too little there must be added the amount by which the mean exceeds it, while the amount by which the mean is itself exceeded must be subtracted from the greatest share. Let the lines AA′, BB′, CC′, and DD′ be equal to each other. From AA′ let AE be subtracted and let CD be added to CC′, so that the whole line DCC′ exceeds EA′ by the segment CD and CF, then AE will exceed BB′ by CD.

{This also holds in the case of the various crafts; for they would have been abolished if the producer had not produced something of both a certain size and a certain quality and if the recipient had not received this and in that size and that quality.}[78]

These names, "loss" and also "profit," are derived from voluntary exchange; for having more than one's own share is called "making a profit," while having less than the one had at the start is called "suffering a loss"—as it is, for example, in buying and selling and other transactions in which the law grants immunity. When neither too much nor too little results, however, but the same as was given, the parties say they have what is their own and are neither suffering a loss nor making a profit. So the just is a mean between a certain sort of profit and loss in matters that are counter to what is voluntary, consisting in having an equal amount both before and after the transaction.

77. AB divided is into two equal segments AD (6 units), DB (6 units). ED (2 units) and DC (2 units) are equal segments of AD and DB.



Aristotle is imagining that ED is subtracted from AD, resulting in AE (4 units) and added to DB, resulting in EB (8 units). EB (8 units) now exceeds AE (4 units) by (2 × 2) units. The mean is 6 units. The share EB (8 units) that is too much exceeds the mean by (1 × 2) units and the mean exceeds the share that is too little, AE (2 units), by (1 × 2) units.

78. Repeated 1133a14–16 where it is secluded.

5.5
Justice in Exchange

It seems to some people, however, that reciprocity too is unconditionally just, as the Pythagoreans used to say;[79] for they defined the just unconditionally as what stands in a reciprocal relation to another. But reciprocity does not fit either the case of the just in an allocation or the case of the just in a rectification. (And yet this, at any rate, is what people wish even Rhadamanthys' line about justice to mean, "If a person suffered what he did, right justice would be done."[80]) For in many ways reciprocity clashes with them. For example, if a ruling officer strikes someone, he should not be struck in return; and if a ruling officer was the person struck, the one who struck him should not only be struck back but punished too. Further, voluntariness and involuntariness make a great difference.

In communities based on exchange, however, what binds the parties together is the just in this way: reciprocity that is proportional and not equal. For it is by proportional reciprocity that a city stays together. For people either seek [to return evil for] evil (and if they do not, it seems like slavery) or [good for] good (and if they do not, no giving in return takes place), and it is by giving in exchange that they stay together. That is why cities erect the temple of the Graces (*Charites*) in a conspicuous place, in order that there might be a return for what is given; for this is the special characteristic of gratitude (*charis*); for we should not only do a service in return for someone who has done us a favor (*ho charisamenos*) but, on another occasion, start by doing a favor too. **1133ª1**

What produces proportional exchange is diagonal coupling. Let A be a builder, B a shoemaker, C a house, and D a shoe. The builder, then, must get from the shoemaker the shoemaker's product and give him his own product in return. If indeed there is first proportional equality, and then reciprocity is achieved, there will be what was mentioned. If not, there is no equality and nothing to keep the parties together; for there is nothing to prevent the product of one of them from being more excellent than that of the other. These products, then, must be equalized. {This also holds in the case of the various crafts. For they would have been abolished if the producer had not produced something of both a certain size and a certain quality and if the recipient had not received this and in that size and that quality.}[81] For it is not from two doctors that a community comes about but from a doctor and a farmer and, in general, from people who are different and not equal. And these must be equalized. That is why everything that is exchanged must be in some way commensurable.

It is for this purpose that money has been introduced and becomes a sort of mean; for, since it measures everything, it also measures excess and deficiency and how

79. See DK 14 (Pythagoras), 44 (Philolaus) = TEGP, pp. 486–515, 47 (Archytas of Tarentum).
80. Hesiod, Fr. 286.
81. Secluded here; read at $1132^{b}9$–11.

many shoes are equal to a house or nourishment. Precisely as builder is to shoemaker, therefore, so must such-and-such number of shoes be to a house or nourishment. For if this does not happen, there will be no exchange and no community. And it will not happen unless the things in question are in some way equal. Therefore, they must all be measured by some one thing, as was said previously. In truth, this one thing is need, which binds everything together; for if people neither needed things nor needed them to a similar extent, either there would be no exchange or not the same [as the existing one]. It is indeed as a sort of exchangeable representative of need that money came into being on the basis of convention and is called "money" (*nomisma*) because of this—because it exists not by nature but by conventional law (*nomos*), and changing it or rendering it useless is up to us.

Reciprocity will exist, then, when equalization has taken place, with the result that precisely as farmer is to shoemaker, so a farmer's product is to a shoemaker's. But we must not introduce them [as terms] in the figure of proportion when they have already made the exchange (otherwise one extreme will have both of the excess amounts) but when they both still have what is their own. That way they will be equals and community members, because this sort of equality can come about in their case: A is a farmer, C nourishment, B a shoemaker, and D his equalized product. But if reciprocity could not be achieved in this way, there would be no community.

That it is need that binds them together—since it is, as it were, one thing—is made clear by the fact that when the parties are not in need of each other—whether mutual or one-sided—they make no exchange, just as when someone needs what one has oneself, for example, when people permit the export of corn in return for wine. Therefore, this proposed exchange must be equalized. And for the sake of future exchange, [even] if we need nothing now, because there could be such need in the future, money is a sort of security for us; for by bringing this we must get [what we need].

The same thing also happens to money, certainly; for it does not always have equal [purchasing] power. Nonetheless, it tends to be more stable. That is why everything must be assigned a price; for that way there will always be exchange, and if we have this, there will be a community. Money, then, acts like a measure that by making things commensurable equalizes them; for there would be no community without exchange, no exchange without equality, and no equality without commensuration either. In truth, to be sure, it is impossible for things so different to become commensurable, but in relation to our needs they can become adequately so.

There must, then, be some single measure, but it will be one based on a hypothesis, which is why it is called "money" (*nomisma*); for money makes everything commensurable; for everything is measured in money. A is a house, B ten minas, C a bed: A is half of B, provided a house is worth five minas, or is equal to them, and the bed C is a tenth part of B. It is clear, therefore, how many beds equal a house—five. And that this is how exchange took place before there was money is clear; for it makes no difference whether it is five beds in return for a house, or the value of five beds.

We have said, then, what the unjust is and what the just is. And with these defined, it is clear that just action is a mean between doing injustice and suffering injustice; for the one involves having too much and the other having too little.

Justice is something in a mean, not in the same way as the other virtues but because it is [productive] of a mean, while injustice is so of the extremes. Also, justice is the state in accord with which the just person is said to do in action what is just, **1134a1** and to do so in accord with his deliberate choice; and to allocate things—whether to himself and another or to two other people—not in such a way that too much of what is choiceworthy goes to himself and too little to his neighbor, and the reverse with what is harmful, but rather the proportionally equal amount to both—and similarly where the allocation is to two other people.

Injustice, on the contrary, is [related in that way to] what is unjust, excess and deficiency of what is beneficial and what is harmful, contrary to what is proportional. Hence injustice is excess and deficiency because it is productive of excess and deficiency. In the case of those involved [in the exchange], this is an excess of what is unconditionally beneficial and a deficiency of what is harmful. In the case of third parties, it is generally the same, but it can be contrary to what is proportional in either of the two directions. In the case of an unjust action, getting too little is what constitutes suffering injustice, while getting too much constitutes doing injustice.

So much for justice and injustice, then, what the nature of each is, and similarly for what, in universal terms, is just and what unjust.

5.6
Political Justice

Since it is possible for someone to do injustice without yet being an unjust person, what sorts of unjust actions make someone who is already unjust, unjust with regard to a particular sort of injustice—for example, a thief, an adulterer, or a pirate? Or is that not at all the way in which actions differ? For someone might in fact have sex with a woman knowing who she is, but not because deliberate choice was the starting-point of his action but because feeling was. He is doing injustice, certainly, but he is not unjust—as, for example, someone is not a thief although he did steal, nor an adulterer although he did commit adultery, and similarly in the other cases.

We have previously said how reciprocity is related to the just. But we must not forget that we are inquiring about both the unconditionally just and the politically just. The latter is found where people share a communal life with a view to self-sufficiency and are free and equal, either proportionally or arithmetically. So those who are not like that have nothing politically just in their relations with each other, only what is just in a way and by a certain similarity. For there is justice only among people whose relations with each other are in fact subject to law, and law only among those where there is injustice. For justice is a judgment of what is just

and what is unjust. Where injustice exists among people, doing injustice also exists among them (although, where doing injustice exists among them, there is not always injustice), and doing injustice consists in allocating to oneself too many of the things that are unconditionally good and too few of those that are unconditionally bad.

That is why it is not a human being we allow to rule but reason, because a human being does so for himself and thus becomes a tyrant. A ruler by contrast is a guardian of what is just and, if of what is just, also of what is equal, since he seems never to get a greater share for himself, if indeed he is just (for he does not allocate a larger share of what is unconditionally good to himself, unless it is proportional to himself—which is why he seems to labor for someone else—and it is because of this that people say that justice is the good of another, as we also said earlier[82]). Therefore, some sort of recompense must be given to him, and this is honor and privilege. And someone to whom such things are not enough, these sorts of people become tyrants.

The just for a master of slaves or for a father is not the same as these other sorts but similar to them; for there is no injustice in relation to what is unconditionally one's own; and one's own possession or child, until it reaches a certain age and has been separated, is like a part of us. No one, however, deliberately chooses to harm himself. That is why there is no injustice in relation to oneself and therefore nothing politically unjust or politically just either; for it, we saw, is what is in accord with law and exists among those who are naturally subject to law, and these people are those to whom equality in ruling and being ruled belong. That is why the just is found more in relation to a wife than in relation to a child or possessions; for this is the just in a household; and it too is different from the politically just.

5.7
Natural Justice and Legal Justice

Of the politically just, one part is natural, the other legal. The natural one is the one that has the same force everywhere and not because it does or does not seem to have it, while the legal is the one where at the start it makes no difference whether it enjoins one thing or another, but once people establish it, it does make a difference—for example, that a mina is the amount of a ransom, or that a goat be sacrificed and not two sheep, and further, all the things about which one passes laws for particular cases (for example, that sacrifices be offered to Brasidas) and things passed by decrees.

It seems to some people that all cases of justice are like this, because what is by nature is unchangeable and has the same capacity everywhere, just as fire burns here and in Persia; while what is just they see as changing. This is not the case, however, but in a way it is. Among the gods, indeed, it is presumably not at all this way, but among us, while there is such a thing as what is by nature, everything is changeable

82. 1130a3.

all the same. Nonetheless, we do find here what is by nature and what is not by nature. But of the things that admit of being otherwise, it is clear what sort are by nature and what sort are not by nature but rather legal and by agreement, if indeed both are similarly changeable. And the same distinction will apply in other cases; for the right hand is by nature stronger, and yet it is possible for everyone to become ambidextrous.[83]

The sorts of things that are just by being in accord with convention and what is advantageous, however, are like measures; for measures for wine and for corn are not the same everywhere but are bigger in wholesale buying and selling and smaller in retail. Similarly too, things that are not naturally just but are human products are also not the same everywhere, since even constitutions are not the same everywhere, although only one is, in accord with nature, best everywhere.[84]

Each of the prescriptions that are just (that is, legal) is like a universal in relation to particulars; for the things that are done in action are many, but each prescription is one thing; for it is a universal. But an unjust action (*adikêma*) and what is unjust are different as are a just action (*dikaiôma*) and what is just; for what is unjust is so by nature or by constitutional arrangement, while the very same thing, when done, is an unjust action, but before it was done, it was not yet an unjust action but rather something unjust. It is the same way with a just action, although here the common sort is more usually called a *dikaiopragêma*, while it is the rectification of an unjust action that is called a *dikaiôma*.

Later we must investigate[85] each of these to see of what sorts their forms are, how many there are, and what they are concerned with.

5.8
Voluntary and Involuntary Justice and Injustice

Given that just and unjust actions are the way we said they are, a person does an unjust action (*adikei*) or a just action (*dikaiopragei*) when he does these voluntarily. But when he does them involuntarily, he does neither an unjust action nor a just action, except coincidentally; for people do in fact do actions that are coincidentally just or unjust.

But an unjust action, and a just action, are defined by the voluntary and involuntary; for it is when the action is voluntary that it is blamed, and it is then, at the same time, also an unjust action. So it is possible for something to be unjust without yet being an unjust action, unless voluntariness is present as well. What I mean by "voluntary," as was also said earlier,[86] is what is up to oneself and done knowingly—

83. †*MM* $1194^{b}33$–39.
84. *Pol.* $1293^{b}3$–7.
85. Perhaps a reference to a lost book of the *Politics* dealing with laws, or to *Rh.* 1.13–14.
86. $1111^{a}3$–19.

that is, not in ignorance of whom, with what, or for what's sake (for example, whom one is striking, with what, and for the sake of what), and where each of these is neither coincidentally so nor so by force. For example, if someone were to take the hand of another person and use it to strike a third, the second would not be acting voluntarily; for it was not up to him. It is also possible that the one being struck is his father, while the agent, while knowing that he is striking a human being or one of the people present, does not know that it is his father. Similar distinctions must also be made in the case of the for-the-sake-of-which and concerning the action as a whole.

What is done in ignorance, then, or not in ignorance but not up to the agent, or what is done by force, is involuntary. For there are in fact many natural processes that we either do or undergo knowingly, none of which are either voluntary or involuntary—for example, aging or dying.

Both unjust actions and just actions alike can also be coincidentally such; for in fact someone might return a deposit involuntarily and because of fear, and someone like that must not be said either to be doing what is just or to be doing a just action, except coincidentally. Similarly, one must also say that the person who fails to return a deposit, because he is under compulsion and acting involuntarily, is only coincidentally doing what is unjust or doing an unjust action. Among our voluntary actions, we do some having deliberately chosen them (the ones where there is prior deliberation), while we do others not having deliberately chosen them (the ones where there is no prior deliberation).

There are three sorts of harm, then, that are found in communities. Those involving ignorance are errors when the one affected by the action, what he is doing, the instrument, or the end is not as the agent thought; for he thought either that he was not hitting, or not with this, or not this person, or not for the sake of this, but, instead, the for-the-sake-of-which happened not to be as he thought (for example, he hit not in order to wound but in order to provoke) or not the person he thought or not with the instrument he thought.

When the harm is contrary to reasonable expectation, then, it is a stroke of bad luck. By contrast, when it is not contrary to reasonable expectation but involves no vice, it is an error (for someone commits an error when the starting-point of its cause is in himself, but it is a stroke of bad luck when the starting-point is outside him).

When an agent harms knowingly but without prior deliberation, it is an unjust action—for example, acts done because of spirit or other feelings that are necessary and natural to human beings; for people who do these sorts of harms and commit these sorts of errors are doing what is unjust, and their actions are unjust actions; however, they are not yet unjust or wicked because of this; for the harm was not done because of depravity. But when it is done as a result of deliberate choice, the agent is unjust and depraved.

That is why acts done as a result of spirit are correctly judged not to be premeditated; for their starting-point is not the agent who acts as a result of spirit but the one who made him angry. Further, the dispute is not about whether the event took place

or not but about what is just; for the anger is at an apparent injustice. For the parties are not disputing about whether the event took place or not, as in transactions, where—unless they are doing it because of forgetfulness—one of the parties must be depraved. Instead, the parties agree about the thing at issue, but dispute about whether the action was just or not (while the person who deliberately harms another is not ignorant about this), so that one party thinks he has been done an injustice, while the other denies it.

If a person harms as a result of deliberate choice, however, he acts unjustly, and it **1136ᵃ1** is already by doing these unjust actions that the unjust person is unjust, when they are contrary to what is proportional or to what is equal. Similarly, a person is just when he does just actions as a result of deliberate choice, while he does a just action if he merely does it voluntarily.

Some involuntary actions merit sympathetic consideration, while others do not merit sympathetic consideration. Errors that people make not only in ignorance but also because of ignorance merit sympathetic consideration, while when errors are made not because of ignorance but in ignorance caused by a feeling that is neither natural nor human, they do not merit sympathetic consideration.

5.9
Puzzles about Doing and Suffering Unjust Actions

Someone might raise some puzzles, however, about whether we have adequately defined what suffering an unjust action is and what doing an unjust action is. He might ask, first of all, whether things are as Euripides suggests in the strange lines:

> I killed my own mother: short the tale.
> A voluntary thing on both parts or an involuntary one?[87]

For is it really possible to suffer an unjust action voluntarily? Or is it impossible and, instead, always involuntary, just as doing an unjust action is always voluntary? And is it always one or the other or is it sometimes voluntary and sometimes involuntary?

It is the same way in the case of suffering a just action; for doing a just action is always voluntary, so that it is reasonable for there to be a similar opposition in either case and for suffering an unjust action and suffering a just action to be either something voluntary or something involuntary. But it would seem strange, even in the case of suffering a just action, if it were always voluntary; for some people suffer a just action involuntarily.

Next, we might also go through the following puzzle about whether every person who has suffered something unjust has suffered an unjust action or whether the case

87. From the lost *Alcmaeon* (referred to 1110ᵃ27–29), Fr. 68 Nauck. The first line is spoken by Alcmaeon, the second possibly by Phegeus.

of suffering one is just like the case of doing one; for it is possible to share coincidentally in what is just in both directions, and similarly, it is clear, in the case of what is unjust; for doing something that is unjust is not the same as doing an unjust action, nor is suffering something unjust the same as suffering an unjust action. It is the same way in the case of doing a just action and suffering a just action; for it is not possible to suffer an unjust action without someone's doing an unjust action or to suffer a just action without someone's doing a just action.

But if to do what is unconditionally an unjust action is to harm someone voluntarily; and if "voluntarily" means for someone to know the one affected, the instrument, and the way; and if the person who lacks self-control harms himself voluntarily; then he would voluntarily suffer an unjust action and it would be possible for someone to do an unjust action to himself. This is also one of the puzzles that are raised, whether it is possible for someone to do an unjust action to himself. Further, someone could, because of lack of self-control, be voluntarily harmed by someone else who was acting voluntarily, so that it would be possible to suffer an unjust action voluntarily.

Or is our definition incorrect, and to harming while knowing the one affected, the instrument, and the way, must we add against the wish of the one affected? Then someone is harmed and suffers unjust things voluntarily, but no one suffers an unjust action voluntarily; for no one wishes to suffer such an action, not even the person who lacks self-control, who instead acts contrary to his wish; for no one wishes for what he does not think to be excellent, and the person who lacks self-control does not do what he thinks he should do.

The person who gives away what is his own, as Homer says Glaucus gave to Diomedes "gold for bronze, a hundred oxen's worth for nine,"[88] is not suffering an unjust action. For to give is up to himself. To suffer an unjust action, however, is not up to himself; on the contrary, the person doing injustice must be present. As regards suffering an unjust action, then, it is clear that it is not voluntary.

Further, of the issues we deliberately chose to discuss, two remain, whether the person doing the unjust action is the one who allocates a larger share to someone contrary to his worth or is the one who has the larger share, and whether it is possible to do an unjust action to oneself. For if the first alternative is possible and it is the allocator who does the unjust action and not the one who has the larger share, then if someone knowingly and voluntarily allocates a larger share to someone else than he does to himself, this person does an unjust action to himself, which is precisely what moderate people seem to do; for the decent person tends to take less than his share. Or is it not that simple? For it may be that the decent person is getting a larger share of a different good—for example, of reputation or of what is unconditionally noble. Further, [the puzzle] is resolved by appeal to our definition of what it is to do an

88. Homer, *Iliad* 6.236.

unjust action.[89] For he suffers nothing contrary to his own wish, so that on these grounds at least he suffers no unjust action. Rather, if indeed he suffers anything, it is harm alone.

It is evident that the allocator of the larger share does in fact do an unjust action but that the person who has the larger share does not always do one; for it is not the person to whom the unjust share belongs who does the unjust action but the one who voluntarily does the unjust action, the one from whom, as the starting-point of the action, it derives, and the starting-point is in the allocator, not in the recipient.

Further, since *do* is said of things in many ways, and there is a way in which inanimate things do kill, and a hand and a servant under orders, though they do not do an unjust action, they do what is unjust.

Further, if the allocator gave his judgment in ignorance, he does not do an unjust action, according to the legally just, nor is his judgment unjust, although in a way it is unjust (for what is legally just is different from what is just in the primary way). However, if he knowingly gives an unjust judgment, he himself is getting more than his share either of favor or of revenge. The person, then, who has given an unjust judgment because of these things has also got more than his share, exactly as if he had gotten part of the proceeds of an unjust action. And in fact, having given the judgment about land on that condition, he got not land but money.

Human beings think that doing unjust actions is up to them. That is why they also think that the just is easy. But it isn't. Having sex with a neighbor's wife, striking someone standing nearby, or putting money in someone's hand is easy and is up to themselves. But doing them because of being in a certain state is not easy and not up to themselves.

In the same way people think that to know what is just and what is unjust we need not be at all wise, because the things the law pronounces about are not difficult to comprehend (but these do not constitute what is just except coincidentally). But knowing the way actions must be done and things must be allocated if they are to be just—that takes more work than knowing what things are healthy, since even in their case, while knowing that honey, wine, hellebore, cautery, and surgery are healthy things is easy, knowing the way these must be allocated with a view to health and to whom and when takes as much work as being a doctor.

Because of this very thing, they also think that to do unjust actions is no less characteristic of the just person than to do just ones, because the just person is no less—but even more—able to do each of these actions; for he too is able to have sex with a woman and strike blows, and the courageous person is able to throw down his shield and turn and run in this direction or that. But doing cowardly actions or unjust actions is not doing things of this sort except coincidentally; on the contrary, it involves being in a certain state when we do them. In the same way, doing medical

89. $1136^{b}3$–5.

actions or curing someone does not consist in performing a surgery or not performing one; or giving drugs or not giving them; but in doing them in a certain way.

What is just is found among people who have a share in unconditionally good things, who can have an excess of these or a deficiency; for, for some beings (as presumably for gods) there is no such thing as an excess of them, while for others (the incurably bad ones) no amount of them is beneficial but they are all harmful, and for yet others, they are beneficial up to a point. That is why the just is something human.

5.10
Decency

We must next say something about decency and the decent—about the way decency is related to justice and the way the decent is related to the just. For on investigation these appear to be neither unconditionally the same nor distinct in kind. Sometimes indeed we praise the decent and a man of this sort, so that we even transfer decent **1137b1** to other things we are praising in place of good, making it clear that the more decent is better. But sometimes, on following out the argument, it appears strange that the decent, if it is something beyond the just, must be something praiseworthy; for either the just is not something excellent or the decent is not just, if it is different from the just; or, if both are excellent, they are the same.

It is pretty much because of these considerations, then, that a puzzle arises about the decent. Yet in a way they are all correct and none is contrary to any of the others; for the decent, although better than what is in a certain way just, is still just and is not better than the just in the sense of being a thing of a distinct kind. After all, the same thing is just and decent, and while both are excellent, the decent is more excellent.

What produces the puzzle is that while the decent is just, it is not the just according to the law, but rather a rectification of the legally just. The cause of this is that all law is universal, but about some sorts of things it is not possible to pronounce correctly in universal terms. So in the sorts of cases where it is necessary to speak in universal terms but not possible to do so correctly, the law picks what holds for the most part, not unaware of the error involved. And it is no less correct for doing so; for the error is not in the law or in the legislator but in the nature of the thing at issue; for what is doable in action consists of this sort of subject matter from the outset. So whenever the law speaks universally and a particular case arises that is contrary to the universal, at that time it is correct (insofar as the legislator omits something and has made an error in pronouncing unconditionally) to rectify the deficiency—to say what the legislator himself would have said had he been present and would have ordained by law had he known about the case.

That is why the decent is just and better than what is in a certain way just. It is not better than the unconditionally just, however, but only better than the sort that, because it pronounces unconditionally, makes an error. And this is the very nature of the decent—a rectification of law insofar as it is deficient because of its universality.

For this is also the cause of not everything's being regulated by law, that there are some cases where it is impossible to establish a law, so that decrees are needed. For the standard of what is indeterminate is itself indeterminate, just like the lead standard[90] used in Lesbian-style building; for the standard is not fixed but adapts itself to the shape of the stone, and a decree adapts itself to the things.

What it is to be decent, then, and that it is both just and better than what is in a certain way just is clear. And it is also evident from this what the decent person is; for the person who is disposed to deliberately choose and to do these sorts of actions, and is not a stickler for justice in the bad way but takes less than his due even if he has the law on his side, is decent and his state is decency, which is a sort of justice and not some different state.

5.11
Doing Injustice to Oneself

Whether it is possible to do an unjust action to oneself or not is evident from what has been said.[91] For some just actions are the ones in accord with any virtue that are required by law—for example, the law does not allow the killing of oneself, and the things it does not allow, it forbids. Further, whenever, contrary to the law, someone harms another person, not in return for a harm, and does so voluntarily, he does an unjust action (and the one who does it voluntarily is the one who does it knowing the person affected and the instrument used). But the person who, because of anger, kills himself does this voluntarily, contrary to correct reason, and this the law does not allow. Therefore, he does an unjust action. But to whom? Or is it to the city, and not to himself? For he suffers it voluntarily, and no one suffers an unjust action voluntarily. That is why indeed the city imposes a penalty and why a certain dishonor attaches to a person who has done away with himself, on the supposition that he is doing something unjust to the city.

Further, insofar as the unjust agent is only unjust and not wholly base, it is not possible for him to do an unjust action to himself. (For this is different from the former case; for the person who is unjust in this way is wicked in the same way as a coward, not by possessing wickedness as a whole, and so it is also not in accord with it that he does the unjust action.) For that would be for the same thing to have been taken away from and added to the same person at the same time, and this is impossible. Rather, when something is just or when something is unjust, there must always be more than one person involved.

Further, an unjust action is voluntary, done from deliberate choice, and initiatory. For the person who acts because of something he suffered, and who does the same

90. Apparently a flexible lead device used to find a match for an irregularly shaped stone that was already set in position.

91. Presumably 1136^{a}10–1137^{a}1.

back, does not seem to do an unjust action. If he does it to himself, however, he is suffering and doing the same thing at the same time.

Further, it would be possible to suffer an unjust action voluntarily.

Besides, no one does an unjust action without doing one of the particular sorts of unjust action, and no one commits adultery with his own wife or breaks into his own house or steals his own property.

The puzzle about doing an unjust action to oneself is generally resolved, however, by reference to our definition[92] concerned with suffering an unjust action voluntarily.

It is evident too that both the doing of the unjust action and the suffering of the unjust action are base (for the second involves having less and the first having more than the mean, which is like health in the case of medicine, or good physical condition in that of athletic training). Nonetheless, the doing of the unjust action is worse; for doing an unjust action involves vice and is blameworthy, and the vice is either complete and unconditional or close to it (since not every voluntary unjust action involves injustice), while suffering an unjust action involves neither vice nor injustice. Intrinsically, then, suffering an unjust action is less base, but coincidentally there is nothing to prevent it from being a greater evil. But what happens coincidentally is of no concern to craft. Rather, it says that pleurisy is a worse malady than a stumble, and yet the latter might turn out to be coincidentally worse (if the stumbler, because of his fall, was captured or killed by his enemies).

By transference, though, and by similarity, what is just is found not in a person's relations to himself but among some of his parts—not what is just in every way but what is just in the way found in the mastery of slaves or in household management. For in these accounts the part of the soul that has reason is distinguished from the non-rational part. People look at these, indeed, and it seems to them that just actions can occur in a person's relations to himself, because it is possible for each of the parts to suffer things that are contrary to its own desires. So there is, then, something just in their relations with each other, like that between ruler and ruled.

As regards justice, then, and the others—the virtues of character—let them be defined in the foregoing way.

BOOK 6

6.1
Correct Reason and the Virtues of Thought

Since we have previously said that one must choose the mean, not the excess and not the deficiency, and the mean is as correct reason says, let us distinguish this. For in the case of all the states we have discussed, and as regards the others as well, there is

92. 1136b3–5, 23–25.

some target on which a possessor of the reason keeps his eye as he tightens or loosens, and there is some sort of defining mark of the mean states, which we say are between excess and deficiency, being in accord with correct reason.

But though this is true to say, it is not at all perspicuous; for even in the other sorts of supervision where there is scientific knowledge, it is true to say that one should exert oneself or relax neither too much nor too little but to a mean degree and as correct reason says. But someone having only this [account] would know nothing more, for example, as to what sorts of treatments to apply to the body, than if someone were to say that one should apply those that the craft of medicine prescribes and in the way the one who possesses this craft would. That is why, with regard to the states of the soul as well, we should not only assert this much of the truth but also determine what correct reason is and what its defining mark is.

In distinguishing the virtues of the soul we said[93] that some are virtues of character and some of thought. The virtues of character, to be sure, we have discussed. So let **1139ª1** us now speak about the others as follows, after first saying something about the soul. Previously, then, we said[94] that there are two parts of the soul, both one that has reason and one that lacks reason. Let us now divide in the same way the part that has reason. Let it also be assumed that there are two parts that have reason—one by which we get a theoretical grasp on those beings whose starting-points do not admit of being otherwise and one by which we do so on those that do admit of being otherwise; for where beings are distinct in kind, parts of the soul that are distinct in kind are naturally suited to each of them, if indeed it is on the basis of a certain similarity and kinship that they have knowledge.

Let us call one of these "the scientific part" and the other "the rationally calculative part"; for deliberating is the same as rationally calculating, and no one deliberates about what does not admit of being otherwise. So the rationally calculative part is one distinct part of the part that has reason.

Therefore, we must grasp what the best state of each of these parts is; for this is the virtue of each of them and the virtue relates to the proper work.

6.2
Action, Truth, and Deliberate Choice

Three things in the soul, indeed, control action and truth—perception, understanding, and desire. Of these, perception is not a starting-point of any action. This is clear from the fact that wild beasts have perception but do not share in action.

What affirmation and denial are in the case of thought, that, in the case of desire, is precisely what pursuit and avoidance are. So, since virtue of character is a

93. $1103^{a}3$–10.
94. $1102^{b}13$–$1103^{a}3$.

deliberately choosing state and deliberate choice is deliberative desire, it follows that both the reason must be true and the desire must be correct, if indeed the deliberate choice is to be an excellent one, and the very things the one must assert, the other must pursue. This, then, is practical thought and truth. In the case of thought that is theoretical, however, and neither practical nor productive, the good state and the bad state are truth and falsity (for that is the work of every part involving thought) but in the case of the part involving practical thought, the good state is truth in agreement with correct desire.

Of action, then, the starting-point—the source of the movement, not what it is for the sake of—is deliberate choice, and of deliberate choice, the starting-point is desire and reason that is for the sake of something. That is why, without understanding and thought, on the one hand, and a state of character, on the other, there is no deliberate choice; for there is no doing well in action or its contrary without thought and character. Thought by itself, however, moves nothing, but thought that is for the sake of something and practical does; for this even rules productive thought; **1139b1** for every producer produces for the sake of something, and what is producible is not unconditionally an end (as opposed to an end in relation to something and for something else) but what is doable in action is; for doing well in action is the end, and the desire is for it. That is why deliberate choice is either desiderative understanding or thought-involving desire, and this sort of starting-point is a human being.

Nothing in the past is an object of deliberate choice—for example, nobody deliberately chooses to have sacked Troy; for nobody deliberates about the past either, but rather about what is to happen in the future and what admits of being otherwise, and what is past does not admit of not having happened. That is why Agathon is correct:

> Of one thing alone is even a god deprived,
> To make undone what is done and finished.[95]

Of both of the parts that involve understanding, then, the work is truth. So the states in accord with which each most grasps the truth are, in each of the two cases, their virtues.

6.3
Scientific Knowledge

Let us start, then, from further back and speak again about these issues. Let the states, then, in which the soul grasps the truth by way of affirmation and denial be five in number: craft knowledge, scientific knowledge, practical wisdom, theoretical wisdom, and understanding; for supposition and belief admit of falsehood.

95. Fr. 5 Nauck.

What scientific knowledge is will be evident from the following, if one is to speak in an exact way and not be guided by mere similarities. For we all suppose that what we know scientifically does not at all admit of being otherwise, while in the case of things that do admit of being otherwise, whenever they fall outside our observation it escapes notice whether they hold or not. Therefore, what admits of being known scientifically is by necessity. Therefore, it is eternal; for the things that are unconditionally necessary are all eternal, and eternal things cannot come to be or pass away.

Further, each and every science seems to be teachable, and what can be known scientifically to be learnable. And it is from things already known that all teaching proceeds, just as we also say in the *Analytics*;[96] for some is through induction and some by deduction. Induction is clearly a starting-point of the universal as well, while a deduction proceeds from universals. Therefore, there are starting-points from which a deduction proceeds that are not reached by deduction. Therefore, induction [must provide them].

Therefore, scientific knowledge is a state affording demonstrations and has the other features included in the definition we give in the *Analytics*; for it is when someone is convinced in a certain way[97] and the starting-points are known to him that he has scientific knowledge; for if they are not better known than the conclusion, it is in a coincidental sense that he will have scientific knowledge.

Let scientific knowledge, then, be defined in this way.

6.4
Craft Knowledge

What admits of being otherwise includes both what is producible and what is doable in action. But production and action are different (about them we rely also on the external accounts), so that the practical state involving reason is also different from the productive state involving reason. And nor[98] is one encompassed by the other; for action is not production and production is not action. Since, then, building, for example, is one sort of craft and is precisely a productive state involving reason, and since there is no craft that is not a productive state involving reason and no such state that is not a craft, a craft would be actually the same as a productive state involving true reason. **1140^{a}1**

Every craft is concerned with coming to be, that is, with crafting things and getting a theoretical grasp on how something may come to be that admits of being and of not being and whose starting-point is in the producer but not in the product; for things that are or come to be by necessity are not the concern of craft, nor are things that are in accord with nature (for they have their starting-point within themselves).

96. *APo*. 71^{a}1–8.
97. *APo*. 72^{a}37–^{b}4, *Top*. 134^{a}34–35.
98. Reading καὶ.

Since, then, production and action are different, it is necessary that craft be concerned with production but not with action.

And in a certain way, craft and luck are concerned with the same things; as Agathon says, "Craft loves luck and luck craft."[99]

A craft, then, as we said, is some sort of state involving true reason concerned with production, and craft incompetence is the contrary, a state involving false reason concerned with production. Both are concerned with what admits of being otherwise.

6.5
Practical Wisdom

As regards practical wisdom, we might grasp it by observing what sort of people we say are practically wise. It seems, then, to be characteristic of a practically wise person to be able to deliberate correctly about what is good and advantageous for himself, not with respect to a particular area (for example, about what sorts of things further health or further strength) but about what sorts of things further living well as a whole. A sign of this is that we also speak of people as practically wise in some area, when they rationally calculate well about what furthers some excellent end, concerning which no craft exists. So in the case of the whole too it is the deliberative person who will be practically wise.

Also, nobody deliberates about things that cannot be otherwise or about things that cannot be done in action by himself. So, if indeed scientific knowledge involves demonstration, and the things whose starting-points admit of being otherwise cannot be demonstrated (for all of them also admit of being otherwise) and it is not possible to deliberate about what holds by necessity, practical wisdom cannot be either scientific knowledge or craft knowledge—not scientific knowledge because what is doable in action admits of being otherwise, not craft knowledge because action and production are distinct in kind. Therefore, the remaining possibility is for practical wisdom to be a true state involving reason, a practical one, concerned with what is good or bad for a human being. For the end of production is something other than production, while that of action is not something other than action; for doing well in action is itself action's end.

That is why we think Pericles and people of that sort to be practically wise—because they are capable of getting a theoretical grasp on what is good for themselves and for human beings, and we regard household managers and politicians to be of this sort.

That is also why we call temperance (*sôphrosunê*) by this name, as being what preserves practical wisdom (*sôzousan tên phronêsin*). And it does preserve this sort of supposition. For the pleasant and painful do not destroy or distort every sort of

99. Fr. 6 Nauck.

supposition (for example, that triangles do or do not contain two right angles) but the ones about what is doable in action. For the starting-points of things doable in action are the [end] that the things doable in action are done for the sake of. But once someone is destroyed by pleasure or pain, to him this does not appear a starting-point or that it is for the sake of it and because of it that one should choose and do everything; for vice is destructive of the starting-point. So it is necessary for practical wisdom to be a true practical state involving reason, concerned with human goods.

Of craft knowledge there is certainly a virtue, while of practical wisdom there is not one. And, in the case of a craft, the person who makes errors voluntarily is preferable, while in the case of practical wisdom it is not so, as is also the case with the virtues. It is clear, then, that it is some sort of virtue and not a craft.

Since there are two parts of the soul that have reason, however, it would be a virtue of one of them, the part that forms beliefs; for both belief and practical wisdom are concerned with what admits of being otherwise.

But surely it is not a state involving reason only. A sign of this is that there is forgetfulness of a state like that, but of practical wisdom there is not.

6.6
Understanding

Since scientific knowledge is supposition about universals and things that are by necessity, and since there are starting-points of what can be demonstrated, and so in all sciences (for scientific knowledge involves reason), about the starting-point of what is scientifically knowable there can be neither scientific knowledge nor craft knowledge nor practical wisdom; for what is scientifically knowable is demonstrable, while the other two deal with what admits of being otherwise.

Nor, then, is there theoretical wisdom of these; for it is characteristic of the theoretically wise person to have a demonstration of certain things. **1141^{a}1**

If, then, the states by which we grasp the truth and never have false views about what cannot—or even can—be otherwise are scientific knowledge, practical wisdom, theoretical wisdom, and understanding, and it cannot be any of the three of these (by "the three" I mean practical wisdom, scientific knowledge, and theoretical wisdom), the remaining alternative is for understanding to be of starting-points.

6.7
Theoretical Wisdom and Practical Wisdom

Wisdom in crafts we ascribe to the most exact practitioners of their crafts (for example, calling Phidias "a wise sculptor in stone" and Polyclitus "a wise sculptor in bronze"), here signifying nothing else by wisdom, indeed, than that it is a virtue of

craft knowledge. There are, however, some people we think are wise about things as a whole, not wise in some area or wise in some other particular way, as Homer says in the *Margites*:

> him the gods made neither a digger nor a plowman
> nor wise in any other particular way.

So it is clear that theoretical wisdom must be the most exact of the sciences.[100]

Therefore, the theoretically wise person must not only know what follows from the starting-points but must also grasp the truth concerning the starting-points. So theoretical wisdom would be understanding plus scientific knowledge—scientific knowledge, having a head, as it were, of the most estimable things. For it would be strange if someone thinks that politics or practical wisdom is most excellent, unless the best thing in the universe is a human being.

If, then, what is healthy and good is different for human beings and fish, while what is white and straight is always the same, everyone would say that what is theoretically wise is the same but that what is practically wise is different; for the one who has a theoretical grasp of each matter concerning his own good is the one [human beings] would call "practically wise," and it is to him that they would entrust such matters. That is why even some of the wild beasts are said to be practically wise—those that appear to have a capacity for forethought about their life.

It is evident too that theoretical wisdom and politics cannot be the same thing; for if people are to call the science that deals with what is beneficial to themselves "theoretical wisdom," there will be many theoretical wisdoms; for there will not be one dealing with the good of all animals but a different one dealing with each [sort], unless there is in fact one science of medicine for all beings. And if human beings are the best of the other animals, it makes no difference; for in fact there are other things that are far more divine in nature even than human beings—for example, the most manifest ones, those from which the cosmos is composed.

From what has been said, then, it is clear that theoretical wisdom is both scientific knowledge and understanding of the things that are by nature most estimable. That is why people say that Anaxagoras and Thales and others of that sort are wise but not practically wise when they see them ignorant of what is advantageous to themselves, and yet they say these men know what is extraordinary, wondrous, difficult, and daimonic, yet useless, because it is not human goods they seek.

Practical wisdom, on the other hand, is concerned with human affairs and what can be deliberated about; for of the practically wise person we say that this most of all is the work: to deliberate well. And nobody deliberates about what cannot be otherwise, or about such things as have no end at all that is a good doable in action. The unconditionally good deliberator, however, is the one capable of aiming at and

100. *APo*. 87a31–37.

hitting, in accord with rational calculation, the best for a human being of things doable in action.

Nor is practical wisdom of universals only. On the contrary, it must also know the particulars; for it is practical, and action is concerned with particulars. That is why even some people who lack knowledge, especially those with experience in other areas, are more effective doers of action than are others who have knowledge; for if someone knows that light meats are digestible and healthy but is ignorant about which sorts of meat are light, he will not produce health; but the one who knows that bird meats are healthy will produce health more. But practical wisdom is practical, so one must possess both sorts of knowledge—or this one more.

But here too there will be a sort that is architectonic.

6.8
Practical Wisdom and Politics

Politics and practical wisdom are the same state; however, the being for them is not the same. One sort of practical wisdom concerned with the city is the architectonic part, legislative science, while the part concerned with particulars has the name common to both: "politics." This part is practical and deliberative; for the decree is doable in action, as the last thing. That is why only these people are said to take part in political activity; for it is only they who do things in just the way handicraftsmen do.

It also seems that practical wisdom concerned with oneself as an individual is most of all practical wisdom, and it is this that has the name common to all the sorts, practical wisdom. Among the other sorts, one is household management, another legislative science, another politics, and of the latter, one part is deliberative and the other judicial.

Knowledge of what is good for oneself would certainly be one form of knowledge; but it admits of much difference.

Also, it seems that the person who knows about and spends his time on the things that concern himself is practically wise and that politicians are busybodies. That is why Euripides says:

> How can I be practically wise, when I could have minded my own business,
> And been numbered among the ranks of the army,
> sharing equally?
> For those who aim too high and occupy themselves too much. . . .[101]

For people seek what is good for themselves and think that this is what one should do. From this belief, then, has come the view that such people are the ones with practical wisdom. And yet a person's own welfare cannot be achieved, presumably,

101. *Philoctetes*, Fr. 787–788 Nauck.

without household management or without a constitution. Further, how the things that pertain to his own welfare are to be managed is unclear and must be investigated.

A sign of what has been said is that while young people become geometers and mathematicians and wise in such things, [a young person] does not seem to become practically wise. The cause is that practical wisdom is concerned also with particulars, which become known from experience. But a young person is not experienced; for it is quantity of time that produces experience. Also, one might investigate why it is that a child clearly can become a mathematician but cannot become a theoretically wise person or a natural scientist. Or isn't it that the objects in mathematics are given through abstraction, while the starting-points in theoretical wisdom or natural science come from experience, so that the young lack conviction there but only talk the talk, while in mathematics it is quite clear to them what each of the objects is?

Further, the error in deliberation might be either about the universal or about the particular; for [one might be in error about the fact] that all heavy sorts of water are bad or that this particular water is heavy. But that practical wisdom is not scientific knowledge is evident; for it is concerned with the last thing, as we said;[102] for what is doable in action is of this sort. It stands opposed, then, to understanding; for understanding is of the terms for which there is no reason, but practical wisdom concerns the last thing, of which there is not scientific knowledge but rather perception—not the perception of special objects but like the sort by which we perceive that the last thing among mathematical objects is a triangle; for it will stop there too. But this is more perception than practical wisdom, although of another form than that.

6.9
Good Deliberation

Inquiry and deliberation are different; for deliberation is inquiry of a certain sort. But we must also grasp what good deliberation is, whether some sort of scientific knowledge or belief or good guesswork or some other kind of thing.

Scientific knowledge it certainly isn't; for people do not inquire about things they **1142b1** know. But good deliberation is a sort of deliberation and a deliberator inquires and rationally calculates. But surely it is not good guesswork either; for good guesswork, indeed, is without reason and is also something quick, while one deliberates for a long time. And they say that though we should act quickly on the results of our deliberation, we should deliberate slowly.

Further, acumen is different from good deliberation, and acumen is a sort of good guesswork.

Neither, indeed, is good deliberation any sort of belief. On the contrary, since a bad deliberator makes an error and a good one deliberates correctly, it is clear

102. 1141b14–15, 25–28.

that good deliberation is some sort of correctness—correctness neither of scientific knowledge nor of belief; for of scientific knowledge there is no correctness (for there is no error either), and of belief correctness is truth. At the same time, everything about which there is belief is already determined. But, surely, without reason there is no good deliberation either.

Therefore, it remains for it to be correctness of thought; for thought is not yet affirmation; for in fact belief is not inquiry but already a sort of affirmation, while a deliberator, whether he deliberates well or badly, is inquiring about something and rationally calculating.

But good deliberation is a certain sort of correctness of deliberation. That is why we must inquire first what deliberation is and what it concerns. Since correctness is of more than one sort, however, it is clear that deliberation's correctness will not be any and every sort; for the person who lacks self-control or the base person will, if he is clever,[103] reach as a result of rational calculation what he proposes to do, so that he will have deliberated correctly but will have gotten hold of a great evil. But it seems to be a good thing to have deliberated well; for it is this sort of correctness of deliberation that is good deliberation—the sort that is able to gain a good.

One can, however, also reach this by a false deduction—that is, reach the thing one should do but not by the means one should, the middle term being false. So this is not yet good deliberation—where one reaches what should be done, yet not by the means one should.

Further, one person may deliberate a long time to reach it, while another does so quickly. The former, then, is not yet a case of good deliberation, which is correctness in accord with what is beneficial and about what to do, how to do it, and when to do it.

Further, it is possible to deliberate well either unconditionally or in relation to a particular end. Unconditionally good deliberation correctly furthers the unconditional end, the particular sort, some particular end. If it is characteristic of practically wise people to have deliberated well, then good deliberation will be the sort of correctness that is in accord with what is advantageous in furthering the end about which practical wisdom is the true supposition.

6.10
Comprehension

Comprehension and good comprehension—those states by which we say people comprehend or comprehend well—are not, in general, the same as scientific knowledge nor as belief (for if they were, everyone would have comprehension), nor are **1143ª1** they any one of the sciences dealing with a particular area, as medicine is concerned

103. Reading εἰ δεινός.

with healthy things, geometry with magnitudes. For comprehension is not concerned with what always is and is unchanging, nor is it concerned with just any of the things that come to be but with those one might puzzle and deliberate about. That is why it is concerned with the same things as practical wisdom, although comprehension is not the same as practical wisdom. For practical wisdom is prescriptive (for what should be done or not is its end), while comprehension is an ability to judge only. (For comprehension and good comprehension are the same, as are those with comprehension and those with good comprehension.)

Comprehension is neither having practical wisdom nor acquiring it. Comprehension is neither having practical wisdom nor acquiring it. But just as learning is said to be comprehending whenever someone is using scientific knowledge, it is also so called whenever someone is using belief to judge—and judge correctly—about matters with which practical wisdom is concerned, when someone else is speaking of them. For judging well is the same as judging correctly. And this is where the name "comprehension" (*sunesis*)—in the sense of what makes people have good comprehension (*eusunetoi*)—came from, the comprehension involved in learning; for we often call learning "comprehending."

6.11
Consideration, Understanding, and Practical Wisdom

What is called "consideration" (*gnômê*), due to which people are said to be sympathetically considerate (*sungnômones*) and to have consideration, is the correct judgment of what is decent. A sign of this is that we say that it is the decent person, above all, who is sympathetically considerate, and that to be decent in certain cases is to be sympathetically considerate. Sympathetic consideration, then, is the correct consideration that judges matters of what is decent. And the correct sort of consideration is of that which is true.

All these states are reasonably taken to tend in the same direction; for we attribute consideration, comprehension, practical wisdom, and understanding to the same people and say they actually have consideration and understanding when they are practically wise and comprehending. For all these capacities are concerned with things that come last, that is, particulars. And it is especially in being able to judge in matters with which the practically wise person is concerned that one is comprehending and sympathetically considerate; for what is decent is the common concern of all good people in relation to another. And all the things doable in action are among particulars—that is, the things that come last; for the practically wise person must also know these, and comprehension and consideration are concerned with things doable in action; and these are things that come last.

Also, understanding is concerned with things that come last in both directions; for concerning both the primary terms and the things that come last, there

is understanding but not reasoning—that is to say, on the one hand, in the case of demonstrations, understanding is of the unchanging and primary terms; on the **1143^{b}1**
other hand, in the case of those that are practical, it is of the last thing and the one that admits of being otherwise and the other premise; for these are starting-points of the for-the-sake-of-which, as it is from particulars that universals come. So of these we must have perception, and this is understanding. {That is why understanding is 5
both starting-point and end; for demonstrations are from these and concerned with 10
these.}[104]

That is why these things even seem to be natural—and why, while nobody seems wise by nature, people do seem to have consideration, comprehension, and understanding by nature. A sign of this is that we also think these states correspond to the stages of life and that a particular stage brings understanding and consideration, as if nature were the cause. {. . .}[105] So one should attend to the undemonstrated sayings 9–11
and beliefs of experienced and older people or practically wise ones, no less than to the demonstrations; for because they have an eye formed from experience they see correctly.

We have said, then, what practical wisdom and theoretical wisdom are, what each of them is concerned with, and that each is the virtue of a different part of the soul. 15

6.12
Practical Wisdom, Theoretical Wisdom, and Cleverness

One might, however, go through some puzzles about what these virtues are useful for. For theoretical wisdom will not have a theoretical grasp on any of the things from which a human being will come to be happy (for it is not concerned with anything's coming to be), and while practical wisdom does have this grasp, what does one need 20
it for? For if practical wisdom is indeed the virtue concerned with things just and noble and good for a human being, and these are the ones it is characteristic of a good man to do, knowledge of them, however, in no way makes us more likely to do them (if indeed states are what the virtues are). Then it will be exactly the same as in the case of things relating to health or things relating to good physical condition (I 25
mean those so called not for producing the state but for resulting from it); for we are in no way more likely to do them because of knowing medicine or physical training.

If, on the other hand, we are to say that being practically wise is not useful for this but for becoming [good], to those who are excellent it would be of no use. Further, it would be of none to those who do not have it; for it will make no difference whether they have it themselves or they put their trust in others who have it. And this 30

104. Transposed from 1143^{b}9–11.
105. Read following 1143^{b}5.

would be enough for us just as in the case of health; for while we wish to be healthy, nonetheless, we do not learn medicine.

In addition to these considerations, it would seem strange if practical wisdom, though inferior to theoretical wisdom, were to have more control than it; for what produces each thing also rules and issues prescriptions concerning it. About these issues, then, we must speak; for so far we have only raised the puzzles relating to them.

1144a1 First of all, let us state that these states must certainly be intrinsically choiceworthy (for each is the virtue of one of the two parts [that have reason]) even if neither of them produces anything at all.

Next, they do indeed produce something; not, however, as medicine produces health, but as health does.[106] That is also how theoretical wisdom produces happiness; for as a part of virtue as a whole, by being possessed and activated, it makes a person happy.

Further, our work is completed in accord with practical wisdom and virtue of character; for virtue makes the target correct, while practical wisdom makes what furthers it correct. Of the fourth part of the soul, the nutritive, there is no virtue of this sort; for there is no action that is up to it to do or not do.

With regard to our being in no way more likely to do noble actions and just actions because of practical wisdom, let us start a little further back, taking the following as a starting-point. For we also say that some people who do just things are still not just (for example, those who do what is prescribed by the laws either involuntarily, because of ignorance, or because of something else, and not because of the actions themselves), and yet they at least do the actions one should do, and those the excellent person must do. Likewise, so it seems, it is possible for someone to do each sort of action by being in the sort of state that makes him a good person—I mean, for example, to do them because of deliberate choice and for the sake of the actions themselves.

Virtue, then, makes the deliberate choice correct, but as to whatever should naturally be done for the sake of carrying it out—that is not the business of virtue but of a different capacity. However, we must get scientific knowledge of these things and discuss them in a more perspicuous way.

There is, indeed, a capacity they call "cleverness," and this is the sort of thing that, when it comes to the things that further hitting a proposed target, is able to do these and to hit upon them.[107] If, then, the target is a noble one, this capacity is praiseworthy, but, if it is a base one, it is unscrupulousness. That is why we call both practically wise people and unscrupulous ones[108] "clever." Practical wisdom, however, is not the capacity of cleverness but does not exist without this capacity.

But the state, the one pertaining to this eye of the soul, does not come about without virtue, as we have said and as is clear; for practical deductions have a starting-point, since

106. *Rh.* 1362a31–34.
107. Reading αὐτῶν.
108. Reading τοὺς πανούργους.

the end—that is, what is best—is such-and-such, whatever it may be (let it be any random thing for the sake of argument); this, however, is not apparent except to the good person; for depravity produces distortion and false views about practical starting-points. So it is evident that it is impossible to be practically wise without being good.

6.13
Natural Virtue, Virtue in the Strict Sense, and Practical Wisdom

Virtue, then, must also be investigated again; for virtue is also much the same way: **1144b1** as practical wisdom is related to cleverness—not the same but similar—so natural virtue is related to virtue in the strict sense. For everyone thinks that each character trait is possessed in some way by nature; for we are in fact just, disposed to temperance, courageous, and have the rest of them straight from birth. Nonetheless, we seek something else as what is fully good and for such qualities to be possessed in another way. For to both children and wild beasts these natural states also belong; but without understanding they are manifestly harmful. Besides, this much we can surely see: that just as a heavy body moving around without sight suffers a heavy fall because it has no sight, so it happens in this case too.

But if someone acquires understanding, it makes a difference in his action; and his state, though similar to the one he had, will then be virtue in the strict sense. So, just as in the case of the part that forms beliefs there are two forms of condition (cleverness and practical wisdom), so also in the part responsible for character there are two (natural virtue and virtue in the strict sense), and of these, virtue in the strict sense does not come into being without practical wisdom.

That is why indeed some people say that all the virtues are sorts of practical wisdom and why, in one respect, Socrates used to inquire correctly but, in another, erroneously; for in thinking that all the virtues were sorts of practical wisdom, he was in error, but in saying that they did not exist without practical wisdom, he spoke correctly.

There is a sign of this; for even now everyone, when defining virtue and having named the state and what it is concerned with, adds "the one in accord with correct reason"—and correct is what is in accord with practical wisdom. It would seem, then, that all people somehow divine that this sort of state is virtue—the one in accord with practical wisdom.

We, however, should go a little further. For virtue is not merely the state that is in accord with correct reason but the one that also involves correct reason. And correct reason about such matters is practical wisdom. Socrates, then, thought that the virtues were cases of reason (all being cases of scientific knowledge),[109] while we think that they involve reason.

109. E.g., Plato, *Laches* 199a–b.

It is clear, then, from what we have said, that it is not possible to be either fully good without practical wisdom or practically wise without virtue of character. Moreover, in this way we can also resolve the argument by which someone might contend dialectically that the virtues are separate from each other; for the same person is not naturally well-disposed in the highest degree concerning all of them, so that he will at some point have acquired one when he has not yet acquired another. In the case of the natural virtues, indeed, this is possible, but in the case of those in accord with which someone is called "unconditionally good," it is not possible; for at the same time as the one, practical wisdom, is present, they will all be present.

And it is clear that even if practical wisdom were not concerned with action, we would need it because it is the virtue of a part [of the soul]; clear too that deliberate choice will not be correct without practical wisdom or without virtue; for virtue makes us do the actions that the end consists in, while deliberate choice makes us do the actions that further it.

But yet it does not control either theoretical wisdom or the better part any more than medicine controls health; for it does not use it but sees to its coming into being. So it prescribes for its sake, not to it. Besides, it would be like saying that politics rules the gods, because it prescribes with regard to everything in the city.

BOOK 7

7.1
Beastliness, Lack of Self-Control, Method

Next, we must make a fresh start and say that the things having to do with character that are to be avoided are of three forms: vice, lack of self-control, and beastliness. It is clear what the contraries of two of these are; for we call the one "virtue" and the other "self-control." As regards the contrary of beastliness, it would be most fitting to speak of a virtue that is beyond us, one of a heroic and divine sort—as when Homer has Priam say that Hector was exceptionally good: "nor did he even seem the son of a mortal man, but rather of a god."[110] So if, as they say, human beings become gods because of an excess of virtue, it is clear that the state opposed to the sort that is beast-like will be of this sort. And just as there is in fact neither vice nor virtue of a wild beast, neither is there of a god. But his state is more estimable than virtue, while that of a wild beast is of another kind than vice.

And since a divine (*theios*) man (as the Spartans tend to call someone they particularly admire, when they say in their dialect that he is a "*seios* man") is a rare thing, so the beast-like sort is also rare among human beings. It occurs most among barbarians,

110. Homer, *Iliad* 24.258–259.

although some cases in fact come about because of disease or disabilities. We also use "beast-like" as a term of abuse for those who exceed human beings in their vice. But about this disposition we will have to make some mention later on; about vice we spoke earlier.[111]

But about lack of self-control and softness (or effeminacy), we must now speak, as well as about self-control and resilience; for we must not suppose that either of the two is concerned with the same states as virtue and depravity or that they are of another kind than virtue and depravity.

We must, as in the other cases, set down the things that appear to be so and first go through the puzzles, and in that way prove preferably all the acceptable beliefs about these affections, or if not all of them, then most of them, and the most authoritative ones; for if the objections are resolved and the acceptable beliefs are left standing, that would be an adequate proof.

Both self-control and resilience seem to be among the excellent things and praiseworthy ones, while lack of self-control and softness seem to be among the base and blameworthy ones.

Also, the self-controlled person and the one who is disposed to stand by his rational calculation seem to be the same, as do the person who lacks self-control and the one who is disposed to depart from his rational calculation. And the person who lacks self-control, knowing that what he does is base, does it because of feeling, while the one who has self-control, knowing that his appetites are base, does not follow them, because of his reason.

Also, some people say that the temperate person is self-controlled and resilient, some saying that all of the latter sort are temperate, others that they are not, but all also saying that the intemperate person lacks self-control and that the one who lacks self-control is intemperate, lumping both together. Others, however, say these sorts of people are different. Sometimes they say that it is impossible for a practically wise person to lack self-control, although sometimes they say that some people who are practically wise and clever do lack self-control.

Further, people are said to lack self-control also in relation to spirit, honor, and profit.

These, then, are the things that are said.

7.2
Puzzles about Lack of Self-Control

Someone might be puzzled about what sort of correct supposition one has when one acts without self-control.

111. 1148[b]18–24 (beast-likeness), Books 3–4 (vice).

Some people say, certainly, that when one has scientific knowledge, it is not possible; for it would be terrible—as Socrates used to think[112]—if, when scientific knowledge is present, something else is in control and drags it around like a slave. For Socrates used wholly to combat this account, on the supposition that there is no such thing as lack of self-control; for no one, while supposing that he is doing so, acts contrary to what is best but acts that way only because of ignorance.

This argument certainly contradicts what plainly appears to be the case, and so we must inquire about the affection of the person who lacks self-control, if he acts because of ignorance, as to what manner of ignorance it turns out to be. For before he is affected, at any rate, it is evident that an agent acting without self-control does not think that he should do the action.

There are some people who grant some, but not other, parts of this; for they agree that nothing is stronger than scientific knowledge but do not agree that no one acts contrary to what he believes to be better and, because of this, they say that it is not when the person who lacks self-control has scientific knowledge that he is controlled by pleasures but when he has belief.

But surely, if indeed it is belief, not scientific knowledge, and it is not a strong supposition that is resisting but a weak one, like that found in people who are in doubt, there will be sympathetic consideration for failure to stand by such beliefs in the face of strong appetites. But for depravity there is no sympathetic consideration, nor for any other blameworthy thing.

What, then, if practical wisdom is what is doing the resisting? For it is strongest. But that would be a strange thing; for the same person would be at the same time practically wise and lacking in self-control, and no one would say that it is characteristic of a practically wise person to do the worst actions voluntarily. Besides, it was proved earlier[113] that a practically wise person is indeed a doer of action (for he is concerned with last things) and has the other virtues.

Further, if someone cannot be self-controlled unless his appetites are strong and base, the temperate person will not be self-controlled nor the self-controlled one temperate; for it is not characteristic of the temperate person to have appetites that are too strong or ones that are base. Yet they must be both; for if his appetites are good, the state that prevents him from following them must be base, so that not all self-control will be excellent; on the other hand, if they are weak and not base, self-control will be nothing very wonderful, while if they are base and weak, it will be nothing great.

Further, if self-control makes one disposed to stand by every belief, it is base—for example, if it makes him do so even when the belief is false. Also, if lack of self-control makes a person disposed to depart from every belief, there will be a sort of lack of self-control that is excellent—for example, Neoptolemus in Sophocles'

112. Plato, *Protagoras* 352b–c.

113. 1141b14–22, 1143a25–35, 1144a34–b1, 1144b30–1145a6.

Philoctetes. For he is praiseworthy for not standing by what Odysseus persuaded him to do, because it pains him to tell a falsehood.

Further, a certain sophistical argument constitutes a puzzle; for because [sophists] wish to refute people in unacceptable ways, in order to be clever when they engage in argumentative encounters,[114] the resulting deduction turns into a puzzle; for thought is tied up when it does not wish to stand still, because what has been concluded is not pleasing, but cannot move forward, because of its inability to resolve the argument. It follows from a certain argument, then, that foolishness combined with lack of self-control is virtue; for due to lack of self-control one does what is contrary to what one supposes one should, but since one supposes that bad things are good and that one should not do them, one will do the good ones and not the bad ones.

Further, the person who, by being persuaded, does or pursues pleasant things, deliberately choosing so would seem to be better than the one who does so not because of rational calculation but because of lack of self-control; for the first one is more easily cured, because he might be persuaded to act otherwise, while the person who lacks self-control is subject to the proverb: "When water is choking you, what will wash it down?" For if he had been persuaded to do what he is doing, he would have stopped if he was persuaded to act otherwise. As things stand, however, persuaded of one thing, he nonetheless does the other.[115]

Further, if there is lack of self-control and self-control concerning all things, who is it that is unconditionally lacking in self-control? For no one has every sort of lack of self-control, yet we do say that some people are unconditionally such.

These, then, are the sorts of puzzles that arise, and thus some things must be confuted, others left standing; for the resolution of a puzzle constitutes a discovery.

7.3
Lack of Self-Control and Knowledge

We must investigate first, then, whether the person who lacks self-control acts knowingly or not and in what way knowingly, and next, what sorts of things we must take the person who lacks self-control and the person who has it to be concerned with (I mean, whether they are concerned with every sort of pleasure and pain or with some determinate sorts), and whether the self-controlled person and the resilient one are the same or different; and similarly as regards other matters germane to this theoretical investigation.

The starting-point of the investigation is whether the person who has self-control and the person who lacks it differ in the things they are concerned with or in the way they are concerned with them—I mean, whether the person who lacks self-control

114. Reading ἐντύχωσιν.
115. Reading νῦν δὲ πεπεισμένος ἄλλα οὐδὲν ἧττον ἄλλα πράττει.

lacks it solely by being concerned with these particular things or solely by the way he is concerned with them, or not solely by either of these, but because of both. Next, whether there is lack of self-control and self-control concerning all things, or not. For the person who unconditionally lacks self-control is not concerned with all things, but rather with the very same ones as the intemperate person. Nor does he lack self-control by being unconditionally related to these (for then it would be the same as intemperance), but rather by being related to them in a certain way. For the intemperate person is led on by deliberate choice, thinking that he should always pursue the present pleasure, while the one who lacks self-control does not think this but pursues it anyway.

As regards the view that it is true belief and not scientific knowledge that people who act without self-control act contrary to, this makes no difference to the argument; for some people with belief are not in doubt but think they have the most exact knowledge. If, then, it is because of the weakness of their conviction that those with belief are more likely than those with scientific knowledge to do actions contrary to their supposition, scientific knowledge will be no different here from belief; for some people have no less conviction about what they believe than others do about what they know scientifically—something Heraclitus makes clear enough.[116]

But since we speak of knowing scientifically in two ways (for both the person who has but is not using his scientific knowledge and the one who is using it are said to know scientifically), there will be a difference between having knowledge while not actively contemplating and having knowledge while actively contemplating the actions one should not do (for this is what seems bizarre, although not if one is not actively contemplating them).

1147a1 Further, since there are two modes of premises, nothing in fact prevents the person who has both from acting against his scientific knowledge, provided he makes use of the universal one, but not of the particular one; for the particular ones are what are doable in action. And there is also a difference in what is universal; for one applies to the agent himself and the other to the thing—for example, that dry foods are advantageous for every human being and that he himself is a human being, or that such-and-such sort of food is dry. But that this is of such-and-such sort, he either does not have or is not activating. Between these ways, then, there is an enormous difference, so that for him to know in the way described seems not at all strange but, in the other way, amazing.

Further, human beings can have scientific knowledge in a way other than the ones we have just described; for among those who have but are not using it we see a difference in the having of the state, so that someone both has it in a way and does not have it—for example, if he is sleeping, mad, or tipsy. But surely this is the way people who are indeed in the grip of their feelings are disposed; for spirited feelings, sexual appetites, and some things of this sort clearly alter the condition of the body as

116. †*MM* 1201b5–9.

well and in some people even produce states of madness. Clearly, then, we must say that people who lack self-control are in a state similar to these people.

But the fact that they talk the talk that stems from scientific knowledge signifies nothing; for those in the grip of these feelings can even recite demonstrations and verses of Empedocles. And those who have first learned something string the words together but do not yet know what they have learned; for it must grow to be a natural part of them, and that takes time. So we must suppose that those acting without self-control in fact speak like actors on a stage.

Further, we might look into the cause of acting without self-control by appealing to natural science as follows. For one belief is universal, while the other is concerned with particulars, which perception already controls. But when a single belief comes about from these, the soul, in one sort of case, necessarily affirms what has been concluded, while in productive cases it acts straightaway. For example, if everything sweet should be tasted and this (as one of the particulars) is sweet, it is necessary for the person who is able and not prevented also to do it at once. Whenever, then, one universal premise is in the agent preventing tasting, as well as another (that everything sweet is pleasant) and this is sweet (and this one is active) and there happens to be an appetite in him, the one premise says, avoid this! but the appetite leads him on (for it is capable of moving each of the parts), the result is that from reason, in a way, and from belief, he acts without self-control. The belief, however, is not intrinsically, but coincidentally, contrary to correct reason (for what is contrary is the appetite, not the belief).

(So it is also because of this that wild beasts do not lack self-control, that they do not have a universal supposition but only imagination and memory of particulars. As for how the ignorance of an agent who lacks self-control is resolved and he recovers his scientific knowledge, the account is the same as in the case of a tipsy person and a sleeping one and is not special to this way of being affected; it is one we must hear from the natural scientists.[117])

Since the final premise both is a belief about something perceptible, however, and controls actions, either an agent does not have this when he is being affected or he has it in such a way as to have not scientific knowledge of it but to talk the talk, like a tipsy person with the verses of Empedocles. And because the last term is not universal and does not seem to be scientifically knowable in the way the universal is, even the result Socrates was seeking would seem to come about; for neither is it scientific knowledge in the strict sense that seems to be actively present when this way of being affected comes about, nor is it what is dragged around because of feeling, but rather the perceptual sort.

So much, then, for knowing and not knowing and for how it is possible to know and yet to act without self-control.

117. *MA* 11.

7.4
Unconditional Lack of Self-Control

We must next discuss whether there is anyone who unconditionally lacks self-control (or whether all people who lack self-control do so partially), and if there is, concerning what sorts of things.

As regards pleasures and pains, it is evident that there are people who have self-control and are resilient as well as people who lack self-control and are soft. Some of the things productive of pleasure are necessary, however, and others are intrinsically choiceworthy but can be taken to excess. The necessary ones are the bodily ones (I mean such things as the ones concerned with nourishment or the need for sex, that is to say, such bodily ones as we took[118] temperance and intemperance to be concerned with). Others are not necessary but intrinsically choiceworthy (I mean, for example, victory, honor, wealth, and other such things as are good and pleasant). So—since all that is the case—when people, contrary to the correct reason that is in them, go to excess in relation to the intrinsically choiceworthy ones, we do not say that they unconditionally lack self-control but add that they lack self-control regarding wealth, profit, honor, or spirit. We do not say that they unconditionally lack self-control, on the supposition that they are different and that they are called "lacking in self-control" by similarity to those who unconditionally lack it (this is like saying the victor at the Olympic Games is human[119]); for, in his case, the common account differed only slightly from the special one, but was different nonetheless.

A sign of this is that lack of self-control, whether unconditional or partial, is blamed not only as an error but also as a sort of vice, while none of these other conditions is blamed.

But of those concerned with bodily gratifications (the ones that we say the temperate person and the intemperate person are concerned with), the person who goes to excess in pursuing these pleasant things and avoiding the painful ones (hunger, thirst, heat, cold, and all those concerned with touch and taste), not having deliberately chosen to, but instead contrary to his deliberate choice and thought, is called "lacking in self-control," not with the addition of what he lacks self-control about (for example, anger), but just unconditionally so.

A sign of this is that people are also called "soft" where these sorts of bodily pleasures and pains—but not any of the others—are concerned.

It is because of this too that we put the person who lacks self-control and the one who is intemperate in the same class (and also a self-controlled one and

118. 1118a1–b8.

119. A man named "Human" was a boxing champion in the Olympic Games of 456 BC. He is *a* human, so that the account common to all human beings also applies to him. At the same time, there is also an account special to him that differs only slightly from the common one.

a temperate one), but none of the others. This is because the former are concerned, in a way, with the same pleasures and pains. But though these people are concerned with the same things, they are not concerned with them in the same way; instead, some of them act from deliberate choice, while others do not act from deliberate choice. That is why we should rather give the name intemperate to the person who has no appetite or only a weak one for excessive pleasures, yet pursues them and avoids moderate pains, than to the person who does so because of having an intense appetite; for what would such a person do if he came to develop a vigorous appetite for the necessary pleasures and felt a strong pain at their lack?

Some appetites and pleasures have objects that are noble and excellent as a kind (for some pleasant things are by nature choiceworthy, while others are the contrary and others in between, as we determined earlier[120]—for example, wealth, profit, victory, and honor). So, as regards all things of this sort, and all the in-between ones, people are blamed not for being affected by them (that is, having an appetite for them and loving them) but for being affected in a certain way—that is, excessively. That is why those who, contrary to reason, are either controlled by or pursue some of these naturally noble and good things are blamed—for example, those who are more serious about honor than they should be or about children and parents; for though these are indeed good things and people are praised for being serious about them, nonetheless there is a sort of excess even in their case—for example, if someone were to be like Niobe and get in a fight even with the gods, or to behave toward his father like Satyrus, the so-called father-lover did—since Satyrus seemed to be utterly foolish about him.[121] So there is no depravity in these cases, because of what we have just said, that each of them is naturally choiceworthy because of itself, while excesses of them in their turn are base and to be avoided.

Similarly, there is no lack of self-control here either; for lack of self-control is not only something to be avoided but also blameworthy. But because of the similarity in the way of being affected, people call it "lack of self-control," adding that it has to do with a particular thing, as they call someone a "bad doctor" or a "bad actor," whom they would not call "unconditionally bad," because neither of these conditions is badness, but only like it by analogy. In the same way, it is clear that here too the only condition one must take to be self-control or lack of self-control is that which is concerned with the same things as temperance and intemperance, though by similarity we speak of it in relation to spirit. That is why we add the qualification and say lacking in self-control in relation to spirit, just as in relation to honor or in relation to profit.

120. 1147^{b}28–30.

121. He supposedly committed suicide on hearing of the death of his father.

7.5
Beast-Like, Diseased, and Morbid Conditions

Given that certain things are pleasant by nature, and of these, some are unconditionally so, while others are so with reference to particular kinds of animals and of human beings, while others are not, but come to be so (some because of a disability, some because of habit, some because of depraved natures), it is possible to see the states corresponding to each of these. I mean the beast-like ones—for example, that of the female who people say used to rip open pregnant women and devour their children; or the pleasures said to be enjoyed by some of the savages who live around the Black Sea,[122] some of whom eat raw meats, some human flesh, while others are said to reciprocally lend their children to each other to be eaten at festivities; or what they say about Phalaris. These states are beast-like.

Some, however, come about because of diseases (even because of madness, in some cases, like the man who sacrificed and ate his mother, or the one who ate the liver of his fellow slave). Others are morbid conditions arising from habit[123]—for example, plucking out one's hair or chewing on one's nails or even on pieces of charcoal and earth, and besides these, sexual intercourse between males. In some cases, these come about naturally; in some as a result of habit—for example, those who suffer wanton aggression from childhood on. If nature were the cause, no one would call these people "lacking in self-control" any more than one would call women such because they have the passive rather than the active role in copulation. The same goes for those who are in a morbid condition because of habit.

On the one hand, then, having each of these conditions is outside the defining marks of vice, just as beastliness also is. On the other hand, having them and exercising control over them or being controlled by them is not unconditional lack of self-control, but rather lack of self-control by resemblance, as the person who is in this condition where spirited feelings are concerned must be called "lacking in self-control by way of his feelings" but not "lacking in self-control." For among all excessive states, whether of foolishness, cowardice, intemperance, and harshness, some are beast-like, while others are morbid conditions; for the one who is by nature the sort of person to fear everything—even the squeak of a mouse—is cowardly with a beast-like cowardice, while the individual who was afraid of his weasel was so because of a disease. Among foolish people as well, those who are naturally without rational calculation and so live by perception alone—like some remote barbarian races—are beast-like, while others are foolish because of diseases, such as epilepsy, or because of morbid madness.

Among these conditions, however, there are some it is possible to have sometimes without being controlled by them (I mean, for example, if Phalaris had an appetite

122. *Pol.* 1338b19–23.
123. Secluding ἢ.

for eating a child or for some strange sexual pleasure, but restrained it). But it is also possible to be controlled by them and not just to have them.

Just as is also the case with depravity, then, where the sort that is on a human level is called "depravity" unconditionally while the other sort is so called with the addition that it is a beast-like or a morbid condition, but not unconditionally, in the same way it is clear that lack of self-control too is in some cases beast-like and in others a morbid condition, while the unconditional sort is that in accord with human-level intemperance alone.

It is clear, then, that lack of self-control and self-control are concerned only with the very same things as intemperance and temperance, and that concerning the other things there is another form of lack of self-control that is so called by transference and not unconditionally.

7.6
Lack of Self-Control Due to Spirit and Appetite

Let us next get a theoretical grasp on the fact that spirit's lack of self-control is less shameful than appetite's. For spirit seems to listen a bit to what reason says but to mishear it, like hasty servants who run off before they hear the whole of what is said and then mistake the command, or dogs that before investigating to see if it is a friend bark at a sound alone. In the same way spirit, because of its hot and hasty nature, though hearing something, not hearing a command, rushes off to exact revenge. For reason or imagination has revealed that wanton aggression or contemptuous treatment has occurred, and spirit—as if deducing that this sort of thing must be fought against—becomes angry straightaway. Appetite, on the other hand, only needs reason or perception to say that this is pleasant, and it impulsively rushes off to indulge itself. So spirit follows reason, in a way, but appetite does not. Hence it is more shameful; **1149b1** for the person who lacks self-control regarding spirit is defeated by reason in a way, the other one by appetite and not by reason.

Further, there is more a feeling of sympathetic consideration for people who follow natural desires, since there is more even in the case of those appetites that are common to all, and to the extent that they are common. But spirit and ill-temper are more natural than are appetites for excess and for things that are not necessary. It is like the case of the son defending himself for beating his father: "Yes, indeed I did beat him," he said, "but he beat his father, and he beat his," and, pointing to his own young child, he said, "and he'll beat me when he becomes a man—it runs in the family." Or the man, being dragged by his son, who used to urge him to stop at the front door since in fact that was as far as he had dragged his own father.

Further, people who are more given to plotting are more unjust. The spirited person does not plot, and neither does spirit; on the contrary, it is out in the open. But appetite, as they say about Aphrodite, is "a weaver of guile, indeed, from Cyprus

sprung," and, as Homer says of her embroidered girdle, "an allurement that steals understanding from the wisest minds."[124] So, if indeed this sort of lack of self-control is more unjust and more shameful than that having to do with spirit, it is unconditional lack of self-control and, in a way, vice.

Further, no one feels pain while committing wanton aggression, but everyone who does it in anger is pained by doing it, while the wantonly aggressive person does what he does with pleasure. If, then, those acts it is most just to be angry at are more unjust, so too is the lack of self-control that comes about because of appetite; for there is no wanton aggression in spirit.

It is clear, then, that lack of self-control regarding appetites is more shameful than lack of self-control regarding spirit, and that self-control and lack of self-control are concerned with appetites and pleasures that are bodily; however, there are differences among these appetites and pleasures that we need to grasp. For as we said[125] at the start, some of them are human and natural both in kind and magnitude, some are beast-like, while some are due to disabilities or diseases. Temperance and intemperance are concerned only with the first of these. That is why we do not say that wild beasts are either temperate or intemperate except by transference, that is, if one[126] kind of animal is wholly different from others in wanton aggression, as it may be, or destructiveness or gluttony. For they do not have deliberative choice or rational calculation, but are a degeneration from nature, like madmen among human beings.

1150a1 Beastliness is a lesser thing than evil (although it is more frightening); for the better thing has not been destroyed, as in the human case, but is just not present. So it is like comparing something inanimate to something animate, to see which is worse; for the baseness of what does not possess the starting-point is always less destructive, and understanding is a starting-point. So the comparison is much the same as that between injustice and an unjust human being. For there is a way in which each is worse—for an evil human being will do ten thousand times as much evil as a beast.

7.7
Lack of Self-Control, Intemperance, Softness, and Resilience

As regards the pleasures and pains that come about through touch and taste, as well as the appetites for them and the avoidances of them (that is, the ones we earlier determined[127] were the concern of both intemperance and temperance), it is possible for someone to be in a state such that he is defeated even by those that ordinary people are stronger than, and possible to control even those that ordinary people are defeated by. Among these, as regards pleasures, the one is self-controlled and the

124. *Iliad* 14.214, 217.
125. 1148b15–18.
126. Reading τι.
127. 1118a1–b8.

other lacks self-control, while as regards pains, the one is soft and the other resilient. The state of most people lies in between these, even though they may incline more toward the worse ones.

But since some pleasures are necessary, while others are not, and the former are so, up to a point, while their excesses and deficiencies are not, and similarly as regards both appetites and pains, the person who pursues the excesses of pleasures (or does so to excess) and does so because of deliberate choice,[128] because of the pleasures themselves and not because of any further consequence, is intemperate; for he necessarily has no regrets and so is incurable; for the sort of person who has no regrets is incurable. (The person who is deficient is his opposite, while one in a mean is temperate.) It is the same way for the one who avoids bodily pains not because he is defeated but because of deliberate choice.

(Among those who do not act from deliberate choice, one is led on because of the pleasure, another because he is avoiding the pain that comes from appetite, so that these differ from each other. Everyone would think someone to be worse, however, if he did a shameful action with either no or weak appetite than if he did it with intense appetite, and worse for striking someone when he was not angry than for doing it when he was angry; for what would he have done if he were in the grip of these feelings? That is why the intemperate person is worse than the one who lacks self-control.)

Among the cases mentioned, then, one is more a form of softness, while the other person is intemperate.

The person with self-control is the opposite of the person without it, and a resilient one is the opposite of one who is soft; for being resilient consists in resisting, self-control in controlling. And resisting is different from controlling, just as not being defeated is different from winning. That is why self-control is more choiceworthy than resilience.

The person who is deficient concerning the things that ordinary people both resist **1150^{b}1** and are capable of resisting is soft and effeminate; for in fact effeminacy is a sort of softness. Such a person trails his cloak on the ground in order not to suffer the pain of lifting it up, and, while acting like an invalid, does not think himself a wretched person, while being like one.

Similar things also hold concerning self-control and lack of self-control. For if someone is defeated by strong or excessive pleasures or pains, it is not surprising. Rather, it merits sympathetic consideration provided that he holds out against them—like the *Philoctetes* of Theodectes when bitten by the snake or like Cercyon in the *Alope* of Carcinus or like people trying to restrain their laughter who suddenly burst out laughing, as happened to Xenophantus. But it is surprising if someone does this in connection with things that ordinary people are capable of resisting, and if he is defeated by these and is incapable of holding out, not because of his congenital

128. Reading ἢ καθ' ὑπερβολὴν καὶ.

nature (as, for example, in the Scythian kings whose softness is congenital), or because of disease, or as female is distinguished from male.[129]

An amusement lover, for his part, also seems to be intemperate, but he is actually soft. For amusement is a loosening up, if indeed it is a relaxation, and an amusement lover is one of those who go to excess where relaxation is concerned.

One sort of lack of self-control is impetuosity, another is weakness. For the latter, though they have deliberated, do not stand by the results of their deliberations because of feeling, while the former are led on by their feelings because they have not deliberated; for just as those who tickle first cannot be tickled back, some of these people, if they are aware of it beforehand and have seen it coming and have roused themselves and their capacity for rational calculation ahead of time, are not defeated by what they are feeling, whether pleasant or painful.

It is most of all quick-spirited and impulsive people who are lacking in the self-control that is impetuous lack of self-control. For it is because of the hastiness in the one case and because of the intensity in the other that they do not wait for reason, because they are the sort of people who follow appearances.

7.8
Why Intemperance Is Worse Than Lack of Self-Control

The intemperate person, as we said,[130] is not the sort to have regrets; for he stands by his deliberate choice, while everyone who lacks self-control has regrets. That is why things are not the way we suggested in listing the puzzles.[131] Instead, the intemperate person is incurable, while the one who lacks self-control is curable; for depravity resembles diseases like dropsy or consumption, while lack of self-control is like epilepsy; for depravity is continuous wickedness, while lack of self-control is not. And, in general, lack of self-control and vice are distinct in kind; for vice escapes its possessor's notice, while lack of self-control does not escape it.

Among people who lack self-control themselves, those who are disposed to depart **1151a1** from reason are better than those who have the reason but do not stand by it; for the latter give in to a weaker way of being affected and do not act without prior deliberation as the former sort do; for the person who lacks self-control is like those who get drunk quickly and on a little wine or on less wine than ordinary people.

That lack of self-control is not a vice is evident, then, although perhaps it is one in a way; for lack of self-control is contrary to deliberate choice, while vice is in accord with deliberate choice. Nevertheless, lack of self-control is similar to vice, at least, as regards their actions. It is like what Demodocus said about the Milesians:

129. *HA* 608a33–b18.
130. 1150a20–22.
131. 7.2.

The Milesians aren't stupid people
But they do precisely what stupid people do.[132]

In the same way, people who lack self-control are not unjust but will do unjust actions.

But since the person who lacks self-control is the sort who pursues bodily pleasures that are excessive and contrary to correct reason but not because he is persuaded that he should, while the intemperate person is persuaded, because he is the sort of person to pursue them, the person who lacks self-control is easily persuaded to change; an intemperate one isn't; for virtue preserves the starting-point, while depravity destroys it, and in actions what we do them for the sake of is the starting-point, just as hypotheses are in mathematics. (Reason, then, does not teach the starting-points either in the case of mathematics or in the present one. Instead, it is virtue, whether natural or habituated, that teaches correct belief about the starting-point.) The person who is of this sort is temperate and his contrary intemperate.

But there is a person who, because of feeling, is disposed to depart from and go contrary to correct reason, who is controlled by that feeling to the extent of not acting in accord with correct reason, but not so as to be the sort of person who is persuaded that he should pursue such pleasures freely. This is the person who lacks self-control; he is better than the intemperate person and is not unconditionally base; for the best thing is preserved in him: the starting-point. Another sort of person is contrary to this one. He is disposed to stand by and not depart from [correct reason]—at least, not because of feeling. It is evident from this, then, that the one state is excellent, while the other is base.

7.9
Self-Control

Is the self-controlled person one who stands by any reason whatsoever and any deliberate choice whatsoever or is it one who stands by the correct deliberate choice? And is someone lacking in self-control if he does not stand by any deliberate choice whatsoever or any reason whatsoever, or must it be a reason that is not false and a correct deliberate choice? This is the puzzle that was raised earlier.[133] Or is it coincidentally any reason or deliberate choice whatsoever, but intrinsically the true reason and the correct deliberate choice, that the one stands by and the other does not stand by? For if someone chooses or pursues this because of that, he pursues and chooses the second intrinsically but the first coincidentally. But what is intrinsic, we say, is **1151b1** unconditional. Therefore, in one way it is any belief whatsoever that the one stands by and the other departs from, but unconditionally it is true belief.

132. Fr. 1 West.
133. 1146a16–21.

There are some people who are the sort to stand by their belief, whom we call "stubborn"—the ones who are difficult to persuade into something and not easy to persuade out of it. These have some similarity to the self-controlled (just as the wasteful person does to the generous one, and the rash person to the confident one), but in many respects they are different. For it is by feeling and appetite that the self-controlled person is not moved, since he will be easily persuaded when occasion arises; while it is by reason that stubborn people are not moved, since they hold on to their appetites, of course, and many of them are led on by pleasures.

It is opinionated people, unlearned ones, and boorish ones who are stubborn. Opinionated ones are such because of pleasure and pain; for they enjoy being victorious if they are not persuaded to change their views and are pained if their own beliefs lose control, insofar as these are like decrees. As a result they are more like the person who lacks self-control than like one who has it.

There are some people, however, who do not stand by their beliefs, but not because of lack of self-control—for example, Neoptolemus in Sophocles' *Philoctetes*.[134] And yet it was because of pleasure that he did not stand firm, but it was a noble pleasure; for telling the truth was a noble thing to him, but he had been persuaded by Odysseus to lie. For not everyone who does something because of pleasure is intemperate, base, or lacking in self-control—only the one who does so because of a shameful pleasure.

But since there is also the sort of person who enjoys bodily pleasures less than one should and does not stand by reason, the person with self-control is a mean between this one and one who lacks it; for the person who lacks self-control does not stand by reason because of too much of something, this one because of too little. The one with self-control, by contrast, stands firm and does not change because of either. If indeed self-control is something excellent, both of these contrary states must be base, as they in fact appear to be. But because the other state is evident in only a few people and on rare occasions, the result is that just as temperance seems contrary only to intemperance, self-control seems contrary only to lack of self-control.

Since many things are called what they are by similarity, it is by similarity too that we have come to speak of the self-control of a temperate person; for both the self-controlled person and the temperate one are the sorts of people to do nothing contrary to reason because of bodily pleasures. But the former has base appetites, while
1152a1 the latter does not, and the latter is the sort not to feel pleasure contrary to reason, while the former is the sort to feel such pleasure but not be led by it.

Furthermore, the person who lacks self-control and the intemperate person are also similar; even though they are different, they both pursue bodily pleasures, but the latter actually thinks he should do so, while the former does not.

134. 1146a19.

7.10
Lack of Self-Control and Practical Wisdom

Nor is it possible for the same person to be at the same time practically wise and lacking in self-control; for it has been proved[135] that a person is at once practically wise and excellent in character. Further, a person is not practically wise by knowing alone but also by being a doer of the action, while the person who lacks self-control is not a doer of the action. (But nothing prevents the clever person from lacking self-control. That is why indeed some people are sometimes thought to be practically wise but lacking in self-control, because cleverness and practical wisdom differ in the way we described[136] in our initial account, that is, they are close as regards reason, but different as regards deliberate choice.) Nor, of course, is the person who lacks self-control like the one who knows something and is actively contemplating it, but like the one who is asleep or tipsy.

Also, he acts voluntarily (for in a way he acts knowing both what he is doing and for the sake of what), but he is not a wicked person; for his deliberate choice is decent. So he is half wicked. And he is not unjust; for he is not a plotter. For one sort of person who lacks self-control does not stand by the results of his deliberation, while the other, the passionate one, is not the sort to deliberate at all.

In fact, the person who lacks self-control is like a city that passes all the decrees it should and has excellent laws, but puts them to no use—as in Anaxandrides' jibe, "the city willed it, that cares nothing for laws." The wicked person, by contrast, is like a city that puts its laws to use but puts to use wicked ones.

Lack of self-control and self-control are concerned with what exceeds the state of ordinary people; for the latter stands firm more than most people are capable of doing, while the former does so less.

The sort of lack of self-control that is found in passionate people who act without self-control is more easily cured than the sort found in those who deliberate but do not stand firm, and those who lack self-control because of habituation are more easily cured than those whose lack of self-control is natural; for habit is easier to change than nature; for that is why this in fact is difficult to change, because it resembles nature, as Evenus too says:

> I say that habit's but long practice, friend,
> And this becomes men's nature in the end.[137]

We have now said what self-control is, what lack of self-control, what resilience, and what softness, and how these states are related to each other.

135. 1144ᵃ29–ᵇ1.
136. 1144ᵃ22–29.
137. Fr. 9 West.

7.11
Pleasure and Pain

Having a theoretical grasp on pleasure and pain is characteristic of the political philosopher; for he is the architectonic craftsman of the end we look to in calling each thing unconditionally "bad" or "good."

Further, it is actually a necessary requirement that we investigate them; for we posited[138] that both virtue and vice of character are concerned with pains and pleasures, and most people say that happiness involves pleasure. That is why a *makarios* ("blessed") person is so called, after *chairein* ("to enjoy").

In point of fact, it seems to some people that no pleasure is a good, either intrinsically or coincidentally (for the good and pleasure are not the same), while it seems to others that some pleasures are good but that many are base. Further, there is a third of these views, that even if every pleasure were a good, nonetheless it is not possible for the best good to be pleasure.

Generally speaking, then, it is not a good, because every pleasure is a perceived coming to be in the natural state,[139] but no coming to be is the same in kind as its end—for example, no process of building is the same in kind as a house. Further, the temperate person avoids pleasures.[140] Further, the practically wise person pursues what is painless, not what is pleasant. Further, pleasures impede thinking,[141] and the more we enjoy them, the more they do so—for example, sexual pleasure (for no one is capable of actively understanding anything in the midst of it). Further, there is no craft of pleasure,[142] and yet everything good is the work of some craft. Further, children and wild beasts pursue pleasures.

As for not all pleasures being excellent, it is because there are also pleasures that are actually shameful and objects of reproach, and because there are pleasures that are harmful (for some pleasant things cause diseases).

That pleasure is not the best good is because it is not an end but a coming to be.

These, then, are pretty much the things that are said.

7.12
Pleasure and Goodness

But that it does not follow from these arguments that pleasure is not a good—or even that it is not the best good—is clear from these next considerations.

138. 1104b13–28, 1105a10–16.
139. Plato, *Philebus* 54c–55a.
140. Plato, *Phaedo* 68c.
141. Plato, *Phaedo* 63d, 66b–c.
142. Plato, *Gorgias* 464b–465a.

First, since what is good is twofold (for one is unconditionally so, the other so for some person), natures and states will follow suit, and so also will movements and comings to be; and of those that seem to be bad some will be unconditionally bad, though not so for some person, but instead choiceworthy for him, while some are not so even for some person but are choiceworthy at a particular time and for a short period and not unconditionally. And some are not even pleasures but only appear to be—those that involve pain and are for the sake of a cure, for example, the ones sick people undergo.

Further, since one sort of good is an activity and another sort is a state, restorations to our natural state are only coincidentally pleasures. The activity in the case of the appetites belongs to the healthy remainder of state and nature, although there are in fact pleasures without pain or appetite, such as the activities of contemplation, where there is no lack in the natural state. A sign of this is that people do not enjoy the **1153^{a}1** same thing as pleasant while a lack in their natural state is being replenished as they do when it has been restored. Rather, when it has been restored, they enjoy things that are unconditionally pleasant, but when it is being replenished they enjoy even their contraries; for they enjoy even sharp and bitter things, none of which is either by nature pleasant or unconditionally pleasant. So the pleasures are not so either; for as pleasant things stand apart from each other, so also do the pleasures arising from them.

Further, it is not necessary for something else to be better than pleasure in the way that the end, some people say, is better than its coming to be; for pleasures are not comings to be nor do they all involve comings to be, but rather they are activities and an end, and they do not occur when we come to be something but when we use something. Also, not all pleasures have something else as end but only those that lead to the completion of our nature. That is why it is not correct to say that pleasure is a perceived coming to be, but rather say that it is activity of a natural state, and that it is unimpeded instead of perceived.[143] But it seems to some people to be a coming to be, because it is good in the strict sense; for they think an activity is a coming to be, while in fact it is a distinct thing.

To say that pleasant things are bad because some of them cause diseases is the same as saying that healthy things are bad because some of them are bad in relation to moneymaking. Both of them are certainly bad in the relevant respect, but they are not bad on account of this, at any rate, since even contemplation is sometimes harmful to health.

Neither practical wisdom nor any state at all is impeded by the pleasure specific to it but only by alien ones, since the pleasures arising from contemplation and learning will make us contemplate and learn all the more.

The fact that no pleasure is the work of a craft is what we would reasonably expect; for there is no craft of any other activity either, but only of the corresponding

143. $1153^{b}9$–12.

capacity—and yet the crafts of the perfumer and the gourmet chef do seem to be crafts of pleasure.[144]

As for the temperate person avoiding pleasure, the practically wise person pursuing a painless life, and children and wild beasts pursuing pleasure, all these are resolved in the same way. For since we have said in what way pleasures are good and in what way not unconditionally good,[145] it is the latter sort that both wild beasts and children pursue, and it is painlessness in the case of these that the practically wise person pursues. These are the ones involving appetite and pain, that is, the bodily ones (for they are of this sort) and their excesses, regarding which the intemperate person is intemperate. That is why the temperate person avoids these pleasures, since there are pleasures characteristic even of a temperate person.

7.13
Pleasure and Happiness

1153b1 Moreover, it is also agreed that pain is a bad thing, and something to be avoided; for one sort of pain is an unconditionally bad thing, while another is bad by being in some way an impediment. But the contrary of what is to be avoided—insofar as it is something to be avoided and bad—is a good. So pleasure must be a sort of good. For the resolution of this argument that Speusippus used to propose does not in fact resolve it, that it is just like the case of the greater being the contrary of the lesser and of the equal; for he would not say that pleasure is precisely something bad. And even if some pleasures are bad, nothing prevents a pleasure of some sort from being the best good, just as some science might be the best good[146] even if some sciences are bad.

And perhaps it is actually necessary that if there are indeed unimpeded activities of each state, no matter whether happiness is the activity of all of them or of one of them in particular, then this activity, insofar as it is unimpeded, is the most choiceworthy. But this is pleasure. So the best good might be some sort of pleasure, even if most pleasures turned out to be bad—even unconditionally bad.

It is because of this in fact that everyone thinks that the happy life is a pleasant one and reasonably weaves pleasure into happiness; for no activity is complete when it is impeded, and happiness is something complete. That is why the happy person needs to have goods of the body, external goods, and luck in addition, so that he will not be impeded in the corresponding ways. People who claim that the person who is broken on the rack or succumbs to great strokes of bad luck is happy provided that he is good are talking nonsense, whether voluntarily or involuntarily.

In fact, because the happy person needs the goods that luck brings in addition, some people think that good luck is the same as happiness. But it isn't, since even

144. †*MM* 1206a26–31.
145. Reading πῶς . . . ἀγαθαὶ ἁπλῶς.
146. 1178b20–23, *EE* 1249b19–21.

good luck is an impediment when it is excessive, and presumably is no longer by rights called "good luck"; for the defining mark of good luck is determined by relation to happiness.

Also, the fact that all things—both wild beasts and human beings—pursue pleasure is an indication that pleasure is in some way the best good: "No claim comes altogether to naught that many folks spread. . . ."[147] But since the same nature or state neither is nor seems to be the best for all, neither do they all pursue the same pleasure, although all do pursue pleasure. And perhaps they are actually pursuing not the one they think or would say that they were pursuing but the same pleasure; for all things by nature have something divine in them. But the bodily pleasures have appropriated the name "pleasure," because we most often steer toward them and because all share in them. So, because these are the only ones people know, they think that they are the only pleasures.

It is also evident that if pleasure is not a good and an activity, it will not be possible **1154ᵃ1** for the happy person to live pleasantly; for what would he need it for, if indeed it is not a good, but it is even possible that the happy person live painfully? For pain is neither a bad thing nor a good one, if indeed pleasure is neither of these. So why would he avoid it? Nor indeed would the life of the excellent person be more pleasant, if his activities were not so too.

7.14
Bodily Pleasures

But now, as regards the bodily pleasures, there is a question to be investigated by those who say that some pleasures at least are intensely choiceworthy (for example, the noble ones), but not the bodily ones (that is, the ones with which the intemperate person is concerned): why then is it that the contrary pains are bad? For good is contrary to bad.

Or are the necessary pleasures good in this way, that even what is not bad is good? Or are they good up to a point? For of some states and processes there cannot be an excess that is better, and so there cannot be an excess of the pleasure of them either, while of others there can be such an excess, and so there can be an excess of their pleasure too. Of the goods of the body, however, there can be an excess, and it is by pursuing the excess, not the necessary pleasures, that the base person is base; for everyone enjoys gourmet dishes, wines, and sex in some way, although not everyone does so in the way one should.

But it is contrariwise in the case of pain; for it is not just the excess that the base person avoids but pain generally; for pain is not contrary to the excess of pleasure except to the person who pursues excess.

147. Hesiod, *Works and Days* 763.

But since one must not only state the true view, but also the cause of the false one (for that contributes to our conviction; for when a reasonable explanation is given of why an untrue view appears true, this makes us more convinced of the true view), one must say why it is that bodily pleasures appear more choiceworthy.

Surely, the first reason is that bodily pleasure knocks out pain. Because of excessive pain, in fact, people pursue excessive pleasure, and bodily pleasure generally, as if it were a cure. But these cures become intense (which is why they are pursued) because they appear alongside their contrary.

(Indeed, pleasure seems to be no excellent thing, as we said,[148] because of the following two considerations. Some are the actions of a base nature—whether congenital, as with a wild beast, or by habituation, like the actions of base human beings. Others are cures for something lacking, and being in the good state is better than coming to be in it, but these occur in the process of coming to completion and so are **1154b1** coincidentally excellent.)

Further, bodily pleasures are pursued because of their intensity by people incapable of enjoying other sorts. At any rate, they contrive certain thirsts for themselves. When these are harmless, this is unobjectionable, although when they are harmful, it is base. For they have nothing else to enjoy, and besides, what is neither pleasant nor painful is painful to many people because of their nature. For an animal is always toiling, as the natural scientists also testify, claiming that seeing and hearing are painful. But we have already become habituated to them, as they say. Similarly, during their youth—because they are growing—people are in a condition that is like tipsiness, and so youth is pleasant. People who are naturally impulsive, on the other hand, are always in need of a cure; for even their body is constantly stinging them because of its mix, and so they are always in a state of intense desire. But pain is driven out both by the contrary pleasure and by any random one, provided it is a strong one. And it is because of these things that such people become intemperate and base.

Pleasures that do not involve pain, however, have no excess. These are among the things naturally and not coincidentally pleasant.

By "coincidentally pleasant things" I mean the curative ones; for being cured happens to coincide with a certain activity of the part of us that remains healthy,[149] and because of this it seems to be pleasant. By "things that are by nature pleasant," on the other hand, I mean those that bring about action in a healthy nature.

In no case, though, is the same thing always pleasant, because our nature is not simple but also has another element in it, in that we are mortals. So, if one of the two is doing something, it is contrary to the nature of our other nature, and when the two are equally balanced, what we are doing seems neither painful nor pleasant; since if the nature of some being is simple, the same action will always be most pleasant.

148. 1152b26–33.
149. 1152b35.

That is why the god always enjoys a single simple pleasure; for there is not only an activity of moving but also an activity of immobility, and pleasure is found more in rest than in movement.[150] "Change in all things is sweet," as the poet says,[151] because of a sort of defect; for just as a defective human being is an easily changeable one, a nature that needs change is also defective; for it is neither simple nor decent.

We have now discussed self-control and lack of self-control as well as pleasure and pain, and said what each of them is and in what ways some of them are good and others bad. It remains for us also to discuss friendship.

BOOK 8

1155ᵃ1

8.1
Views about Friendship

The next issue we should discuss is friendship; for friendship is a sort of virtue or involves virtue. Further, it is most necessary for living. For no one would choose to live without friends, even if he had all the other good things; for even wealthy people and those who are rulers or hold positions of power seem to need friends most; for of what benefit is such prosperity once the opportunity to be a benefactor—which occurs most and is most praiseworthy when it is toward friends—is removed? Or in what way could their prosperity be protected and safeguarded without friends? For the greater their prosperity is, the more precarious it is.

In poverty too, as in all other strokes of bad luck, people think friends to be their only refuge. Also, friends are necessary for young people with a view to the avoidance of error, for old ones with a view to being taken care of and being given aid with the actions they have to leave unaccomplished because of their weakness, and for those in their prime with a view to doing noble actions—for when "two go together"[152] they are better able both to understand and to do actions.

Also, friendship seems to be by nature present in parent for offspring and offspring for parent, not only among human beings but also among birds and most of the animals and among members of the same race toward each other—most of all among human beings (which is why we praise friends of humanity). Even on our travels, we can see how every human being is akin and friend to every other human being.

It also seems that friendship holds cities together and that legislators take it more seriously than justice; for concord seems to be something like friendship, and this is what they aim at most, while faction, because it is enmity, they most seek to drive out. Also, if people are friends, there is no need for justice, while people who are just

150. *Met.* 1072ᵇ24–30.
151. Euripides, *Orestes* 234.
152. Homer, *Iliad* 10.224.

need friendship in addition to justice. Also, of just things, the most just of all seems to be fitted to friendship.

Friendship is not only something necessary, however, but also something noble; for we praise those who love their friends, and many-friendedness seems to be something noble. And further, it is the same people we consider to be good men and friends.

There are, however, quite a few disputes about friendship. For some suppose that it is a sort of likeness and that those who are alike are friends. Hence the sayings, "like is drawn to like," "birds of a feather flock together," and so on. Others, on the contrary, say that people who are alike are proverbial potters to each other.[153]

1155b1 Also, concerning these issues, some people conduct their inquiry at a higher level and one that is more appropriate to natural science. Euripides says that "earth is in love with rain," when it has become parched, and that "the majestic heaven, when filled with rainwater, is in love with falling on earth."[154] Heraclitus too says that "opposition unites," that the noblest harmonies arise from discord, and that everything comes about through strife.[155] Others, on the contrary, including Empedocles, say that like seeks like.[156]

The puzzles of natural science we may set aside (for they do not properly belong to the present investigation). But those that concern human affairs and pertain to characters and feelings we must investigate—for example, does friendship come about among all sorts of people or is it impossible for depraved people to be friends? Also, is there one form of friendship or more than one? For some people think that there is one form, because friendship admits of differences in degree; but they have been convinced by an inadequate sign; for things that are distinct in form also admit of the more and less. But we have spoken about these earlier.[157]

8.2
The Objects of Love and Friendship

But perhaps these issues would become evident if we first come to know the object of love. For not everything is loved, it seems, but only the object of love, and this is either good, pleasant, or useful. But what would seem to be useful is that through which some good or some pleasure comes about, so that the objects of love as ends would be the good and the pleasant.

153. Hesiod, *Works and Days* 25.
154. Fr. 898 Nauck.
155. The first is part of B8 DK; the second may paraphrase B51; the third may paraphrase B80.
156. B22, 62, 90 DK.
157. 1.6.

Is it, then, the good that people love or the good for themselves? For sometimes these clash. It is the same way where the pleasant is concerned. It seems indeed that what each person loves is the good for himself, and that while the good is unconditionally an object of love, the object of love for each person is the good for himself; but in fact each loves not the real good for himself, but rather the apparent one. But that will make no difference; for it will be the apparent object of love.

These three being the things because of which people love, the way of loving that is appropriate for inanimate objects is not called "friendship"; for there is no reciprocal loving involved and no wish for the object's good (for it would presumably be ridiculous for someone to wish good things for his wine, but if indeed it happens, it is for its preservation that he wishes, in order to have it for himself). But for a friend, it is said, we must wish good things for his own sake. Those who wish good things for someone in this way, however, if the same wish is not reciprocated, are said to have goodwill toward him; for friendship is said to be reciprocated goodwill.

Or must we add "that does not go unawares"? For many have goodwill toward people they have never seen but take to be decent or useful, and one of the latter might feel the same way toward one of them. That these people have goodwill toward each other is evident, but how could we call them "friends" when they are unaware of how they are mutually disposed? Therefore, friends must have goodwill toward (that is, wish good things for) each other because of one of the things we mentioned,[158] and not be unaware of it.

8.3
Three Forms of Friendship

But these things differ in form from each other, therefore so also do the ways of loving and the friendships. There are, then, three forms of friendship, equal in number to the objects of love; for in each there is a corresponding way of reciprocal loving that does not go unawares, and those who love each other wish good things for the other in the way in which they love. Those who love each other because of utility do not love each other intrinsically, but only insofar as some good comes to them from each other. It is the same way with those who love because of pleasure; for they like witty people not for having a character of a certain sort but because they are pleasant to them.

Those who love because of utility, then, feel affection because of what is good for themselves, and those who love because of pleasure do so because of what is pleasant to themselves, and not insofar as the beloved is who he is but insofar as he is useful or pleasant.

158. 1155ᵇ19.

These friendships, then, are in fact coincidentally friendships; for a person who is beloved in that way is loved not insofar as he is precisely who he is but insofar as he provides some good, in the one case, or some pleasure, in the other.

Such friendships are prone to dissolve easily, then, because of the friends not remaining the same; for if they are no longer pleasant or useful, they stop loving. Utility, though, does not remain the same, but differs from time to time. When, then, the things because of which they were friends have been removed, the friendship breaks off as well, inasmuch as the friendship related to these things.

This form of friendship seems to come about among older people most of all (for at that age it is not pleasure they pursue but what is beneficial), also among those in their prime or youth who pursue what is advantageous. But such people scarcely ever live together; for sometimes they are not even pleasant people. Nor, then, do they need this sort of social interaction unless the people are advantageous; for they are pleasant only to the extent that they have an expectation of some good. It is among these friendships that people also put guest-friendship.

Friendship between young people seems to exist because of pleasure; for they live in accord with their feelings and pursue most of all what is pleasant for themselves and present at hand. But as they grow older their pleasures also become different. That is why they quickly become friends and quickly stop being so; for the friendship changes along with what is pleasant, and that sort of pleasure changes quickly. Also, young people are prone to sexual desire; for sexual friendships are largely in accord with feeling and exist because of pleasure. That is why they love and quickly stop loving, often changing in a single day. But they do wish to spend their days together and to live together; for that is how they get what is in accord with their friendship.

Complete friendship, however, is the friendship of good people who are alike in virtue; for each alike wishes good things for the other insofar as he is good, and each is intrinsically good. And those who wish good things for their friends for their friends' sake are friends most of all; for it is because of themselves and not coincidentally that they are disposed in this way. Their friendship, then, lasts as long as they are good—and virtue is something stable. Also, each of them is unconditionally good and is so for his friend; for good people are both unconditionally good and beneficial for each other. They are likewise pleasant as well; for good people are both unconditionally pleasant and pleasant for each other; for his own actions, and those similar to them, are pleasurable for each, and the actions of good people are the same or similar.

This sort of friendship is with good reason stable; for it joins together within it all the qualities that friends should have. For every sort of friendship exists because of some good or because of pleasure, whether unconditionally or for the person loving, and is in accord with some likeness between the parties. But to this sort of friendship all the qualities we mentioned belong, because of the friends themselves; for they are similar in this way,[159] and the rest. Also what is unconditionally good is also

159. Reading ταύτῃ γὰρ ὅμοιοι.

unconditionally pleasant, and these most of all are objects of love. Loving, then, and friendship too, exist most and at their best between people like these.

Friendships like these are likely to be rare, however; for there are few such people. Furthermore, time and intimacy are needed in addition; for as the proverb says, people cannot know each other until they have eaten the canonical amount of salt together.[160] They cannot accept each other, then, or be friends either until each appears as an object of love to the other and gains his trust.

Those who quickly do for each other things fitted to friendship, on the other hand, wish to be friends, but are not friends unless they are also objects of love and know this; for though the wish for friendship comes about quickly, friendship does not.

8.4
Comparisons between the Forms of Friendship (1)

So this form of friendship is complete both as regards time and as regards the rest, and in all of them each party gets the same or similar things from the other, which is precisely what should happen between friends.

The friendship that exists because of pleasure bears a similarity to the complete form of friendship; for good people are also pleasant to each other. It is the same way with the sort that exists because of utility; for good people are also useful to each other. And between these sorts of friends, friendships are also most lasting when the parties get the same thing—for example, pleasure—from each other, and not only that but also get it from the same thing, as happens with witty people, for example, and not as with a lover and his boyfriend. For these do not take pleasure in the same things, but one takes pleasure in looking at the other, while the other takes pleasure in being taken care of by his lover. As the boy's bloom fades, however, sometimes the friendship also fades (for the lover does not take pleasure in seeing the boy, and the boy does not get taken care of by his lover). On the other hand, many do remain friends, if as a result of their intimacy they come to feel affection for each other's character, having similar characters themselves.

Those who exchange not pleasure but utility in their sexual friendships are and remain friends to a lesser degree. Those who are friends because of utility break off their friendship as soon as the advantage is at an end; for it was not to each other that they were friends but to gain.

Because of pleasure and because of utility, in fact, even base people can be friends with each other, as can decent people with base ones, and ones who are neither bad nor decent with a person of any sort whatever. But it is clear that only good people

160. *EE* 1238^{a}2–3.

can be friends because of themselves; for bad ones find no enjoyment in each other unless some benefit might come about.

Also, the friendship of good people is the only sort that is immune to slander; for it is not easy to trust anyone about a person we have ourselves put to the test over a long period of time. Also, there is trust between them, and the conviction that "he would never do an injustice," and all the other things required in a true friendship. But in the other sorts of friendship there is nothing to prevent things like these from happening.

For since people call "friends" even those who are such because of utility, just as they do with cities (for alliances come about between cities for the sake of what is advantageous), and also apply it to those who feel affection for each other because of pleasure (just as in the case of children), presumably we too should call such people "friends," while saying that there are more forms of friendship than one. Friendship in the primary and strict sense is that between good people insofar as they are good, while the rest are friendships by similarity to it; for it is insofar as there is something good in their relationship, or some similarity between them, that they are friends; for what is pleasant is also good to lovers of pleasure.

The latter sorts of friendship are scarcely ever joined together, nor do the same people become friends because of utility and because of pleasure; for things that are coincidental to a subject are scarcely ever coupled.

1157b1 With friendships divided into these forms, base people will be friends because of pleasure or because of utility, since that is the respect in which they are alike. But good people will be friends because of themselves; for they will be friends insofar as they are good. They are friends unconditionally, then, while the others are friends coincidentally and by similarity to these.

8.5
Friendship as Activity and as State

Just as with the virtues, where some people are called "good" with regard to a state, others with regard to an activity, so it is with friendship too; for the ones who live together find enjoyment in each other and provide the requisite good things. The ones who are asleep or in separate places, on the other hand, though not actively doing them, have the state that would result in their doing the things fitted to friendship; for separate places do not break off friendship unconditionally but rather its activity. But if the absence goes on for a long time, it seems to make people forget even their friendship—hence the saying, "many a friendship has broken off for want of conversation."[161]

Neither older people nor sour-tempered ones seem fitted for friendship; for there is little pleasure to be found in them, and no one can spend his days with what is

161. Source unknown.

painful or with what is not pleasant; for it is evident that nature most avoids what is painful and seeks what is pleasant. People who approve of each other yet do not live together seem to have goodwill rather than friendship. For nothing is so fitted to friendship as living together (for while people who are in need desire benefit, even the blessed desire to spend their days together; for a solitary life suits them least of all). But passing the time with each other is not possible for people who are not pleasant and do not enjoy the same things, which is precisely what companionate friendship seems to involve.

The friendship of good people is most of all friendship, as we have often said; for the unconditionally good or pleasant seems to be an object of love and a choiceworthy thing, and to each person it is what is good or pleasant for him that seems to be such; and the good person is such to another good person on both grounds.

Loving seems to be a feeling, while friendship seems to be a state; for loving seems to be no less directed toward inanimate things. But reciprocal loving involves deliberate choice, and deliberate choice stems from a state. Also, when people wish good things for their beloveds for their beloveds' own sake, that they do so is not in accord with a feeling but with a state. Also, in loving their friend they love what is good for themselves; for the good person, in becoming a friend, becomes a good for the person for whom he is a friend. Each of the two, then, both loves what is good for himself and makes an equal return in the good he wishes and in what is pleasant (for friendship is said to be equality), and it is most of all in the friendship of good people that these qualities are found.

8.6
Comparisons between the Forms of Friendship (2)

Among sour-tempered or older people, friendship less often comes about, insofar as they are disagreeable and find less enjoyment in social interaction; for these are the qualities that seem to be most fitted to friendship and productive of it. That is why young people become friends quickly, while older ones do not (since people do not become friends with those they find no enjoyment in); and similarly neither do sour-tempered ones. But such people can have goodwill toward each other; for they wish each other good things and meet each other's needs. But they are scarcely friends, because they do not spend their days together and do not find enjoyment in each other—which are precisely the things that seem most fitted to friendship. **1158ª1**

To be a friend to many people, however, in a way that accords with complete friendship, is not possible, just as it is not possible to be in love with many people at the same time (for sexual love toward many people is like an excess, and something of that sort naturally comes about in relation to a single person). And it is not easy for many people to please the same person intensely at the same time, nor, presumably, for them to be good. Besides, he must actually acquire experience of them and

become intimate with them, which is very difficult. If, however, the friendship exists because of pleasure or because of utility, it is possible for someone to please many people; for there are many people of the sort that are satisfied this way, and the services involved take little time.

Among these, the one that exists because of pleasure is more like friendship, when both parties get the same things from each other and find enjoyment in each other, or in the same things. The friendships of young people are like this; for the element of generosity is found more in these. The sort that exists because of utility, by contrast, is characteristic of businesslike people. Also, blessed people, though they have no need of useful friends, do need pleasant ones; for they wish to have people to live together with, and, while they can bear what is painful for a short time, no one could withstand even the good itself continuously, if it were painful to him. That is why they seek friends who are pleasant. But presumably they should seek such as are also good—and further, good for them; for that way they will have everything that friends must have.

People in positions of authority appear to make use of distinct groups of friends; for some are useful and others pleasing, while the same people are scarcely ever both; for they do not seek friends whose being pleasant involves virtue, or who are useful with a view to noble actions, but rather witty people if it is pleasure they aim at, or those, on the other hand, who are clever at doing the actions prescribed, and these qualities are scarcely ever found together.

Although we did say that the excellent person is both pleasant and useful at the same time, still that sort of person does not become a friend to a superior unless the latter is superior in virtue too (otherwise he does not achieve proportional equality as an inferior). But superiors like that are scarcely ever found.

1158b1 The sorts of friendships we have discussed are based on equality; for both parties get the same and wish the same for each other, or trade one thing for another—for example, pleasure for benefit. But that these are both lesser friendships and less lasting ones, we have already said. Because of their similarity and dissimilarity to the same thing, indeed, they seem both to be and not to be friendships; for insofar as they are similar to friendship in accord with virtue they are apparently friendships (for one of them involves pleasure and the other utility, and friendship in accord with virtue also involves these), but insofar as friendship in accord with virtue is immune to slander and stable, while these sorts change quickly, and differ from it in many other ways, they are apparently not friendships, because of their dissimilarity to it.

8.7
Friendships between Unequals

A different form of friendship, however, is the one in accord with superiority—for example, of a father for his son, of older for younger generally, of man for woman, and of any sort of ruler for someone he rules. But these also differ from each other;

for the friendship of parents for children is not the same as that of ruler for ruled, but neither are those of father for son and son for father, or those of man for woman and woman for man. For of each of the parties involved there is a different virtue and a different work—different too are the things because of which they love. So the ways of loving and the friendships are also different.

Each, then, does not get the same things from the other and should not seek them either. But when children render to their parents what should be rendered to begetters, and parents render to their children what should be rendered to offspring, the friendship of such people will be stable and decent. In all friendships in accord with a superiority, however, the loving should be proportional too—for example, the better person should be more loved than loving, as should the more beneficial one, and similarly in each of the other cases; for when loving is in accord with worth, a sort of equality comes about, and that seems to be characteristic of friendship.

The equal does not seem to be the same in matters of justice and in friendship; for in matters of justice, equality is primarily equality in worth and secondarily equality in quantity, while in friendship, equality is primarily equality in quantity and secondarily equality in worth. This is made clear when a great disparity in virtue, vice, resources, or something else comes about; for then the parties are no longer friends and do not even claim that they deserve to be. This is most evident in the case of the gods; for they are the most superior to us in all good things. But it is also clear in the case of kings; for people who are much inferior to them do not claim that they deserve to be their friends either, nor do worthless people claim that they deserve to be friends with the best or wisest ones. In cases like this there is no exact definition of the point up to which people can remain friends; for much can be taken away and the friendship will still last, but if the separation is large—for example, between us and a god—it no longer does.

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And from this the puzzle arises as to whether friends really wish the greatest of goods for their friends (for example, that they be gods); for then they will no longer be friends to them, and hence not good things for them either; for friends are good things. If, then, we were correct to say that one friend wishes good things for the other for the other's own sake, it should be the case that the other remains whatever sort of thing he is. It is for him insofar as he is a human being, then, that he will wish the greatest goods. But perhaps not all of them; for it is most of all for himself that each person wishes good things.

8.8
Comparisons between the Forms of Friendship (3)

Ordinary people, because of their love of honor, seem to wish to be loved more than to love. That is why ordinary people love flattery; for a flatterer is a friend who is inferior, or pretends to be so, and to love more than he is loved. Being loved seems close to being honored, which is, of course, what ordinary people aim at.

It does not seem to be because of itself, however, that they choose honor, but rather coincidentally; for ordinary people enjoy being honored by those in positions of authority because of what they expect (for they think that if they need something, they will get it from these). It is as a sign of benefits to be received, then, that they enjoy the honor. Those who desire honor from decent and knowledgeable people, on the other hand, are aiming to confirm their own beliefs about themselves. What they enjoy, then, is that they are good, and that happens thanks to their trusting the judgment of those who say this. Being loved is something people intrinsically enjoy. That is why being loved would seem to be better than being honored, and friendship to be intrinsically choiceworthy.

But friendship seems to consist more in loving than in being loved. A sign of this is that it is in loving that mothers take enjoyment; for mothers sometimes give away their own children to be reared by others, and though they love them (knowing who they are), they do not seek reciprocal love (if love in both directions is impossible). Instead it seems enough for them to see that their children are doing well, and they themselves love their children even if these render up none of the things appropriate to a mother because of their ignorance.

Since friendship consists more in loving, however, and those who love their friends are praised, loving seems to be the virtue characteristic of friends, so that it is those in whom loving comes about in accord with worth who are stable friends and have a stable friendship. It is in this way that even unequals will best be friends; for in this way they would be equalized.

Equality and likeness is friendship, and most of all the likeness of those who are alike in virtue; for being stable in themselves, they also remain stable in relation to each other, and they neither need base services nor provide such services themselves, but even (one might almost say) prevent them; for it is characteristic of good people neither to commit errors themselves nor to allow their friends to do so. Depraved people, by contrast, do not have stability; for they do not remain even like themselves. Instead, they become friends for a short time, while they are enjoying each other's depravity.

Useful and pleasant people last longer as friends; for they do so for as long as they provide each other with pleasures or benefits. The friendship that exists because of utility, however, seems to come about most of all from contraries—for example, of poor for rich, or unlearned for knowledgeable; for whatever someone needs he seeks, giving something else as a present in return. Here we might also include lover and boyfriend, and beautiful and ugly. That is why lovers also sometimes appear ridiculous by thinking that they deserve to be loved in the same way as they love. If they are objects of love in a similar way, then, presumably they must think that they deserve this, but when they are nothing of the sort, it is ridiculous to do so.

Perhaps a contrary does not intrinsically desire its contrary, however, but rather does so coincidentally, and the desire is instead for the mean; for this is something good—for example, for what is dry the good is not to become wet but rather to reach

the mean, and similarly for what is hot and the rest. We may set aside these issues; for they in fact belong to another discussion entirely.[162]

8.9
Friendships in Different Communities

It does seem, as was said[163] at the start, that friendship and justice are about the same things and between the same people. For in every community there seems to be some sort of justice and some sort of friendship as well. At any rate, people address their fellow sailors or fellow soldiers as friends, and those in other sorts of communities do likewise. And the extent to which they share things communally is the extent of their friendship; for it is also the extent of justice. The proverb, "what friends have they have in common" is correct too; for it is in community that friendship lies.

But while brothers and companions have everything in common, others have only specified things—more in some cases, less in others; for some friendships are in fact greater in extent, others less. What is just differs too; for it is not the same for parents toward children as for brothers toward each other or the same for companions as for fellow citizens, and similarly in the case of the other sorts of friendships as well.

Injustice toward each of these, then, is also different, and grows when it is toward those who are more fully friends—for example, it is a more terrible thing to rob a companion of his money than to rob a fellow citizen, or not to give aid to a brother than not to give it to a stranger, or to strike one's father than to strike anyone else at all. Justice too naturally increases along with the friendship, as it is between the same people and has an equal extension.

All communities seem to be parts of the political community, however; for people consort together for some advantage and to provide themselves with something for their life. And the political community too seems both to have come together at the start and to remain in existence for the sake of what is advantageous; for legislators also aim to hit this, and what is for the common advantage is said to be just.

Other communities seek what is advantageous in some area—for example, sailors aim at what is advantageous on a voyage related to some moneymaking occupation or something of that sort, while fellow soldiers seek what is advantageous in war, whether money, victory, or taking a city; and similarly with members of tribes or demes. Some communities seem to come about because of pleasure, such as religious guilds and dining clubs; for these come about for the sake of sacrifices and companionship. All of these, however, seem to be subordinate to the political community; for it seeks not the advantage that is present at hand but the one that is for all of life {. . .}[164] performing sacrifices, arranging gatherings related to these, giving honors to

162. 1155^{b}1–9.
163. 1155^{a}22–28.
164. There is a lacuna in the text at this point.

the gods, and providing pleasure-involving relaxations for themselves. For ancient sacrifices and gatherings seemed to take place after the harvesting of the crops, as a sort of offering of first fruits; for it was at these times that people were most at leisure.

All these, then, are manifestly parts of the political community, and the various sorts of friendship will follow along with these sorts of community.

8.10
Constitutions

There are three forms of constitution and an equal number of deviations—destroyed versions, as it were—of these. The forms of constitution are kingship, aristocracy, and, thirdly, one based on property assessments, which it seems proper to call "timocracy," though most people usually call it a "polity."

Among these, the best is kingship, the worst timocracy. The deviation from kingship is tyranny; for though both are monarchies, they differ greatly; for the tyrant targets his own advantage, the king that of the ones he rules. For a person is not a king unless he is self-sufficient and superior in all good things, and the one like that needs nothing in addition and so would not target what benefits himself but what benefits those he rules; for the one who is not like this would be some sort of titular king. Tyranny is contrary to this; for the tyrant pursues what is good for himself. Also, it is more evident in its case that it is the worst, and the worst is what is contrary to the best.

There is constitutional change from kingship to tyranny; for the baseness characteristic of monarchy is tyranny, and a depraved king becomes a tyrant. There is change from aristocracy to oligarchy due to the vice of the rulers, who allocate what belongs to the city contrary to worth, giving all or most of the good things to themselves and offices always to the same people, considering the acquisition of wealth to be their most important concern. The rulers are few, then, and depraved people rather than the most decent ones. There is change from timocracy to democracy; for these are neighbors; for timocracy too is meant to be rule by the majority, and all those meeting the property assessment are equal. Democracy is least depraved; for it deviates only a little from the form of polity. Constitutions change, then, most of all in these ways; for these changes are smallest and easiest.

Resemblances—and, as it were, paradigms—of these constitutions can also be found in households. For the community of a father in relation to his sons takes the shape of a kingship; for it is for his children that a father cares; that is why Homer too calls Zeus "father"; for kingship is meant to be paternal rule. Among the Persians, however, the rule of a father is tyrannical; for they use their sons as slaves. Also tyrannical is the rule of a master in relation to slaves; for it is the advantage of the master that is served in it. But while this form of rule is apparently correct, the Persian form is apparently erroneous; for when the people ruled are different sorts, the rules are different.

The community of man and woman is apparently aristocratic; for the man rules in accord with worth and in those matters in which a man should rule, while whatever is fitting for a woman he gives over to her. If on the other hand the man controls everything, he changes it into an oligarchy; for he makes it contrary to worth and not insofar as he is better. Sometimes women rule because they are heiresses. Their rule, then, is not in accord with virtue but exists because of wealth and power, as in oligarchies.

The community of brothers is like a timocracy; for brothers are equals except insofar as they differ in age. That is why if their ages differ greatly, their friendship is no longer a brotherly one. Democracy, however, is found most of all in master-less habitations (for there everyone is on an equal footing), and in those in which the ruler is weak and everyone has authority.

8.11
Friendships in Different Constitutions

In each of the constitutions there is manifestly friendship to the extent that there is justice. The friendship of a king toward those he rules is in accord with his superiority as a benefactor; for he treats those he rules well, if indeed he is good, and supervises them to ensure that they do well, just as a shepherd does his sheep; hence Homer also calls Agamemnon "shepherd of the people."

Paternal friendship is also like this, but differs in the magnitude of the benefactions; for a father is a cause of existence (which seems to be the greatest service) as well as of nurture and education. And these services are attributed to ancestors too. It is by nature, moreover, that a father is fit to rule his sons, ancestors to rule descendants, and a king those he rules.

These friendships are in accord with superiority, which is also why parents are honored. What is just, then, in these relationships is not what is the same for the two parties but rather what is in accord with their worth; for the friendship is that way too.

Also, the friendship of a man for a woman is the same as in an aristocracy; for it is in accord with virtue, with a superior good going to the better and what is fitting going to each. And what is just is that way too.

The friendship of brothers is like companionate friendship; for they are equals and of an age, and people like that are for the most part similar in feelings and character. The friendship that accords with timocracy is like this too; for the citizens are meant to be equal and decent, ruling in turn and on equal terms. Their friendship, then, is that way too.

In the deviations, however, just as justice is found only to a small extent, so too is friendship, and it is found least in the worst one; for in tyranny there is little or no friendship. For in cases where there is nothing in common between ruler and ruled,

there is no friendship; for there is no justice either; for example, of craftsman toward instrument, soul toward body, or master toward slave. Benefited by their users all these things certainly are, but there is no friendship toward inanimate things nor justice either. Neither is there friendship toward a horse or a cow, or toward a slave insofar as he is a slave. For there is nothing in common between the parties; for a slave is an animate instrument, an instrument an inanimate slave. Insofar as he is a slave, then, there is no friendship toward him, but insofar as he is a human being there is; for there seems to be some sort of justice on the part of any human being toward anyone capable of participating in a community of law and convention, and of friendship too, then, to the extent that he is a human being.

There are friendships and justice to a small extent even in tyrannies, then, while in democracies they are found to a greater extent; for in the case of those who are equal, the things they have in common are many.

8.12
Friendships in Families

It is in community, then, that every friendship lies, as we said.[165] But we might distinguish the cases of familial and companionate friendship. Political friendships, by contrast, as well as tribal friendships, friendships between fellow sailors, and all friendships of this sort do seem to be more like communal ones; for they seem to be in accord with some sort of agreement. Guest-friendship might also be ranked with these.

Familial friendships also seem to be of many forms, although all derive from paternal friendship; for parents feel affection for their children as being something of themselves, and children feel it for their parents as being those they come from. But parents know better what has come from them than their offspring know that they have come from these. Also, the source from which it comes is more intimately related to the offspring than what comes to be is to what produced it; for what comes from something properly belongs to what it comes from (as a tooth or hair or whatever else does to what has it), while what something comes from does not properly belong to it at all, or does so to a lesser extent. Also, there is the quantity of time involved; for parents feel affection for their offspring straight from birth, while children feel it for parents when time has passed and they have acquired comprehension or perception. From these observations it is also clear why mothers love their children more.

Parents love their children, then, as they love themselves; for what has come from them is like another (by being separated from them) "themselves," and children love parents as being what brought them into the world. Brothers love each other as having

165. 8.9.

been brought into the world by the same parents; for because their relationship to their parents is one and the same, they become one and the same too. Therefore, we speak of "one and the same blood," "one and the same root," and the like. They are one and the same in some way, then, even though divided.

Joint nurture and being of an age are major factors in friendship; for "age makes for fellowship," and those who live intimately become companions. That is also why fraternal friendship and companionate friendship are similar. And cousins and other relatives derive their intimate attachment from that of brothers; for it exists because they come from the same ones. But some are more intimate and others more distant, depending on their closeness to or distance from their initial common ancestor.

The friendship of children toward parents, as of human beings toward gods, is as toward something good and superior; for they are the producers of the greatest goods and the cause of their existence and nurture as well as of their education, once born. And this form of friendship also includes pleasure and utility more than does the friendship of strangers, insofar as they have more of a common life.

Fraternal friendship has the features found in companionate friendship (most of all when the parties are decent, and generally when they are similar to one another) to the extent that brothers are closer kin to each other and feel affection for each other from birth, and to the extent that those who come from the same parents and have been jointly nurtured and similarly educated are more similar in character and their test of each other over time is longest and most certain. And among other relatives the features fitted to friendship are also proportional.

Between a man and a woman, friendship seems to hold by nature; for a human being seems to be by nature more couple-forming than political to the extent that household is prior to and more necessary than city, and reproduction is a characteristic more common to animals. With the other animals, their community only goes as far as reproduction, while human beings share a household not only for the sake of reproduction but also for the sake of various things necessary for life; for from the outset their works are divided, those of a man being different from those of a woman, so they assist each other by putting their special works into the common enterprise. Because of this, both utility and pleasure seem to be found in this form of friendship. It may also exist because of virtue, however, if both parties are decent; for there is a virtue characteristic of each, and they can enjoy something like this. And children seem to be a bond of union, which is why childless unions are more quickly dissolved; for children are a good common to both, and what is common holds things together.

As for how a man must live his life in relation to a woman, and generally speaking a friend in relation to a friend, there is apparently no difference between inquiring about this and inquiring about how to do so justly; for this is not the same, apparently, for a friend toward a friend as toward a stranger, a companion, or a classmate.

8.13
Complaints in Friendships in Accord with Equality

There are three sorts of friendship, as we said[166] at the start, and in each, some are friends in accord with an equality while others are so in accord with a superiority (for similarly good people become friends as do better ones and worse ones, and it is likewise with pleasant people too and those who become friends because of utility, who may be equal or different in the benefits they confer). Equal partners, then, must equalize their loving and everything else in accord with equality, while unequal ones must return what is proportional, given the sorts of superiority involved.

Complaints and grievances arise only or mostly in friendships that are in accord with utility, and reasonably so. For those who are friends because of virtue are eager to provide benefits for each other (for this is characteristic of virtue and friendship), and when that is what people are competing about, there can be no complaints or quarrels; for no one is repelled by someone's loving him or providing benefits for him, but rather insofar as he is a sophisticated person, he responds by providing benefits in turn. And the one who excels the other does not complain about his friend, because he gets what he is seeking; for each desires what is good.

Complaints scarcely ever arise, either, in friendships that exist because of pleasure; for what both parties desire they get at the same time, if they enjoy passing the time together. And a person who complained about someone who did not delight him would appear ridiculous, when he is free not to spend his days with him.

Friendship that exists because of utility, however, is prone to complaints; for since they are making use of each other for their own benefit, they always need more, thinking that they have less than is fitting, and raising a grievance that they are not getting as much as they need, though they claim that they deserve it. Those who are providing the benefits, on the other hand, are unable to provide as much as the recipients need.

It seems that just as justice is twofold, one sort unwritten and the other in accord with the law, so in the case of friendship in accord with utility, one sort is based on character and the other sort is legal. Complaints most arise, then, when the partners do not begin and dissolve their association in accord with the same sort of this friendship.

The sort that is legal is one on specified terms; one sort altogether consists in businesslike hand-to-hand exchange, the other is freer as to time, albeit based on a quid-pro-quo contract. In the latter, the debt is clear and not disputable, but the deferral of repayment is fitted to friendship. That is why in some places there cannot be judicial proceedings over these, but rather people think that those whose transactions were based on trust should be content with that.

166. 1156a6–7.

The sort that is based on character is not one on specified terms, but rather each gives a gift or whatever as to a friend, yet the giver claims that he deserves to get back an equal amount or more, on the supposition that he was not giving but making a loan.

In a case where one party does not begin and dissolve the association on the same terms, there will be complaint. (This happens because all or most people, while they wish for what is noble, deliberately choose what is beneficial. And while it is noble to provide a benefit not because it will be repaid, it is being the recipient of a benefaction that is beneficial.) **1163^{a}1**

If the recipient can, then, he must make a return of equal worth to what he has received and do so voluntarily (for he must not make the other party an involuntary friend). He must suppose, then, that he was in error at the start and received a benefit from someone he should not have received it from; for it was not from a friend or from someone doing it because of itself. And he must dissolve the association as if the benefaction had been provided on specified terms and agree that he would make repayment when he is able. But if he is unable, not even the giver would claim he deserves it. So if it is possible, he must repay. And at the start he must investigate from whom he is receiving benefactions and on what terms, so that he may either accept them on those terms or not.

It is disputable whether one should measure by the benefit to the recipient and make repayment in accord with that or measure by the beneficence of the giver. For recipients say that they got from the benefactors the sorts of things that were small things for the benefactors and that they could have gotten them from someone else—minimizing the matter. The givers, conversely, say they were the biggest things for them, could not have been gotten from others, and were given in times of danger or of similar sorts of need.

Is it, then, the recipient's benefit that is the measure of it when the friendship exists because of utility? For he was the one in need of it, and the giver assists him on the supposition that he will get an equal return. The assistance, then, has been precisely as much as the recipient has been benefited, and the recipient must repay, then, as much as he got out of it—or even more; for that is nobler.

In friendships in accord with virtue, on the other hand, there are no complaints. Rather, the measure would seem to be the deliberate choice of the giver; for the controlling element of virtue and character lies in deliberate choice.

8.14
Complaints in Friendships in Accord with Inequality

Disputes also arise in friendships in accord with a superiority; for each of the two parties claims that he deserves to have more, and when this happens the friendship is dissolved. For the better party thinks it appropriate that he have more; for more is

allocated to the one who is good. And the partner who confers greater benefits thinks similarly; for a useless person, they say, should not have an equal share; for then it becomes a charity and not a friendship, if what results from it is not in accord with the worth of the parties' works. For they think that just as in a community formed with a view to making money, where those who contribute more get more, so it should be in a friendship too. But the person in need, or the worse party, takes the converse position; for the work of the good friend is to assist those who are in need; for what, they ask, is the benefit of being the friend of an excellent person or one in a position of power if you are going to get nothing out of it?

It would seem that the thought of each party about his deserts are correct, and that more should be allocated to each of them from the friendship—not more of the same thing, however, but more honor to the superior party and more profit to the one in need; for honor is the reward appropriate to virtue and beneficence, while profit is the assistance appropriate to need.

It is apparently this way in constitutions as well; for the one who contributes nothing good to the community is given no honor; for what is communal is given to the one who benefits the community, and honor is something communal. For one cannot at the same time receive money from communal sources and receive honor. For no one endures getting the smaller share in everything. To the person who gets a smaller share of money, then, they allocate honor, and to the person willing to accept gifts, money; for what is in accord with worth equalizes and preserves the friendship, as we said.[167] This, then, is also how one must associate with unequals: the party who is benefited in regard to wealth or in regard to virtue must give honor in return, making what repayment he can.

For friendship seeks what is possible, not what is in accord with worth; for that is not even possible in all cases, such as in cases of honor to the gods or to parents; for here no one could ever make a return of equal worth, but the one who serves them as far as he can seems to be decent. That is why it would seem that a son is not free to disown a father, while a father is free to disown a son; for a debtor must repay, and since nothing a son has done is worthy of the benefits he has already received, he is always in debt. A creditor, however, is free to remit a debt, and so, then, is a father. At the same time, presumably, it seems that no one would disown a son who was not one utterly excessive in his depravity; for quite apart from their natural friendship, it is human not to reject assistance. For the son, however, if he is depraved, providing goods to his father is something to avoid or not take seriously; for while ordinary people wish to receive benefits, they avoid providing them on the supposition that they involve no gain.

So much, then, for our discussion of these issues.

167. Most recently at 1162b2–4, but also 1158b27–28, 1159a35–b2.

BOOK 9

9.1
Resolving Disputes That Arise in Friendship

In all friendships between people who are dissimilar, what is proportional equalizes and preserves the friendship, as we said.[168] For example, in political friendship the shoemaker gets a payment for his shoes in accord with their worth, and so does the weaver and the rest. In these cases, money is provided as a common measure, and so it is this, then, that everything is referred to and measured by.

In sexual friendships, however, the lover sometimes complains that while his own love is beyond measure, he is not reciprocally loved (even when, as it happens, he has nothing lovable about him), while the boyfriend complains that his lover had earlier promised everything but now delivers nothing. These sorts of things happen when the lover loves the boy because of pleasure, while the boy loves him because of utility, and they do not both provide these. For when a friendship exists because of these, it is dissolved when the things for whose sake they loved do not occur; for it was not the parties themselves who were the object of affection but their qualities, which were not stable. That is why such friendships are not stable either. But friendship of character, because it is intrinsic friendship, does endure, as we said.[169]

Disputes arise when the things the parties get are different and not what they desire; for it is like getting nothing at all when we do not get what we seek. Consider, for example, the man who promised a lyre player that the better he played the more he would get, but when dawn came and the lyre player asked for what the man had promised, the man said that he had given pleasure in return for pleasure. If this was what each of them had wished, that would have been enough. But if one wished for delight, the other for profit, and the one has what he wished for while the other hasn't, matters conducing to their community would not be correctly arranged; for it is what each person happens to need that he is in fact intent on—at any rate, it is for this that he gives what he does.

Which of them is to fix the worth: the one who gives first or the one who gets first? For the one who gives first would seem to turn it over to the other. This is precisely what they say Protagoras used to do; for whenever he taught anything at all, he used to invite the learner to assess how much the things he got to have scientific knowledge of seemed to be worth and accepted that amount. But in cases like this, some people prefer the saying, "to a man his wage."[170] It makes perfect sense that those who get the money first and then do none of the things they said they would do, because of the extreme nature of their promises, are subject to complaint; for they do not deliver

168. Most recently at 1163ᵇ11–12.
169. 1159ᵃ35–ᵇ7.
170. Hesiod, *Works and Days* 368.

what they agreed to. This, however, is what the sophists are presumably compelled to do, because no one would pay them money for what they do scientifically know. So they take the wage, do not do what they said, and—as makes perfect sense—get involved in complaints. But where there is no contract of services to be rendered, those who, because of the other parties themselves, give first are not subject to complaint, as we said[171] (for this is characteristic of friendship in accord with virtue). And the payment for it must be in accord with deliberate choice (for this is characteristic of a friend and of virtue). This, it seems, is also the way it must be when the parties have formed a community for the purposes of philosophy; for the worth of philosophy is not measured in money, nor would honor serve as its counterweight, but it is perhaps enough—as in the case of gods and parents—to do what we can.

If the giving is not of this sort but with a view to some return, presumably the return should ideally be one that each of them thinks to be in accord with worth. But if they do not agree on this, it would seem to be not only necessary but also just that the one who gets first should fix its worth; for if the giver got in return as much benefit as the receiver did, or as much as the receiver would have given for the pleasure, the giver would get a worthy return.

For in buying and selling, indeed, this is apparently what happens. And in some places there are laws prohibiting judicial proceedings in voluntary transactions, on the supposition that one should dissolve a community with someone one trusted in the same way as one formed it. For the law considers it more just for the person to whom something is turned over to fix its worth than for the person who turns it over to do so. For most things are not priced equally by those who have them and those who wish to get them; for to each party their own belongings and the things they give appear to be worth a lot. Nonetheless, payment is made in whatever amount is fixed by the ones who get them. But presumably the price should not be what a thing appears to be worth once the getter has it but the price he put on it before he had it.

9.2
Puzzles about the Demands of Different Friendships

Puzzles also arise in cases of the following sort. Whether, for example, a person should allocate everything to his father and obey him in everything or put his trust in a doctor when he is sick and elect as a general someone capable in warfare; or, similarly, whether he must do a service for a friend rather than for an excellent person and return a favor to a benefactor rather than do one for a companion, if he cannot do both.

All such matters are difficult to determine with any exactness, aren't they? For they involve all sorts of differences both in greatness and smallness and in nobility

171. 1162b6–13.

and necessity. But that one must not return everything to the same person is not unclear; and one must for the most part return benefactions rather than do a favor for a companion, just as one must repay a loan to the person to whom we owe it rather than give freely to one's companions. But presumably not even this is always so—for example, must someone who has been ransomed from pirates ransom his ransomer in return, whomever he is (or if the latter has not been captured but is asking to be paid, repay him), or must he ransom his father? For it would seem that one must ransom one's father rather than even oneself.

Precisely as we said,[172] then, speaking in universal terms, one must repay the debt, but if giving would greatly exceed repaying either in nobility or in necessity, one must incline toward that. For sometimes even the return of a previous service is not equal to it, when one party knows he is benefiting someone excellent, while the other would be returning it to someone he thinks is depraved. For sometimes one must not reciprocate by lending to someone who has lent to you; for he lent to you as someone who is decent, thinking he would be repaid, while you do not expect that you would be repaid by a wicked person. If the situation is truly like that, then, the worth of the parties is not equal. And even if it is not like that, but they think it is, what they do would not seem strange. Precisely as we have often said, then, accounts concerned with feelings and actions have the same determinateness as the things they are concerned with.

That one must not return the same things to everyone nor everything to one's father, just as one does not make all one's sacrifices to Zeus, is not unclear. And since different things are repaid to parents, brothers, companions, and benefactors, one must allocate to all what properly belongs to them and is fitting. And this is manifestly what people in fact do; for to weddings they invite their relatives; for these have a share in the family and so, then, in the actions that concern it. And funerals too, people think, should be attended by relatives more than anyone else, because of the same consideration.

It would seem that in matters of sustenance one should assist parents most, on the grounds of owing them this, and that it is a nobler thing to assist the causes of our existence in this way than to assist ourselves. And honor too, it would seem, one should give to parents just as to the gods—but not every sort of honor; for one should not even give the same honor to a father as to a mother (nor, again, as to the wise person or the general), but rather the paternal sort and the maternal sort respectively.

To all older people too one should give honor in accord with their age, by standing up, finding them a seat, and so on. With companions and brothers, on the other hand, one should be free speaking and share everything. And to relatives, fellow tribesmen, fellow citizens, and all the rest one must always try to allocate what properly belongs to them, and to make comparative judgments about the things accruing to each in accord with kinship, virtue, or use.

172. Most recently at 1164^{b}27–28.

The comparative judgment is certainly easier with people of the same kind and harder work with those of different kinds. Yet we must not abandon the task because of this, at any rate, but rather to the extent possible make such determinations as far as we can.

9.3
Puzzles about Dissolving Friendships

There is also a puzzle about whether or not to dissolve friendships with those who do not remain the same. Or is there, as regards those who are friends because of utility or pleasure, nothing strange if the friendships are dissolved when the friends no longer have the relevant qualities? For it was because of these qualities that they were friends, and when these depart, it is reasonable not to love. But someone might complain if a person who liked him because of utility or pleasure pretended to do so because of his character. For, as we said at the start, most differences arise between friends when the way in which they think they are friends is not the same as the way in which they are friends.[173]

When someone has deceived himself and supposed that he was being loved because of his character, although the other was doing nothing of the sort, he would hold himself responsible. But when he is deceived by the other's pretenses, he is justified in complaining about his deceiver—more so even than about those who counterfeit currency, inasmuch as the malice concerns something more estimable.

If one accepts another person as a friend for being good, however, and then he becomes depraved and seems so, must one still love him? Or is that not possible, if indeed not everything is an object of love, but rather the good? The wicked, by contrast, is neither an object of love nor should be one (for a lover of wickedness one must not be, nor must one become like the base person, and like, we said,[174] is friend to like). Must one, then, dissolve the friendship immediately? Or not in all cases but only when the friends are incurable in their depravity? If they do admit of rectification, one must aid them more with their character than with their property, inasmuch as that is a better thing and more properly belongs to friendship. The person who did dissolve such a friendship, however, would seem to be doing nothing strange; for it was not to a person of that sort that he was a friend. When his friend has changed, then, and he is unable to restore him to what he was, he leaves him.

But if the one friend remained the same while the other became more decent and greatly different in virtue, must the second treat the first as a friend? Or is that not possible? When the distance between them is large, the answer becomes most clear—for example, in childhood friendships; for if one friend remained a child in

173. Perhaps 1164a13–14, but nothing exactly like this has been said.
174. 1156b19–21, 1159b2–3.

thought, while the other became a man of the best sort, how could they be friends, when they are neither satisfied with the same things nor find the same things enjoyable or painful? For not even with regard to each other will this be so, and without it, as we saw, they cannot be friends; for they cannot share a life. We have talked about these things.[175]

Must one, then, behave no differently toward someone in a case like this than if he had never been one's friend at all? Surely, one should retain a memory of the former intimacy, and just as we think favors should be granted to friends rather than strangers, one must in the same way allocate something to former friends too, because of the former friendship, when the dissolution does not occur because of extreme depravity.

9.4
Friendship and Self-Love

1166ᵃ1 The features fitted to friendships toward neighbors, and those by which the various friendships are defined, seem to derive from the features of a person's friendship toward himself. For people take a friend to be someone who wishes and does what is good or what is apparently good for the sake of the other, or someone who wishes his friend to exist and live for the friend's own sake—precisely the way mothers feel about their children, and friends who are irritated with each other. And others take a friend to be someone who passes the time with his friend and makes the same choices as he does, or suffers and enjoys together with him—this also happens most with mothers. It is by one or other of these features that people also define friendship.

And each of these features is found in the decent person's relation to himself, and in that of all other people insofar as they suppose themselves to be decent (but, as we said,[176] virtue and the excellent person would seem to be the measure in each case); for this sort of person is of one mind with himself and desires the same things with all his soul, and wishes, then, what is good for himself and what appears good, and does the pertinent actions (for it is characteristic of a good person to work hard at what is good) and does it for his own sake (for he does it for the sake of the thinking part in him, which is precisely what each person seems to be). Also, he wishes himself to live and be preserved and most of all [the part of himself] with which he thinks. For existence is a good thing for an excellent person, and each person wishes the good things to himself. But no one chooses to have everything if it is by becoming someone other than himself (for even as things stand the god has the good). Rather, he chooses to have it while being whatever it is that he is. But each person would seem to be his understanding part, or it most of all.

175. 1157ᵇ17–24, 1158ᵇ33–35.
176. 1113ᵃ29–33.

And such a person wishes to pass the time with himself; for he does so pleasantly; for his memories of what he has done are agreeable and his expectations for the future are good, and memories and expectations like that are pleasant. His thought too is well supplied with objects of contemplation. And he, most of all people, suffers and is pleased together with himself; for it is always the same thing that is painful or pleasant, not different ones at different times; for he is (one might almost say) without regrets.

The decent person, then, has each of these features in relation to himself and is related to his friend as he is to himself (for his friend is another himself), and friendship seems to be [defined by] one or other of these features, and friends to be those who have them.

Whether there is or is not friendship toward oneself, however, is a question we may set aside for the present.[177] But, on the basis of the features we mentioned, there would seem to be friendship, insofar as a person is two or more things, and because the extreme of friendship resembles friendship toward oneself.

The features we mentioned, however, are apparently also found in ordinary people, base though they are. Is it, then, only insofar as they are satisfied with themselves and suppose themselves to be decent that they share in these? Certainly no one who is altogether base and impious in his actions has them or even appears to.

It is pretty much the case indeed that base people do not have them either; for they are at odds with themselves and, having an appetite for one lot of things, wish for another, the way people who lack self-control do; for instead of the things they themselves think to be good, they choose pleasant ones that are actually harmful, while others again, because of cowardice or idleness, shrink from doing the actions they think best for themselves. Those who have done many terrible actions because of their depravity hate and even flee from living, and[178] do away with themselves.

Besides, depraved people seek others with whom to spend their days but flee from themselves; for when they are by themselves they remember many repellent things and expect others like them in the future, while when they are with others they forget these. And since they have nothing lovable, they feel nothing that is a mark of friendship toward themselves. Neither, then, do people like this enjoy or suffer together with themselves; for their soul is torn by faction, and one element in it, because of its depravity, suffers at being held back from certain things, while the other is pleased, and so one pulls this way and the other that, as if tearing him asunder. And even if it is not possible to be pained and pleased at the same time, still, after a bit, he is pained that he was pleased and he wishes that these things had not become pleasant to him; for base people are full of regret.

The base person, then, is apparently not so disposed as to be fitted for friendship even toward himself, because he has nothing lovable. If, then, to be in that state is

177. 9.8.

178. Reading μισοῦσί τε καὶ.

to be utterly wretched, one must avoid depravity with all one's might and try to be decent; for that way one would both be fitted to friendship toward oneself and become friend to another.

9.5
Friendship and Goodwill

Goodwill seems to be fitted to friendship, but friendship it is surely not; for goodwill arises even toward people one does not know and without their being aware of it, while friendship does not. We also said this before.[179] Neither is goodwill even a way of loving. For it does not include intensity of feeling or desire, while in the case of loving these do follow along. Also, loving involves intimacy, while goodwill can arise all of a sudden—as it does, for example, toward athletic contestants; for people come to have goodwill for them and to share in their wishes, but would never join in their actions; for people come to have goodwill all of a sudden, precisely as we said, and to feel an affection that is superficial.

Goodwill seems, then, to be a starting-point of friendship, just as the pleasure from sight is the starting-point of sexual love; for without first being pleased by the appearance of the other, no one falls in love, but someone who does enjoy another's appearance is none the more in love unless he also longs for the other when he is absent and has an appetite for his presence. In the same way too, then, it is not possible for people to be friends without first having goodwill, but those who have goodwill are none the more friends; for they only wish good things to those for whom they have goodwill, but would never join in their actions or go to any trouble on their behalf. Hence, by transference of the term, we might say that goodwill is inactive friendship, which—if it lasts through time and arrives at intimacy—becomes friendship.

This is not the friendship that exists because of utility, however, nor the one that exists because of pleasure; for even goodwill does not arise on the basis of these. For a person who has received a benefaction and allocates goodwill in return for what he has received does what is just. But a person who wishes another person to do well, expecting to get resources through him, seems to have goodwill not toward him but more toward himself, just as he is not a friend, either, if he takes care of another because of some use to be made of him.

Goodwill arises, on the whole, because of virtue and some sort of decency—when one person appears to another to be noble, brave, or something like that—just as in the case of the contestants we mentioned.[180]

179. 1155^{b}32–1156^{a}5, 1158^{a}4–10.
180. 1166^{b}35.

9.6
Friendship and Concord

Concord too is apparently something fitted to friendship. That is why it is not agreement in belief; for that might occur even among people who do not know each other. Neither are people said to be in concord when they are of one mind about just anything—for example, on matters related to the heavens (for concord concerning these is not fitted to friendship). On the other hand, we do say that a city is in concord when people are of one mind about the things that are advantageous, deliberately choose the same things, and put into action the things they have resolved in common.

Things doable in action, then, are what concord is concerned with, and of these, the ones that have a certain magnitude and where it is possible for both or all parties to attain them. Cities are in concord, for example, when all resolve to have offices be elective, to form an alliance with Sparta, or to have Pittacus rule (when he too is willing to do so). But when each of the two parties wishes the rule for himself, like those in the *Phoenician Women*,[181] they factionalize; for it is not concord when each of the two parties thinks the same thing, whatever it may be, but rather when they think it in connection with the same party (for example, when both the common people and the **1167b1** decent ones think that the best people should rule); for that way all the parties get what they are aiming at. Concord is apparently political friendship, then, as it is in fact said to be; for it is concerned with things that are advantageous and ones that affect our life.

This sort of concord is found among decent people; for they are in accord both with themselves and with others—out for the same things, one might almost say (for the wishes of such people remain the same, and do not ebb and flow like a tidal race). And they wish for just things as well as advantageous ones, and these they also seek in common.

Base people, however, cannot be in concord, except to a small extent, any more than they can be friends, since they aim at a greedy share in benefits, but in labors and charitable services a deficient one. And since each one wishes these things for himself, he keeps an eye on his neighbor and stands in his way, with the excuse that if people do not keep watch, the common good gets ruined. The result is that they factionalize, compelling each other to do just things but not wishing to do them themselves.

9.7
Benefactors and Beneficiaries in Friendships

Benefactors seem to love their beneficiaries more than those who have been benefited love the givers, and this is investigated on the supposition that it is contrary to reason for it to happen. To most people it appears that one lot are debtors, the other

181. Euripides.

lot creditors. Just as in the case of a loan, then, where debtors wish their creditors did not exist anymore, while creditors even take care to preserve the safety of their debtors, in the same way it is thought that benefactors wish their beneficiaries to exist as providers of gratitude, while the beneficiaries are careless about making the return. Epicharmus would perhaps claim that most people say this because "they are looking at the matter from a wicked person's point of view,"[182] yet it would seem to be a human trait; for ordinary people are forgetful and aim to receive benefits more than to confer them.

But the cause would seem to be more natural than that, and the case concerning creditors would seem to be not even a similar one; for it does not involve a way of loving on their part, but rather a wish to safeguard their debtors for the sake of recovering a debt. Benefactors, by contrast, love and like their beneficiaries even if they are of no use to them and would not become so later.

Precisely the same happens in the case of craftsmen too; for all of them like their own work more than they would be liked by it if it became animate. But perhaps this happens most where poets are concerned; for they have an excessive liking for their own poems, feeling affection for them as for children.

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This, then, is the sort of case that the one of the benefactors actually resembles; for the fact that someone has been benefited is their work. It, then, they like more than the work does its producer. The cause of this is the following: existence is choiceworthy and lovable for everyone; we are by being in activity (for we *are* by living and doing actions); and the producer in activity is in a way the work. He feels affection for his work, then, because he feels affection for existence too. And this is natural; for what he is in potentiality, his work manifests in activity.

At the same time, to the benefactor, what is in accord with his action is noble, so that he enjoys the person in whom it occurs. The person acted on, by contrast, finds nothing noble in the agent, but, if anything, something advantageous, and this is less pleasant and less lovable.

What is pleasant, however, when it belongs to the present is activity; when it belongs to the future is expectation; and when it belongs to the past is memory. But what is most pleasant—and similarly most an object of love—is what is in accord with activity. For the person who has produced something, his work endures (since what is noble is long lasting), while for the person acted on, the utility passes away. As for memory, that of noble things is pleasant too, while that of useful ones is scarcely pleasant at all or less so; although the reverse would seem to hold of expectation. Also, loving something is like producing something, while being loved is like having something done to you. And it is for those who exceed where action is concerned that loving and the features fitted to friendship follow.

Further, everyone feels more affection for those things that come about by his painful labor—for example, in the case of money, those who have made it more than

182. Otherwise unknown.

those who have inherited it. To be benefited, though, seems to involve no painful labor, while to confer benefits seems like hard work. It is also because of these factors that mothers are the more child-loving ones; for giving birth involves more painful labor, and they know better that the children are their own. This feature too seems to properly belong to benefactors.

9.8
Puzzles about Self-Love

There is also a puzzle about whether one should love oneself most or someone else. For people admonish those who like themselves most, calling them "self-lovers," on the supposition that this is actually something shameful. It seems too that the base person does all his actions for the sake of himself, and the more depraved he is the more he does so—people complain, therefore, that he "does nothing from himself."[183] The decent person, by contrast, seems to act because of what is noble, and the better he is the more he does so, and for the sake of a friend, disregarding his own interests.

With these accounts, however, our results clash—which is not surprising. For they say that one should love most the person who is most a friend, and the person who is most a friend is the one who wishes good things for the one for whom he wishes them and wishes them for the latter's own sake, even if no one will know. But these features are found most in one's relations to oneself, as of course are all the others by which a friend is defined; for, as we said, it is from oneself that all the features fitted to friendship also extend to others. All the proverbs are also of one mind about this—for example, "one soul,"[184] and "what friends have they have in common," and "equality is friendship," and "knee is closer than shin";[185] for all these things are found most in one's relations to oneself; for one is a friend to oneself most of all, and must, then, love oneself most.

It is reasonable to be puzzled, then, as to which side one must follow, since both carry conviction. Presumably, in cases like these we need to draw distinctions in connection with the arguments, and determine to what extent and in what ways they grasp the truth. If, then, we were to find out what those on each side mean by "self-love," perhaps that would be clear.

Those who reduce it to a term of reproach call "self-lovers" those who allocate to themselves the greater share in money, honors, and bodily pleasures; for these are the things ordinary people desire and take seriously, on the supposition that they are the best goods—which is why they are fought about. Those people, then, who are greedy for these things gratify their appetites and their feelings and the non-rational part of

183. The precise meaning is obscure, but presumably cognate with "disregarding his own interests."

184. Euripides, *Orestes* 1046.

185. Theocritus, *Idylls* 16.18. Like our "Charity begins at home."

the soul generally. And ordinary people are like this, which is why the term has come about, deriving from the most ordinary case, which really is a base one. Those who are self-lovers in this way, then, are justly objects of reproach.

That it is those who allocate goods of this sort to themselves that most people are used to calling "self-lovers" is not unclear; for if someone were always taking more seriously than anything else the doing of just actions, or temperate ones, or whatever else might be in accord with the virtues, and in general were always keeping for himself what is noble, no one would call this person a "self-lover" or blame him.

But this sort of person would seem to be more of a self-lover. At any rate, he allocates to himself the good things that are noblest, and the ones that are best of all, and gratifies the element in himself that has most control, obeying it in everything. But just as a city too, or any other complex system, seems to be most of all its most controlling part, so also does a human being. The person is most of all a self-lover, then, who likes this part and gratifies this part.

Also, a person is called "self-controlled" or "lacking in self-control" depending on whether or not his understanding is in control, on the supposition that this is what each person is, and it is actions involving reason that people seem most of all to do themselves and to do voluntarily. It is not unclear, then, that this part is what each **1169^{a}1** person is or is most of all and that the decent person likes this part most.

That is why the decent person is most of all a self-lover, but of another form than the one that is reproached and differing from it as much as living in accord with reason does from living in accord with feeling, and as much as desiring the noble, on the one hand, does from desiring the seemingly advantageous, on the other.

Those, then, who take especially seriously the doing of noble actions are welcomed and praised by everyone. And if everyone competed for what is noble and strived to do the noblest actions, everything would be as it should as regards the common good, and each person as an individual would have the greatest of goods, if indeed virtue is such. So the good person should be a self-lover (for by doing noble actions he will both profit himself and benefit others), while the depraved person should not be one (for he will harm both himself and his neighbors through following his base feelings).

In the case of the depraved person, the things he should do clash with the ones he does, while the things the decent person should do are the very ones he does; for every understanding chooses what is best for itself, and a decent person obeys his understanding.

It is true of the excellent person too that he does many actions for the sake of his friends and his fatherland, even dying for them if need be; for he will give up wealth, honors, and fought-about goods generally, in keeping what is noble for himself; for he would choose intense pleasure for a short time over weak pleasure for a long one, living life nobly for a year over many years lived in random fashion, and a single noble and great action over many small ones. This is presumably what happens with those who die for others. They are choosing, then, something of great nobility for themselves. And they would give up wealth on the condition that their friends get

more; for while the friend gets wealth, the excellent person himself gets what is noble. The greater good, then, he allocates to himself.

As regards honors and ruling offices, he is the same way; for he will give up all these for his friend; for this is noble and praiseworthy for himself. It makes perfect sense, then, that he seems excellent, choosing as he does what is noble before anything else. But it may be that he will even give up actions in favor of his friend, and that it is nobler to be the cause of his friend's doing the action than to do the action himself.

In the case of every praiseworthy thing, then, the excellent person manifestly allocates the greater share of what is noble to himself. In this way, then, one should be a self-lover, as we said.[186] But in the way ordinary people are, one must not.

9.9
Does a Happy Person Need Friends?

There is also a dispute regarding the happy person as to whether he will need friends or not. For people say that those who are blessed and self-sufficient have no need of friends at all; for they already have the things that are good, and being self-sufficient, then, they need nothing in addition, while a friend, being another oneself, provides the things that one is unable to provide by oneself. Hence the saying, "when your *daimôn* does well (*eu*) by you, what need of friends?"[187]

It seems strange to allocate all the good things to the happy person and yet not to grant him friends, who seem to be the greatest of external goods. And if it is more characteristic of a friend to confer benefits than to receive them, and if it is characteristic of the good person and of virtue to do the benefiting, and if it is nobler to confer benefits on friends than on strangers, the excellent person will need people to receive his benefits. That is also why the question is asked about whether it is in good luck that friends are needed more or in bad luck, on the supposition that in times of bad luck we need benefactors and in times of good luck people to confer benefits on.

It is presumably strange too to make a blessed person live a solitary life; for no one would choose to have every good thing yet be by himself; for a human being is a political being and one whose nature is to live with others. To one who is happy, then, this also applies; for he has the natural goods. But clearly it is better to spend his days with friends and decent people than with strangers and random ones. Therefore, the happy person does need friends.

What, then, are the first lot claiming and in what way are they grasping the truth? Or is it that ordinary people think friends are those who are useful? But of friends of this sort, the blessed person will have no need, since he already has the things that are good. Neither, then, will he need (or only to a small extent) the ones who are friends

186. 1169a11–12.
187. Euripides, *Orestes* 667.

because of pleasure (for his life, being pleasant, has no need of adventitious pleasure). And because they do not need friends of these sorts, they seem not to need friends at all.

But this is presumably not true. For we said[188] at the start that happiness is a sort of activity, and it is clear that an activity is something that comes to be and does not belong to us like some possession. But if being happy lies in living and engaging in activity, and if the activity characteristic of the good person is intrinsically excellent and pleasant (as we said[189] at the start), and if things that are properly our own are among the things that are pleasant, and if we are better able to contemplate our neighbors than ourselves, and their actions than those that are properly our own, then the actions of excellent people who are their friends are pleasant to good people (for they have both of the features that make them by nature pleasant). The blessed person, then, will need friends of this sort, if indeed he deliberately chooses to contemplate decent actions that are properly his own, and the actions of a good person who is a friend are like this.

People think too that the happy person must be living pleasantly. But for a solitary person life is difficult; for it is not easy for him, when all by himself, to be continuously engaged in activity, while together with others and in relation to others it is easier. His activity, then, is more continuous, being intrinsically pleasant, as it must be for the blessed person; for the excellent person, insofar as he is excellent, enjoys actions that are in accord with virtue, but is repelled by those that stem from vice, just as the musician enjoys noble melodies and is pained by those that are base. A sort of training in virtue also comes about from living together with good people, as Theognis says.[190]

If we investigate the matter in a way more appropriate to natural science, the excellent friend seems to be naturally choiceworthy for an excellent person. For, as we said, what is by nature good is intrinsically good and pleasant for the excellent person. Living is defined in the case of animals by a capacity for perception and in the case of human beings by a capacity for perception or understanding. And a capacity is brought back to its activity, so that in the strict sense the thing resides in the activity. Living in the strict sense, then, seems to be [actively] perceiving or understanding. Living, however, is among the things that are intrinsically good and pleasant; for it is something determinate, and being determinate is characteristic of the nature of the good. And what is by nature good is also good for the decent person, which is why it seems pleasant to everyone. (But we should not take as an example a way of living that is depraved and destructive or one spent in pain; for living like that is indeterminate, as are the qualities that belong to it. In what follows, however, matters concerning pain will be made more evident.)

188. 1098^{a}16–20, 1098^{b}30–31.
189. 1099^{a}13–15, 21–24.
190. 1172^{a}13–14.

But if living itself is good and pleasant (as it seems to be from the very fact that everyone desires it, and decent and blessed people most of all; for life is more choiceworthy for them and living more blessed), and if a person who sees perceives that he sees and one who hears perceives that he hears and one who walks perceives that he walks, and if in the other cases too there is similarly something that perceives that we are in activity, so that if we are perceiving, we perceive that we are perceiving; and if we are understanding, we are perceiving that we are understanding; and if perceiving that we are perceiving or understanding is perceiving that we are existing (for existing, we said, consists in perceiving or understanding), and if perceiving that **1170b1** we are living is one of the things that is intrinsically pleasant (for living is something naturally good, and perceiving what is good to be present in ourselves is pleasant), and if living is choiceworthy and most so for good people, because for them existing is good and pleasant (for they take pleasure in being co-perceivers of what is intrinsically good), and if in the way an excellent person is related to himself he is also related to his friend (for a friend is another himself), then just as his own existing is choiceworthy for each one, so—or to much the same extent—is that of his friend too. But, as we saw, his existence is choiceworthy because he perceives himself as being good, and such perceiving is intrinsically pleasant. He must, therefore, also co-perceive his friend's existence together with his own—something that comes about in their living together and sharing in talk and thought; for this is what living together would seem to mean in the case of human beings and not, as in the case of cattle, grazing in the same place.

If, then, existence is intrinsically choiceworthy for the blessed person (for it is by nature good and pleasant), and to much the same extent that of his friend is too, his friend would also be among the things that are choiceworthy. But what is choiceworthy for him he must have, or else he will be in this respect lacking. Therefore, someone who is to be happy will need friends who are excellent.

9.10
How Many Friends Should We Have?

Must we, therefore, make as many friends as possible? Or, as in the case of guest-friendship, where it has been appropriately said, it seems, that one should be "neither many-guest-friended nor guest-friendless,"[191] is it the case in friendship too that it is appropriate to be neither friendless nor excessively many-friended?

With friends made with a view to utility, the saying would indeed seem to be entirely appropriate; for to reciprocate many people's services is a laborious task and a lifetime is not enough to do so. More of them, then, than are enough for one's own life are superfluous and a hindrance to living in a noble way. Hence one has no need

191. Hesiod, *Works and Days* 7.

of them. As for friends made with a view to pleasure, a few are sufficient, just like seasoning in nourishment.

But what about excellent people? Should one have as many as possible as friends or is there some measure for the number of friends, as there is for the number of people in a city? (For a city cannot come about from ten people, and if there are ten times ten thousand, it is a city no longer.) Presumably, the number is not a single number, but rather anything between certain determinate limits. Of friends too, then, there is a determinate number—perhaps the largest number a person could be living together with (for living together, we found, is most fitted to friendship).

That a person cannot both live together with a large number of people and parcel out himself among them is not unclear. Further, they too must be friends with each other, if all of them are going to be spending their days together, but this is hard work in a large group. It is also difficult for a large number of people to enjoy together and suffer together as if they were each other's own kin; for it is likely that being pleased together with one person and grieving together with another will both occur at the same time. Presumably, then, it is well not to seek to be too many-friended, but rather to have just as many friends as are enough for living together; for it would not seem even possible to be intensely friendly with a large number of people, which is why we cannot be in love with more than one person; for sexual love tends to be a sort of excessive friendship, and that excess is toward one person. Intense friendship, then, is toward few.

This also seems to be confirmed by the things at issue; for it just does not happen that many people become friends in accord with companionate friendship, and the cases celebrated in song are between two people. Those who are many-friended, on the other hand, and treat everyone they meet as if they were their own kin, seem to be friends with no one, except in a political way—in fact, people call them "ingratiating." In a political way, certainly, it is possible to be a friend to many people and yet not be ingratiating, but rather truly decent. But to be a friend to many people because of virtue and because of the friends themselves is not possible, and it must content us to find even a few friends like that.

9.11
Friends in Good Luck and in Bad

Do we need friends more in good luck or in bad? For they are sought after in both; for the unfortunate need assistance and the fortunate need people to share a life with and to benefit; for they wish to do well. Friendship is more necessary, then, in bad luck, which is why useful friends are needed there. But it is more noble in good luck, which is why we also seek decent friends; for it is more choiceworthy to confer benefactions on them and pass the time with them.

In fact, even the very presence of friends is pleasant in good luck and in bad too. For our pain is alleviated when friends share our suffering. That is why someone might even be puzzled about whether they, as it were, share our burden, or whether—without this happening—the pleasantness of their presence and the thought of their sharing our suffering lessens the pain. Whether it is indeed because of these factors or because of something else that the alleviation occurs is a puzzle we may set aside. At any rate, what we have described manifestly does happen.

It seems that their presence is a sort of mixture. For the very seeing of friends **1171b1** is pleasant, most of all in bad luck, and comes as a sort of assistance aiming at our not feeling pain (for a friend is someone who consoles us, both by the sight of him and by his words, if he is dexterous, for he knows our character and the things that please and pain us). But to see him pained at our strokes of bad luck is painful; for everyone tries to avoid being a cause of pain to his friends. That is why people with a manly nature are wary of making their friends share their pain. And if he does not go to extremes in his painlessness, a manly person cannot endure the pain that ensues for them and in general does not allow fellow mourners, because he is not himself prone to mourning. But the weaker sex and men who are like them enjoy having people to weep with and love them as friends who share their suffering. It is clear, however, that one should imitate the better person in everything.

In good luck, by contrast, the presence of friends brings with it both a pleasant way of passing the time and the pleasant thought that they are pleased at the good things that are ours. That is why it would seem that we should eagerly invite our friends to share our strokes of good luck (for to be a ready benefactor is a noble thing), but be hesitant to invite them to share our strokes of bad luck (for we should share bad things as little as possible)—hence the saying, "My own strokes of bad luck are enough."[192] We must most of all summon our friends to our aid, however, when with little trouble to themselves they are likely to benefit us greatly.

Conversely, it is presumably fitting to go uninvited to the aid of those having bad luck and to do so eagerly (for it is characteristic of a friend to confer benefits, most of all on those who are in need and have laid no claim to them; for this is nobler and pleasanter for both parties). But when they are having good luck, though we should go eagerly when it is a matter of working together (for one needs friends for this too), we should do so in a leisurely fashion when there are benefits to be received; for it is not a noble thing to be eager to receive benefits. On the other hand, one must presumably be wary of getting a reputation for unpleasantness by rejecting them (which indeed sometimes happens).

The presence of friends, then, is apparently choiceworthy in all circumstances.

192. Source unknown. It is very close, however, to Euripides' *Orestes* 240.

9.12
Living Together

What those who are in love like most is the sight of the beloved, and choose this sort of perception over all the rest on the supposition that their love depends most on it for its existence and its coming to be. Therefore, isn't it that way with friends too, so that living together is most choiceworthy? For friendship is a community, and as a person is related to himself, so he is related to his friend as well. Where he himself is concerned, however, the perception that he exists is choiceworthy; so it is too, then, where his friend is concerned. But this perception's activity comes about in living together, so it makes perfect sense that this is what friends aim at.

And no matter what existing consists in for each sort of person, no matter what **1172[a]1** they choose to be living for the sake of, it is this they wish to pass their time doing in the company of their friends. That is why some drink together, some play dice together, while others train together, hunt together, or do philosophy together, each sort spending their days together in whatever they most like in life; for since they wish to be living together with their friends, they do those actions and share in those things in which they think living together consists.

The friendship of base people, then, turns out to be depraved; for, being unstable, they share in things that are base, and become depraved too by becoming like each other. The friendship of decent people, by contrast, is decent and increases with their social interaction. And they even seem to become better by being active and correcting each other; for they take on the imprint of those things in each other that they find pleasing—hence the saying, "From noble people noble things."[193]

So much, then, for friendship. The next thing we should discuss is pleasure.

BOOK 10

10.1
How to Discuss Pleasure

After these issues, the next thing to discuss, presumably, is pleasure. For it seems to be most intimately related to our kind, which is why people educate the young by steering them by pleasure and pain. And it seems too that with regard to virtue of character the most important thing is enjoying what one should and hating what one should. For [pleasure and pain] extend throughout the whole of a person's life and

193. Theognis, ln. 35 Diehl. The entire phrase is "From noble people you will learn noble things."

have a powerful influence with regard to both virtue and the happy life; for people deliberately choose pleasant things and avoid painful ones.

And it would seem that one must least of all neglect these sorts of issues, especially as they involve much dispute. For some say that pleasure is the good, while others, on the contrary, say that it is altogether bad—some presumably because they are convinced that this is how things actually are, others because they think it is better as regards our life to represent pleasure as a bad thing even if it is not; for ordinary people, they think, incline toward it and are slaves to pleasures, which is why one should lead them in the contrary direction; for in that way they would arrive at the mean.

But surely this is not the correct thing to say. For accounts of matters that lie in the sphere of actions and feelings carry less conviction than the facts. When, then, they clash with what is in accord with perception, they are despised and undermine the truth as well; for if someone who censures pleasure is seen at some time or other to be aiming at it, he is thought to be inclining toward it, as if, to him, every sort of pleasure was to be sought; for it is not characteristic of ordinary people to make distinctions.

It is true accounts, then, that seem to be most useful, not only with regard to knowledge but also with regard to our life; for since they are in tune with the facts, they carry conviction, which is why they encourage those who comprehend them to live in accord with them.

Enough, then, of such issues. Let us move on to the things that have been said about pleasure.

10.2
Disputes about Pleasure

Eudoxus thought that pleasure is the good, because he saw all things, both rational and non-rational, aiming at it, and that in all cases what is choiceworthy is what is decent, and that what is most so is what is most excellent. And[194] the fact that all are drawn toward the same thing indicated, he thought, that this is the best good for all of them (for each finds its own good as it finds its own nourishment) and that what is good for all of them and what all of them seek is the good. But his accounts carried conviction more because of his virtuous character than because of the accounts themselves; for he seemed to be exceedingly temperate. It was not, then, as a friend of pleasure that he seemed to say what he said but because things were truly that way.

And he thought that the matter was no less evident from the contrary (for pain is for all things something intrinsically to be avoided, so that, similarly, its contrary is choiceworthy); that what is most choiceworthy is what we choose neither because of something else nor for the sake of something else; and that pleasure is agreed to

194. Reading δὲ.

be a thing of this sort (for nobody asks what one is pleased for the sake of—the supposition being that pleasure is intrinsically choiceworthy).

Moreover, he argued that when pleasure is added to any other good (for example, acting justly or being temperate) it makes it more choiceworthy and that the good is only increased by the addition of itself. It would seem that this argument, at least, represents pleasure as a good, and no more a good than any other; for every good is more choiceworthy when it is together with another good than when it is on its own. It is by an argument of this sort indeed that Plato[195] does away with the view that pleasure is the good; for he argues that the pleasant life is more choiceworthy with the addition of wisdom than without it, and that if the mixture is more excellent, pleasure is not the good; for there is nothing which, when added to the good, makes it more choiceworthy. And clearly nothing else would be the good either, if it becomes more choiceworthy by being together with any one of the intrinsic goods.

What, then, is there that is like this and that we share in? For this is the sort of thing we are seeking.

As for those who object [to Eudoxus' argument] by saying that what all seek is not good, surely there is nothing in what they say. For things that seem to be so to everyone, these, we say, are so. And the person who does away with this conviction [about the good] will scarcely say anything that is more convincing. For if it is those without understanding that desire these things, there would be something in what was said, but if practically wise ones do so as well, how could there be anything in what they say? But perhaps even in base ones there is some naturally good element, more excellent than themselves, which seeks the good that properly belongs to them.

It does not seem that the point about the contrary is correctly put either. For they say that if pain is bad, it does not follow that pleasure is good; for bad is also opposed to bad, and both bad and good to what is neither.[196] In saying this, they are not wrong, but in the case of the things at issue, at least, they are not speaking the truth either. For if both pleasure and pain were bad,[197] both would have to be avoided, and if both were neither good nor bad, neither would have to be avoided or both equally. But as things stand, people manifestly avoid pain as a bad thing and choose pleasure as a good one. This, then, must be the way they are opposed.

10.3
Pleasure Is a Good, Not the Good

Again, neither does it follow that if pleasure is not a quality, it is not a good either; for virtuous activities are not qualities either, nor is happiness.

195. *Philebus* 60d–e.
196. Reading μηδέτερα.
197. Reading ὄντων κακῶν.

But they say[198] that the good is determinate, while pleasure is indeterminate because it admits of more and less. If it is on the basis of people's being pleased that they judge this, the same will apply to justice and the other virtues, where we plainly say that people have more or less of these qualities and act more or less in accord with the virtues (for people can be more or less just or courageous, and act more or less justly or temperately). If, on the other hand, they judge it on the basis of the various pleasures, surely they are not stating the real cause, if indeed some pleasures are unmixed, others mixed.[199]

Again, what would prevent us from saying that just as health, while it is determinate, admits of the more and less, so too does pleasure? For the same proportion does not exist in everyone, nor is there always some single proportion in the same person, but it may be loosened and yet remain present up to a point, and so differ in the more and less. It is possible, then, for the same sort of thing also to hold concerning pleasure.

Again, by regarding the good as complete, but movements and comings to be as incomplete, they try to represent pleasure as a movement and a coming to be.[200] But they do not seem to be correct even in saying that it is a movement. For fastness and slowness seem to properly belong to every movement—if not in relation to itself (as, for example, in the case of the cosmos), then in relation to something else. To pleasure, by contrast, neither of these belongs. For while we can *become* pleased quickly, as we can become angry quickly, we cannot *be* pleased quickly, not even in relation to something else, while we can walk quickly, grow quickly, and the like. While, then, it is possible to change quickly (or slowly) to the state of pleasure, it is not possible to be active in relation to this state—I mean, to be pleased—quickly.

Again, how could pleasure be a coming to be? For it seems that one random thing does not come to be from another random thing, but rather what a thing comes to be from is what it is dissolved into, and so what pleasure is the coming to be of, pain would be the passing away of. They also say,[201] though, that pain is the need of what is in accord with nature, and pleasure its replenishment. And these feelings are bodily. If, then, pleasure is replenishment of what is in accord with nature, that in which the replenishment is found would also be what is being pleased; therefore, it is the body. But it does not seem to be. Therefore, the replenishment is not pleasure either, although when the replenishing takes place, a person would be pleased, and, when being cut,[202] pained.

This belief seems to have arisen from pains and pleasures connected with nourishment; for when people have developed a need, and so an antecedent feeling of pain, they are pleased by the replenishment. But this does not happen with all pleasures; for

198. Plato, *Philebus* 24e–25a, 31a.
199. Plato, *Philebus* 52b–d.
200. Plato, *Philebus* 53c–54d.
201. Plato, *Philebus* 31e–32b, 42c–d.
202. Reading τεμνόμενος.

those of learning are without pain as—in the case of the pleasures of perception—are those arising through smell; and many sounds, sights, memories, and expectations are like that as well. Of what, then, will they be comings to be? For no need of anything has developed of which they are the replenishment.

To those who cite the disgraceful pleasures, one might reply that these are not pleasant either (for if they are pleasant to those in a bad condition, one must not think that they are also pleasant, except to these people, just as one mustn't think either that things healthy, sweet, or bitter to sick people are such, or again that things are white which appear so to people with an eye disease).

Or else one might say that pleasures are choiceworthy but not from these sources, just as wealth is choiceworthy but not from treachery, and health but not from eating anything and everything.

Or that pleasures differ in form; for those from noble sources are different from those from shameful ones, and we cannot feel the pleasures of a just person without being just; or those of a musician without being a musician; and similarly in the other cases.

And that a friend is different from a flatterer seems to make it clear that pleasure is not a good or else that pleasures differ in form; for it is with a view to the good that the former seems to engage in social interaction with us, while the latter does so with a view to pleasure. Also, the latter is reproached, while people praise the former because he engages in social interaction with us with a view to different things.

Also, no one would choose to live having a child's level of thought throughout his life, even if he were to take the fullest possible pleasure in the things children take pleasure in, or to get enjoyment from doing some utterly shameful action, even if he were never going to suffer any pain for it. Moreover, there are many things we would consider excellent even if they brought no pleasure—for example, seeing, remembering, knowing, and possessing the virtues. But if pleasures necessarily accompany these, that makes no difference; for we would choose them even if no pleasure did come from them.

It seems clear, then, both that pleasure is not the good and that not every pleasure is choiceworthy, and that some pleasures, differing from the others in form or in their sources, are intrinsically choiceworthy.

Enough, then, for the things said about pleasure and pain.

10.4
Pleasure as Unimpeded Activity

What pleasure is or what sort of thing it is would become more evident if we take up the question again from the start. In fact, seeing seems to be complete at any time; for it does not need anything whose coming to be later will complete its form; and pleasure too seems to be like this. For it is a sort of whole, and there is no length of

time for which someone might take a pleasure the form of which would be completed if the pleasure were to last longer.

That is why pleasure is not a movement either. For every movement is in time, relates to some end, as does the craft of house-building, and will have its form completed once it produces what it seeks to produce—that is, in this whole time.

And all movements are incomplete in their parts (and during the corresponding time), which are distinct in form both from the whole movement and from each other. For putting together the stones is different from fluting the column, and both of these are different from producing the temple. Also, while the production of the temple is a complete production (for it needs nothing as regards what was proposed), the production of the foundation and of the triglyph are incomplete; for each is the production of a part. They differ in form, then, and it is not possible during any part of the time to find a movement that is complete as regards the movement's form, but if indeed such a movement is to be found, it is in the whole time.

And similarly in the case of walking and the rest. For if spatial movement is a moving from one place to another, of this too there are differences in form—flying, walking, leaping, and so on. And not only that, but there are differences even within walking itself; for the from-where and to-where are not the same in a whole stadium racecourse as they are in a part of it, or the same in one part as in another; nor is traversing this line the same as traversing that one; for we do not travel only along a line but also along one that is in a certain place, and this line is in a different place from that line.

Movement has been discussed in an exact way in other places,[203] and it does seem that it is not complete at every time, but that its many [sub-]movements are incomplete and different in form, if indeed the from-where and to-where constitute their form. But the form of pleasure is complete at every time whatsoever. It is clear, then, that pleasure and movement are different from each other and that pleasure is something whole and complete.

This would also seem to follow from the fact that it is not possible to be in movement and not take time, but it is possible to be pleased; for what occurs in the now is a sort of whole.

From these considerations it is also clear that those who say that there is a movement or a coming to be of pleasure[204] are not correct. For these are not said of everything but only of things that are divisible into parts and are not wholes; for there is no coming to be of seeing, or of a point, or of a unit, nor is there any movement or a coming to be of these at all. Of pleasure too, then, there is neither of these; for it is a sort of whole.

But since every perceptual modality is active in relation to its perceptible object, and is completely active when it is in good condition in relation to the noblest of its

203. *Ph.* 6–8.
204. Reading τῆς ἡδονῆς.

perceptible objects (for a complete activity seems to be most of all something of this sort; but whether it is the perceptual modality itself that is said to be active, or what it is in, is to make no difference), in the case of each perceptual modality, the best activity will be, then, the activity of the one that is in the best condition in relation to the most excellent of its objects; and this activity would be the most complete and most pleasant. For with every perceptual modality there is a pleasure connected, and the same holds for both thought and contemplation. But the most pleasant is the most complete, and the most complete is the activity of a subject that is in good condition in relation to the most excellent of its objects. And pleasure is what completes the activity. But pleasure does not complete it in the way that the perceptible object and the perceptual modality do when they are both excellent, just as health and a doctor are not in the same way a cause of being healthy.

(That pleasure arises in connection with each of the perceptual modalities is clear; for we say that sights and sounds are pleasant. And it is clear too that it does so most when the perceptual modality is at its best and is active in relation to an object that is in the same condition. And when the perceptual modality and the object being perceived are in a condition like that, there will always be pleasure—so long, at any rate, as what will produce the effect and what will be affected are both present.)

And pleasure completes an activity not as the state does by being present in something, but as a sort of supervenient end, like the bloom on those in their prime. So long, then, as the intelligible object or the perceptible one is as it should be, and what judges or contemplates is too, there will be pleasure in the activity; for when the affected and the affecter are similar and keep in the same relation to each other, the same thing naturally arises.

How is it, then, that no one is pleased continuously? Or is it that one gets tired? For continuous activity is impossible for all things human. No continuous pleasure, then, arises either; for it follows along with the activity. Some things delight us when they are novelties, but later delight us less, because of the same thing; for at first thought is called forth and is intensely active regarding them, as happens in the case of our sight when we look hard at something, but later the activity is no longer like that but has relaxed, which is why the pleasure too is dimmed.

Pleasure's being desired by everyone, one might think, is due to the fact that everyone also aims at living. And living is a sort of activity, and each person is active in relation to those things and with those things that he likes most—for example, a musician is active with his hearing in relation to melodies, and a lover of learning is so with his thought in relation to objects of contemplation, and so on for each of the others. And pleasure completes the activities and hence it completes living, which is what people find desirable. It is reasonable, then, that they aim at pleasure too; for, for each person, it completes living, and living is something choiceworthy.

But whether we choose living because of pleasure, or pleasure because of living—this is something we may set aside for the present. For the two appear to be coupled

together and not to admit of separation; for without activity pleasure does not arise, and every activity too is completed by pleasure.

10.5
Different Forms of Pleasure

That is why pleasures seem also to differ in form. For we think that things that are distinct in form are completed by distinct things (for this is apparently what happens both with natural things and with the products of craft—for example, animals, trees, a painting, a sculpture, a house, or a vessel) and, similarly, that activities that differ in form are completed by things that differ in form.

Activities of thought, however, differ in form from those of the perceptual modalities, and both differ in form among themselves. So too, then, do the pleasures that complete them. This would be evident also from the fact that each of the pleasures is intimately related to the activity it completes. For the pleasure that properly belongs to it assists in increasing the activity. For it is those engaging in the activity with pleasure who judge each thing better and treat it with greater exactness; for example, those who enjoy geometry become true geometers and understand each aspect of it better and, similarly, those who are lovers of music or building or whatever it is—each makes advances in their own work by finding enjoyment in it. And so the pleasures assist in increasing the activities. But what assists in increasing something properly belongs to that thing, and to things that are distinct in form, things that are also distinct in form properly belong.

This would be even more evident, however, from the fact that activities are impeded by pleasures arising from other sources. For lovers of pipe music are incapable of paying attention to a discussion if they happen to overhear someone playing the pipe, because they enjoy pipe playing more than the activity at hand. The pleasure connected with pipe playing, then, destroys the activity related to discussion.

This also happens in a similar way in other cases, when we are involved in two activities at the same time; for the more pleasant activity knocks out the other one, and all the more so if the difference in pleasure is large, so that we are not even active in the other. That is why when we enjoy something intensely, we scarcely do anything else, but do indeed do other things when only mildly pleased—for example, people who eat sweets in theaters do so most when the actors are bad.

And since the pleasure that properly belongs to an activity makes it more exact, longer lasting, and better, while alien pleasures spoil it, clearly they vary widely. For alien pleasures do pretty much precisely what proper pains do; for the pains that properly belong to activities destroy them—for example, if painting or rationally calculating is unpleasant and painful for someone, he does not write or rationally calculate, because the activity is painful. An activity is affected in contrary ways, then, by the pleasures and pains that properly belong to it—the ones that properly belong

being the ones that supervene on the activity intrinsically. As for the alien pleasures, we said that they have much the same effect as pain; for they destroy the activity, only not in the same way.

Since activities differ in decency and baseness, however, and some are choiceworthy, some to be avoided, and some neither, the same goes for pleasures as well; for each activity has a pleasure that properly belongs to it. The pleasure, then, that properly belongs to an excellent activity is decent, and the one that properly belongs to a base activity is depraved; for appetites too are praiseworthy when they are for noble activities, and blameworthy when for shameful ones. And the pleasures that are in the activities more properly belong to these than do the corresponding desires; for the desires are distinguished from the activities both in time and in nature, while the pleasures are closely related to the activities and so little distinguished from them that disputes arise as to whether the activity and the pleasure are the same thing. Still, pleasure does not seem to be thought or perception (for that would be strange), but because it is not found separated, it appears to some people to be the same as them.

Just as activities are distinct, then, so too are the corresponding pleasures. Sight differs from touch in purity, however, as hearing and smell do from taste. The pleasures, then, also differ in the same way, as the pleasures of thought do from these, and as, within each of the two, some do from others.

And each sort of animal seems to have a pleasure that properly belongs to it, just as it has a work; I mean the pleasure that is in accord with its activity. This would also become evident if we look at each: for horse, dog, and human being have different pleasures, and, as Heraclitus says, "Donkeys prefer sweepings to gold";[205] for food is more pleasant to donkeys than gold. While the pleasures, then, of those that are distinct in form also differ in form, it would make perfect sense for those of the same form not to differ. But in the case of human beings, at any rate, they do differ in no small way; for the same things delight some people and give pain to others, and while to some they are painful and hateful, to others they are pleasant and lovable. This also happens in the case of sweet things; for the same things do not seem sweet to the feverish person and to the healthy one, or hot to the weak person and to the one in good physical condition. And the same thing happens in other cases.

In all such cases, however, it seems that what is so is what appears so to an excellent person. And if this is correct, as it seems to be, and it is virtue and a good person (insofar as he is such) that are the measure of each thing, then pleasures would be those that appear to be pleasures to him, and the things that are pleasant would be the ones that he enjoys. But if the things he finds repellant seem pleasant to someone else, it is no wonder; for there are many ways for human beings to get destroyed or spoiled. Pleasant, however, these things are not, except to these people and to people in this condition. It is clear, then, that pleasures agreed to be shameful must be said not to be pleasures at all, except to people who have been destroyed.

205. B9 DK.

Among those pleasures that seem to be decent, however, which sort or which particular one must we say is characteristic of the human being? Or is this clear from the activities? For the pleasures follow along with these. So, whether the activities of the complete and blessed man are one or more than one, the pleasures that complete these would be said to be characteristically human pleasures in the strict sense, while the rest would be so in a secondary or many-times-removed way, as would the activities.

10.6
Happiness Reconsidered

Now that we have discussed matters concerning the virtues, friendships, and pleasures, it remains for us to go through happiness in outline, since we take it to be the end of human affairs. If we first recapitulate what was said previously about this, then, our account would be more concise.

We said[206] that happiness is not a state; for if it were, even someone who was asleep his whole life, living the life of plants, might possess it, or someone suffering the greatest strokes of bad luck. If, then, this is not satisfying, one must class happiness
1176[b]1 as a sort of activity, as was said previously.[207] And if some activities are necessary and choiceworthy because of other things, while others are intrinsically choiceworthy, it is clear that happiness must be classed as one of those that are intrinsically choiceworthy, not as one of those choiceworthy because of something else; for happiness needs nothing but is self-sufficient.

The ones that are intrinsically choiceworthy, however, are those from which nothing is sought beyond the activity. And actions in accord with virtue seem to be like this; for doing noble and excellent actions is one of the things that are choiceworthy because of themselves.

Pleasant amusements also seem to be like this; for we do not choose them because of other things. In fact, people are harmed by them more than benefited, through being led to neglect their bodies and possessions. Most of those who are called "happy," however, have recourse to such pastimes, which is why those who are witty participants in them enjoy a good reputation with tyrants; for they make themselves pleasant in supplying what these aim at, and tyrants need people like that. So these amusements seem to bear the stamp of happiness, because people in positions of power spend their leisure in them. Presumably, such people are not a sign of anything; for neither virtue nor understanding, which are the sources of excellent activities, depend on holding positions of power. And if, being unable to taste pure and free pleasures, people in such positions take refuge in the bodily ones, one must not

206. 1095[b]32–1096[a]2, 1098[b]31–1099[a]7.
207. 1098[a]5–6.

think these more choiceworthy because of this; for boys too think the most excellent things are the things most honored among themselves. It is reasonable, then, that just as different things appear estimable to boys and men, so it is too for base people and decent ones.

As we have often said,[208] then, what is estimable and pleasant is what is so to the excellent person. But for each person, the activity in accord with the state that properly belongs to him is most choiceworthy, and so for the excellent person it is the one in accord with virtue.

Therefore, happiness does not lie in amusement; for it would indeed be strange if the end were amusement and we did all the work we do and suffered evils all our lives for the sake of amusing ourselves. For we choose (one might almost say) everything for the sake of something else—except happiness: for end it is. But to engage in serious matters and to labor for the sake of amusement would be manifestly silly and utterly childish. And "amusing ourselves so as to engage in serious matters," as Anacharsis puts it, seems to be correct; for amusement is like relaxation, and it is because people cannot labor continuously that they need relaxation. End, then, relaxation is not; for it occurs for the sake of activity.

The happy life seems to be in accord with virtue, and this is one that involves **1177^{a}1** engagement in serious matters and does not lie in amusement. And we say that serious things are better than ridiculous ones and those that involve amusement, and that in every case the activity of what is better, whether a part or a human being, is more excellent. But the activity of what is better is more excellent and already bears more of the stamp of happiness.

Again, any random person—even a slave—can enjoy bodily pleasures no less than the best person can. But no one assigns a share in happiness to a slave any more than a share of the relevant sort of life. For happiness does not lie in such pastimes but in activities in accord with virtue, as was also said previously.[209]

10.7
Happiness as Contemplation

But if happiness is activity in accord with virtue, it is reasonable that it should be in accord with the one that is most excellent; and this would be the virtue of the best element. Whether, then, this element is understanding or something else that seems in accord with nature to rule, lead, and understand noble things and divine ones—whether by being something divine itself or by being the most divine element in us—the activity of it, when in accord with the virtue that properly belongs to it, would be complete happiness. That it is contemplative activity we have said.[210]

208. Most recently at 1176^{a}15–22, also 1113^{a}22–33, 1166^{a}12–13, 1170^{a}14–16.
209. Most recently at 1176^{a}35–^{b}9.
210. This has not in fact been said in so many words.

And this would seem to be in agreement both with what was said previously and with the truth. For this activity is also most excellent (for not only is understanding the most excellent element in us, but also, of knowable objects, the ones that understanding is concerned with are the most excellent ones). And further, it is the most continuous activity; for we can contemplate more continuously than we can do any action whatsoever.

Moreover, we think that pleasure must be mixed in with happiness, and the most pleasant of the activities in accord with virtue is agreed to be the one in accord with theoretical wisdom. Philosophy, at any rate, seems to involve pleasures that are wondrous in their purity and stability, and it is reasonable that those who have attained knowledge pass their time more pleasantly than those who are seeking it.

Moreover, the self-sufficiency that is spoken of would belong most of all to contemplative activity; for while a theoretically wise person, a just one, and people with the other virtues all need the things necessary for living, when these are adequately supplied, the just one still needs people to do just actions for and with, and similarly for the temperate person, the courageous person, and each of the others. But the theoretically wise person, even when by himself, is able to contemplate, and the more theoretically wise he is, the more he is able to do so. It is perhaps better for him to have co-workers, but nonetheless he is most self-sufficient.

Moreover, this activity, and only this, would seem to be liked because of itself
1177b1 [alone]; for nothing arises from it beyond having contemplated, while from the practical ones we try—to a greater or lesser extent—to get for ourselves something beyond the action.

Moreover, happiness seems to reside in leisure; for we do unleisured things in order to be at leisure, and wage war in order to live in peace. The activity of the practical virtues occurs in politics or in warfare, and the actions concerned with these seem to be unleisured and those in warfare completely so (for no one chooses to wage war for the sake of waging war, or to foment war either; for someone would seem completely bloodthirsty if he made enemies of his friends in order to bring about battles and killings). But the activity of the politician too is unleisured, and beyond political activity itself he tries to get positions of power and honors or, at any rate, happiness for himself and his fellow citizens—this being different from the exercise of politics and clearly something we seek on the supposition of its being different.

If, then, among actions in accord with the virtues, those in politics and war stand out in nobility and magnitude, but these are unleisured and aim at some end rather than being choiceworthy because of themselves, while the activity of understanding seems to be superior in seriousness because it is contemplative, to aim at no end beyond itself, and to have its own proper pleasure, which assists in increasing the activity, and if in addition the self-sufficiency, leisured quality, and un-weariness (so far as this is possible for a human being), as well as all the other things assigned to the blessed, are manifestly things that properly belong to this activity, then this activity

would be the complete happiness of a human being, provided it receives a complete span of life (for nothing is incomplete that is characteristic of happiness).

But such a life would be more excellent than one in accord with the human element; for it is not insofar as he is a human being that someone will live a life like that but insofar as he has some divine element in him; and to the degree that this element is superior to the compound, to that degree will its activity also be superior to that in accord with the other sort of virtue. If, then, understanding is something divine in comparison with the human element, so also a life in accord with it is divine in comparison with human life. And one must not, in accord with the makers of proverbs, "think human things, since you are human" or "think mortal things, since you are mortal," but rather one must as far as possible immortalize, and do everything to live in accord with the element in oneself that is most excellent; for even if it is small in bulk, in its capacity and esteem it far exceeds everything. **1178^{a}1**

It would seem too that each person actually is this, if indeed it is the controlling and better element. So it would be strange if he were to choose not his own life but that of something else. Moreover, what was said previously will fit now as well; for what properly belongs to each thing by nature is most excellent and most pleasant for each of them; for each human being, then, the life in accord with understanding is so too, if indeed this most of all is a human being. Therefore, this life will also be happiest.

10.8
Two Sorts of Happiness

Happiest, but in a secondary way, is the life in accord with the other virtue; for the activities in accord with it are [merely] human. For just actions, courageous actions, and other actions that we do in accord with the virtues, we do in relation to each other in contracts, catering to needs, and in every sort of action and in feelings as well, by keeping closely to what is appropriate to each person. And all of these are manifestly human. Indeed, some of them even seem to arise from the body, and virtue of character seems in many ways to be intimately related to feelings.

Practical wisdom too is coupled together with virtue of character, and it with practical wisdom, if indeed the starting-points of practical wisdom are in accord with the virtues of character and the correctness of these virtues is in accord with practical wisdom. And connected as these virtues also are with feelings, they would be concerned with the compound. But the virtues of the compound are [merely] human. So too, then, are both the life and the happiness that is in accord with them. But the virtue of understanding is separated. (About it, in fact, let just this much be said; for to develop an exact account of it is a greater task than the one we have set before us.)

It would seem too that the virtue of understanding has little need of external supplies or less need than virtue of character does. For let us grant that they both

need the necessary ones and to an equal extent, even if the politician does labor more in relation to the body and suchlike; for any differences here would be small. But as regards the activities there will be a large difference. For the generous person will need money for doing generous actions, and so will the just one, of course, for repaying debts (for wishes are not manifest things, and people who are not just pretend to wish to do just actions). And the courageous person will need capacity,[211] if indeed he is to bring to completion anything that is in accord with his virtue. And the temperate one will need authority; for how else would it be manifest that he or any of the others is what he is?

Moreover, it is disputed whether it is deliberate choice or action that is the more controlling element in virtue, on the supposition that it depends on both. But its completeness clearly does depend on both; although for the actions many things are needed and more of them the greater and more noble the actions are.

The person who is contemplating, by contrast, needs none of these things, at any rate, for the activity. On the contrary, one might almost say that they are even impediments, at any rate, to his contemplating. But insofar as he is a human being and living with many other people, he chooses to do the actions that are in accord with virtue and so will need such things for living a human life.

But that complete happiness is a sort of contemplative activity would also be evident from the following considerations. For we suppose the gods to be the most blessed and happy of all. But what sorts of actions must we assign to them? Just ones? Won't they appear ridiculous if they engage in transactions, return deposits, and so on? Courageous ones, then, enduring what is frightening and facing danger because it is a noble thing to do? Or generous ones? To whom will they give? It will be a strange thing if they actually have money or anything like that. And their temperate actions, what would they be? Or isn't it unrefined to praise them for not having base appetites? If we were to go through them all, it would be evident that everything to do with actions is petty and unworthy of gods. Nonetheless, everyone supposes them to be living, at any rate, and therefore in activity; for surely they are not sleeping like Endymion.[212] If, then, living has doing actions taken away from it and still more so producing, what is left except contemplating? So the activity of a god, superior as it is in blessedness, would be contemplative. And the activity of humans, then, that is most akin to this would most bear the stamp of happiness.

A further sign of this is that other animals, being completely deprived of this sort of activity, do not share in happiness. For the life of the gods is blessed throughout, that of human beings is so to the extent that it has something similar to this sort of activity, but of the other animals, none has access to happiness, since they in no way share in contemplation. Happiness extends, then, just as far as contemplation does, and those to whom it more belongs to contemplate, it also more belongs to be happy,

211. Either in the shape of personal prowess or in the shape of a force of fellow soldiers.
212. Made immortal by Selene, but cast into a deep sleep.

not coincidentally, but in accord with contemplation; for this latter is intrinsically estimable. So happiness would be some sort of contemplation.

But to the extent that someone is a human being, he will also need external prosperity; for his nature is not self-sufficient for contemplation, but his body must be healthy and provided with nourishment and other sorts of service. Nonetheless, one must not think that a person who is going to be happy needs many things and grand ones, even if it is not possible for him to be blessed without external goods; for self-sufficiency does not lie in an extreme amount of these and neither does action. But it is possible to do many noble actions even without ruling land and sea; for even from moderate resources a person can do actions in accord with virtue. (This is plain enough to see; for private individuals seem to do decent actions no less, or even more, than people in positions of power.) It is enough, then, to have that amount; for the life of a person who is active in accord with virtue will be happy.

Solon too was presumably depicting happy people correctly when he described them as moderately supplied with external goods but as having done what he regarded as the noblest actions and lived their lives temperately; for it is possible for those with moderate possessions to do the things one should. Anaxagoras[213] also seems to have supposed the happy person to be neither rich nor in a position of power when he said that it would be no wonder if the happy one appeared to be a strange sort of person to ordinary people; for these judge by external goods; for these are the only ones they can perceive. The beliefs of wise people, then, would seem to be in harmony with our arguments.

But while these sorts of considerations also carry a certain persuasiveness, the truth in practical matters must be judged from the works and the life; for these are what have the controlling vote. When we examine what has been previously said, then, it must be judged by bringing it to bear on the works and the life, and if it is in harmony with them, one must accept it, but if it clashes, one must suppose it mere words.

The person whose activity is in accord with understanding, however, and who takes care of it, would seem to be both in the best condition and the one most loved by the gods. For if the gods exercise a sort of supervision over human affairs, as indeed they seem to, it would also be reasonable both that they should enjoy what is best and most akin to themselves (and this would be the understanding) and that they should reward those who most like and honor it for taking care of what they themselves love and for acting correctly and nobly. But that all these qualities belong most of all to the wise person is not unclear. Therefore, he is most loved by the gods. And the same person is also likely to be the happiest. So in this way too the wise person would be most happy of all.

213. *EE* $1215^{b}6$–14, $1216^{a}11$–16.

10.9
Politics, Legislators, and Happiness

Well then, if we have said enough in outline about these issues and about the virtues, and further about friendship and pleasure, must one think that our deliberate choice has achieved its end? Or is it, as the saying goes, that in the case of practical matters the end is not to contemplate and know each of the various things but to put these into action? To know about virtue is not enough either, then, but we must try to have and use it or to become good in whatever other way we can?

If arguments were self-sufficient for making people decent, "many and large the wages they would earn," as Theognis says,[214] and justly so, and arguments would be what need to be provided. As things stand, however, they appear to have the strength to encourage and stimulate those of the young who are free-minded, and to make ready to be possessed by virtue a character that is well-bred and that truly loves the noble, but to be unable to encourage ordinary people toward noble-goodness; for ordinary people naturally obey not shame but fear and abstain from base things not because of their shamefulness but because of the sanctions involved; for living by feeling as they do, they pursue the pleasures that are properly their own as well as the things through which these come about, and avoid the opposing pains. Of the noble and the truly pleasant, however, they have no understanding at all, not having tasted it.

What sort of argument, then, could reform such people? For it is not possible—or not easy—to alter by argument what has long since been locked up in traits of character. Presumably, we must be content if, when we have all the things through which it seems we become decent people, we achieve some share of virtue.

Some people think that it is by nature that we become good, while some think that it is by habit and others by teaching. Nature's contribution is clearly not up to us, but because of some divine causes is present in those who are truly lucky. Argument and teaching, on the other hand, surely do not have strength in everyone, but rather the soul of the listener must be prepared beforehand through habits to enjoy and hate in a noble way, like earth that is to nourish seed. For the one who lives in accord with his feelings would not listen to—or, what is more, comprehend—any argument that encourages him to turn away. And in a state like that how is it possible to persuade him to change his ways? Moreover, feeling generally seems to yield not to argument but to force. Character, then, must in some way be there beforehand and properly suited for virtue, liking the noble and repelled by the shameful.

It is difficult, however, for someone to get correct guidance toward virtue from childhood if he has not been nurtured under laws of the appropriate sort; for a moderate and resilient way of living is not pleasant for ordinary people, most of all when

214. Lns. 432–434 Diehl.

they are young. That is why laws must prescribe their nurture and practices; for these will not be painful when they have become habitual.

But it is not enough, presumably, that when people are young they get the correct nurture and supervision. On the contrary, even when they have grown into adulthood they must continue to practice the same things and be habituated to them, and so there would need to be laws concerning these matters as well and, in general, then, concerning all of life; for ordinary people obey force rather than argument and penalties rather than the noble. **1180ᵃ1**

That is why some think[215] that legislators should, on the one hand, exhort and encourage people toward virtue for the sake of the noble (on the supposition that those who have been decently guided in the formation of habits will listen), and, on the other hand, impose punishments and sanctions on those who disobey and are not naturally well-disposed, while entirely expelling those who are incurable;[216] for the decent person, they think, living as he does with a view to the noble, will obey reason, while a base one, whose desire is for pleasure, needs to be punished by means of pain, like a beast of burden. That too is why they say that the sorts of pains inflicted should be such as are most opposed to the pleasures liked.

Whatever about that; if, as we said, the one who is to be good should be nobly nurtured and habituated and then live that way in decent practices and neither involuntarily nor voluntarily do base actions, this would happen if people lived their life in accord with a sort of understanding and correct constitutional order and this had the requisite strength.

Paternal instructions do not have such strength or the element of compulsion and neither, then, do the instructions of any individual man in general (unless he is a king or something like that). The law, however, does have the capacity to compel, being word that derives from a sort of practical wisdom and understanding. And while people feel enmity toward human beings who oppose their impulses, even if they do so correctly, the law causes no offense in prescribing what is decent.

Yet it is in the city of the Spartans alone (or almost alone) that the legislator[217] seems to have created the supervision of nurture and also of practices. In most cities, however, such matters are utterly unsupervised, and each person lives as he wishes, Cyclops-fashion, laying down the law "for children and wife."[218]

The most excellent thing, then, is that there should be communal supervision that is correct. But if things are communally unsupervised, it would seem appropriate for each individual to further the virtue of his own children and friends—to be capable of doing it,[219] or, at any rate, of deliberately choosing it. But he would be more capable of doing this, it seems, given what has been said, if he becomes competent

215. Plato, *Laws* 718c–723d.
216. Plato, *Protagoras* 325a–b.
217. Lycurgus, *Pol.* 2.9.
218. Homer, *Odyssey* 9.114–115.
219. Transposing καὶ δρᾶν αὐτὸ δύνασθαι from 1180ᵃ30.

in legislative science. For it is clear that communal sorts of supervision come about through laws and that decent ones do so through excellent laws. Whether the laws are written or unwritten would seem to make no difference, nor would it make a difference whether one or many are thereby educated—any more than it does in the case of music, physical training, or any of the other practices. For just as lawful things and habits[220] have strength in cities, so in households do paternal words and habits (still more strength, in fact, because of the kinship and the benefactions involved; for children are by nature predisposed to feel affection and be ready to obey).

Further, particularized education is actually superior to communal education, just as in the case of medicine; for while rest and abstinence from food are in universal terms advantageous for a feverish patient, for a particular patient, presumably, they may not be, nor does a boxing instructor prescribe the same style of fighting for everyone. It would seem, then, that a particular case is treated with more exactness when there is individual supervision; for each person is more likely to get what suits him. But the best supervision in each particular case will be provided by the doctor, athletic trainer, or whoever else has knowledge of the universal and knows what applies in all cases or in these sorts (for the sciences are said to be—and actually are—of what is common).

But, despite that, there is nothing to prevent a single individual from being correctly supervised even by someone without scientific knowledge but who has—due to experience—seen exactly what happens in each particular case, just as some people seem to be their own best doctors even though they would be of no assistance at all to another person. Nonetheless, it seems, presumably, that the one who does wish to become expert in a craft or in a theoretical science must take steps toward the universal and come to know it as well as possible; for that, we said, is what the sciences are concerned with.

Maybe, then, the one who wishes to make people—whether many or few—better because of his supervision must also try to acquire legislative science, if it is through laws that we can become good. For producing a noble disposition in anyone whatsoever—in anyone put before him—is not a matter for some random person, but if indeed anyone can do it, it is the person who has knowledge, just as in medicine and in all other matters that involve a sort of supervision and practical wisdom.

Mustn't we next investigate, then, from what sources and in what way someone might become competent in legislative science? Or isn't it, as in other cases, from politicians? For, as we saw,[221] legislative science seems to be a part of politics. Or isn't it evident that it is the same in the case of politics as in the other sciences and the other capacities? For in the others, it is evident that it is the same people who impart their capacities to others as actively practice them themselves, just as with doctors or writers. In the case of politics, however, although it is the sophists who profess to

220. Reading ἔθη twice.
221. 1141b24–25.

teach it, it is practiced not by any of them but by politicians, and they seem to do so thanks to some sort of capacity and to experience rather than to thought; for it is evident that they neither write nor speak about such matters (and yet that would be a nobler thing, presumably, than to compose speeches for the law courts and the assembly), and further, it is evident that they have not made their own sons or any other friends of theirs into politicians either. But it would be reasonable for them to have done so, if indeed they were able to; for there is nothing better than this capacity that they could have left to their cities or could have chosen to have for themselves or, then, for their closest friends. Still, experience does seem to make no small contribution; for otherwise people could not, through intimacy with politics, have become politicians. That is why those who aim to know about politics would seem to need experience in addition.

Those of the sophists who profess to teach politics, however, are manifestly a long way from teaching it; for on the whole they know nothing about what sort of thing it is or what sorts of things it is concerned with; for if they did, they would not have taken it to be the same as rhetoric or even inferior to it, nor would they have thought that legislating is an easy matter for anyone who has collected together laws that enjoy a good reputation; for it amounts to selecting the best ones—as if the selection did not call for comprehension and correct judgment were not, as in matters of music, the greatest thing. For those with experience in a particular area judge the works in it correctly and comprehend by what means or in what way they are brought to completion, and judge what is in tune with what, while those without experience must be content not to have it escape them whether the work is well or badly made, as in the case of painting. But laws would seem to be the works of politics, so how, on the basis of them, could someone become competent in legislative science or judge which laws are best them? For it is evident that we do not become doctors from reading textbooks either.

And yet these textbooks do try to say not only what the treatments are but also how each sort of patient might be cured and should be treated, distinguishing their various states. But while these do seem to be of benefit to experienced people, to those without scientific knowledge they seem useless. Presumably, then, collections of laws and constitutions might also be of good use to people who are able to get a theoretical grasp on them and judge what is correctly done or the opposite and what sorts of things fit with what. In those who go through them without being in this state, however, no correct judgment would be present, unless of course by chance, although they may become better comprehenders of them.

So, since our predecessors have left the subject of legislation unexamined, it is presumably better if we ourselves investigate it and indeed constitutions generally, so that as far as possible our philosophy of human affairs may be brought to completion.

First, then, if there is anything that has been correctly said by our predecessors on some part of the subject, let us try to go through it and then, on the basis of the

collection of constitutions,[222] try to get a theoretical grasp on what sorts of things preserve and destroy cities, what sorts of things preserve or destroy each sort of constitution, and what causes some cities to be well governed and others the opposite. For when we have a theoretical grasp on these matters, maybe we will also be better able to see what sort of constitution is best, how each sort is arranged, and what laws and habits it uses.

Let us discuss this, then, starting from the beginning.

222. The 158 constitutions compiled under Aristotle's supervision, of which only the *Athenian Constitution* survives complete.

†MAGNA MORALIA*

The Great Ethics

BOOK 1

1.1
Ethics, Virtue, and the Good

1. Since we are deliberately choosing to speak about characters, we must first investigate what character is a part of. Speaking concisely, then, it would seem to be a 1181ª25
part of nothing other than politics. For one cannot do any action in politics without being of a certain sort—I mean, the sort an excellent person is. And to be excellent is to have the virtues. **2.** Therefore, if one is going to be a doer of actions in political matters, one must be excellent in one's character. **3.** Therefore, a study concerned 1181ᵇ25
with characters is a part, as it seems, and a starting-point of politics. And as a whole, it seems to me, the study would rightly be titled not "ethics" but rather "politics."

4. Therefore, we must, as it seems, first speak about virtue, what it is and from **1182ª1**
what it comes about. For presumably there is no profit in knowing virtue without knowing how it will come about and from what. For we must investigate it not only in order to acquire knowledge of what virtue is, but also investigate from what it will arise. For we at the same time wish to know [virtue] and also to be of the virtuous sort 5
ourselves, and we will not be able to be this, if we do not know both from what, and in what way, it will come about. It is necessary, then, to know what virtue is. **5.** For it is not easy to know from what, and in what way, it will come about, without knowing its what-it-is, just as in the case of the sciences. We must not fail to consider, either, anything said by those who have previously spoken about these issues. 10

6. It was Pythagoras, then, who first attempted to speak about virtue, although not in the correct way; for by reducing virtues to numbers, he produced a theoretical investigation that did not properly belong to the virtues; for justice is not a number that is an equal times an equal.[1]

7. Socrates, coming after him, spoke better and more fully about these, although 15
even he did not do so correctly. For he made the virtues sciences;[2] but it is impossible

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* Translated by C. D. C. Reeve. Text: F. Susemihl, *Aristotelis Quae Ferentur Magna Moralia* (Leipzig, 1883), in consultation with H. M. Johnstone, *Prolegomena to a Critical Edition of the Aristotelian Magna Moralia* (DPhil. diss., Oxford, 1997). The title of the treatise may derive simply from the length of the two papyrus rolls containing its component books.

1. I.e., a number that is N × N, or square. See *Met*. 985ᵇ29.

2. *NE* 1144ᵇ28–30.

for them to be this. For the sciences all involve reason, and reason appears in the part of the soul involving thought. All the virtues, then, according to him, appear in the rationally calculative part of the soul. The result is that by making all the virtues sciences he does away with the non-rational part of the soul, and by doing this he also does away with feeling and character. That is why he did not in this respect grasp the virtues correctly.

8. After this Plato correctly divided the soul into the part having reason and the non-rational one, and assigned to each the virtues that properly belong to it.[3] Up to this point, then, he did well. After this, however, he was no longer correct. For he mixed and coupled virtue into his study of the [Form of the] good,[4] which is *not* correct; for it does not properly belong there; for in speaking about the beings and truth, he should not have been speaking about virtue; for there is nothing common to the former and the latter.[5]

9. These people, then, touched on the subject to this extent and in this way. The next thing to be investigated is what we ourselves must say about these. First, then, we must see that every science and capacity has some end, and this end is something good. For no science or capacity exists for the sake of something bad. **10.** If, then, the end of all capacities is something good, it is clear that that of the best one would be **1182b1** best. But politics is the best capacity, so that its end would be a good. Therefore, it is about a good that it seems we must speak; and not about the unconditional good, but about the good for us. For the good of the gods is not for us to speak about, but rather that belongs both to another account and to an investigation alien to our purpose.

11. Therefore, it is the political good that we must speak about. But this in turn we must divide. About the good said in what way? For the good is not simple. For we call "good" either the best in the case of each of the beings (and this is what is choiceworthy because of its own nature) or what other things are good by participating in, and this is the Form of the good. **12.** Must we speak about the Form of the good, then, or not about it, but rather about the common good that is present in all things? For this would seem to be distinct from the Form. For the Form is intrinsically separate, while the common good is present in all things; it is not, then, the same as the separate one. For what is separate naturally and intrinsically could never be present in all things.

13. Are we, then, to speak about this one, the good that is present in all things? Or rather, not? Why? Because this one is what is common, like the definition and the [result of the] induction. The definition means to state the substance of the given thing, whether what good is, or what bad is, or what something else is. The definition states that the such-and-such is universally good—the thing, whatever it is, that is choiceworthy because of itself; while the good present in all things tallies with this

3. *Republic* 436a–444a, 518d–519a.
4. I.e., the *Republic*, especially 585b–588a.
5. The former being a matter for a theoretical science, the latter for a practical one.

definition. And the definition says what good is. **14.** But no science or capacity says about its own end that it is good; rather, this is for another capacity to get a theoretical grasp on. For neither the doctor nor the builder says either that health or a house is good; rather, the one states that he produces health, the other a house, and in what way he produces it. **15.** Therefore, it is clear that it is not for politics either to speak about the good that is common. For it too is a science among the rest, and, as we saw, it belongs to no science or capacity to state that its end is this. Therefore, it is also not for politics to speak about the common good that is in accord with the definition.

16. Nor again about the one that is common in accord with induction. Why? Because when we wish to prove that something is among the particular goods, either we prove by means of the definition that the same account fits both the good and this thing that we wish to prove is good, or else by means of induction. For example, if we wish to prove that greatness of soul is good, we say that justice is good, and courage, and the virtues generally; but greatness of soul is a virtue; so greatness of soul too is **1183^{a}1** good. **17.** Nor, then, must politics speak about the good that is common in accord with induction, because the same impossible things will result for it as for the good that is in accord with the definition. For here too it will say that [the end] is good.

It is clear, then, that what politics must speak about is the best good, and by the best one [I mean] the best one for us. **18.** And, in general, one can see that it belongs to no single science or capacity to investigate every good. Why? Because the good is present in every category. For it is present in the what[-it-is], in quality, in quantity, time, relative, and in all of them generally. **19.** But in medicine it is the doctor who knows the good in time, in navigation the captain, and in each one the given person. For the doctor knows the time one must cut and the captain the time one must sail. And in each science the given person will know the time that is good in it. For the doctor will not know the time that is good in navigation, nor the captain the one in medicine. Therefore, it must not speak in this way even about the good that is common. For the one in time is common[6] to all of these sciences. **20.** Similarly, the relative good and the one that corresponds to the other categories are also common to all of them, and it does not belong to any capacity or science to speak of what is good[7] in all sciences, nor, again, does it belong to politics to speak about the good common [to them]. [It belongs to it to speak,] therefore, about the good, about the best one, and about the best one for us.

21. Nor, presumably, when one wishes to prove something, must one use paradigms that are not evident, but rather evident ones in place of non-evident ones, and perceptible ones in place of intelligible ones. For these are most evident. When, then, one undertakes to speak about the good, one must not speak about the Form. **22.** And yet they,[8] at any rate, think that, whenever they speak about the good, they

6. Omitting ἐν.
7. Omitting πότε.
8. Platonists.

must speak about the Form. For they say that they must speak about what is most of all good; but each F-itself is what is most of all F; so the Form, they think, would be most of all good. **23.** An argument of this sort is perhaps true, but the science or capacity of politics, which the present account is about, does not investigate this good, but rather the good for us. For no science or capacity says of its end that it is good, so that politics does not do so either. That is why the account it produces is not about the good that is in accord with the Form.

24. "But perhaps," [an objector] says, "using this good as a starting-point, I will, advancing from it, speak about the particular goods." But even this is not correct. For one must take starting-points that properly belong to them. For it is absurd, if one wishes to prove that the triangle contains two right angles, to take as starting-point that the soul is immortal. **25.** For it does not properly belong [to the triangle], while the starting-point must properly belong and be followed from it. But as things stand, even without the soul's being immortal, one will be able to prove that the triangle contains two right angles. **26.** Similarly, in the case of goods too, it is possible to get a theoretical grasp on the others without the one that is good in accord with the Form [of the good].[9] {Nor was Socrates correct when he made the virtues sciences. For he thought that nothing should be pointless, but from the virtues being sciences it follows that, for him, the virtues are pointless. Why? Because in the case of the sciences it follows that one simultaneously knows what the science is and is possessed of scientific knowledge. **27.** For if someone knows what medicine is, he is immediately a doctor, and it is the same way too in the case of the other sciences. But this does not follow in the case of the virtues. For it is not the case that if someone knows what justice is, he is immediately just, and the same way with the others. It follows, then, that the virtues are pointless, and are not sciences.}[10]

1.2
Divisions of Goods

1. Since these things have been determined, let us try to say in how many ways things are said to be good. For among goods, some are estimable, others praiseworthy, others capacities. By "estimable" I mean things of the following sort: the divine, the better (for example, soul, understanding), the more ancient, the starting-point, and things of this sort. For those things are estimable on which honor is based, and honor follows along with all such things. Virtue, then, is also something estimable—certainly, at any rate, when someone has become excellent due to it; for at that point he already has the shape of virtue. **2.** Praiseworthy things are, for example, the virtues. For it is from actions done in accord with these that praise comes about. Capacities are, for

9. Omitting διὸ . . . τἀγαθοῦ ("which is why [he thinks that] the starting-point consisting of this good is not appropriate").
10. This passage seems out of place.

example, ruling office, wealth, strength, beauty. For these are things that the excellent person has the capacity to use well, the base person badly. That is why such goods are called "capacities." **3.** They are indeed good things (for each of them is put to the test by the excellent person's use, not the base person's); but it is a coincidental attribute of these same things that they are good,[11] and luck is the cause of their coming about. For it is due to luck that wealth comes about, and ruling office, and, in general, everything that has the rank of capacity. **4.** The fourth and last of the goods is what is preservative and productive of good, as athletic training is of health, and anything else of this sort.

5. But goods admit of yet another division: some of them are in every circumstance and in every way choiceworthy, while others are not. For example, justice and the other virtues are in every circumstance and in every way choiceworthy, while strength, wealth, capacity, and things of this sort are neither in every circumstance nor in every way so. **1184^{a}1**

6. Further, there is another way [of dividing them]. For some goods are ends, while others are not ends—for example, health is an end, while things that are for the sake of health are not ends. And whenever things stand in this relation, the end among them is always better (for example, health is better than healthy things), and unconditionally, always, and universally that thing is in fact better that the others are for the sake of.

7. Again, among ends themselves, the complete is always better than the incomplete. And a complete end is one that, when we have acquired it, we need nothing else in addition, while an incomplete one is one that, when we have acquired it, we do need something in addition—for example, when we have acquired justice alone[12] we need many things in addition, but when we have happiness we need nothing further in addition. Therefore, this is the best one for us, the one we are seeking, the one that is the complete end. The complete end, then, is the good and the good is the end.[13]

8. The next issue, then, is how must we investigate the best good? Is it itself to be counted among the others? But this is absurd. For since the best good is a complete end, and the complete end, simply speaking, would seem to be nothing other than happiness, and happiness is composed of many goods, then, if when investigating the best, one were also to count it among the others, it will be better than itself. For it itself is the best one. For example, take healthy things and health, and investigate which of all these is best. The best is health. If, then, it is better than all these,[14] it is also better than itself. An absurdity, then, results.

9. This, at any rate, is presumably not the way to investigate the best one. But [are we, then, to investigate it] in this way, at least—as separate from these goods?[15] Or

11. Reading τούτοις.
12. Reading μόνης.
13. Reading τὸ ἀγαθόν.
14. Reading τούτων.
15. Reading αὐτῶν.

is this also absurd? For happiness is composed of certain goods, and to investigate whether it is better than the goods of which it is composed is absurd. For happiness is not something separate from the things of which it is composed,[16] but is these.

10. Could one correctly investigate the best one in the following way, at least: by comparison? For example, by comparing happiness itself, which is composed of these goods, to other goods that are not present in it, would one, by investigating in this way, investigate the best good correctly? But the best good we are now seeking is not simple. For example, someone might say that practical wisdom is the best of all goods when they are compared one by one. **11.** But presumably this is not the way one must seek the best good. For we are seeking the complete good, and practical wisdom is not complete when it is alone. So it is not the best good that we are seeking, nor one that is best in this way.

1.3
Happiness

1184b1 **1.** Next, then, goods admit of another division. For some goods are in the soul—for example, the virtues; some in the body—for example, health, beauty; and some external—wealth, ruling office, honor, and anything else of this sort there may be. Of these, the ones in the soul are best. **2.** And the goods in the soul are divided into three: practical wisdom, virtue, and pleasure.

What at this point comes next, then, is the thing that we all say is—and that seems in fact to be—the end of the [other] goods, and the most complete one: happiness. And it, we say, is the same as doing well and living well. **3.** But the end is not simple but rather twofold; for of some things the end is the activity itself and the use—for example, the activity of sight is seeing.[17] And the use of something is more choiceworthy than the state.[18] For the use is the end. For no one would wish to have sight if he was not going to see but to have his eyes shut. It is the same way in the case of hearing and things of this sort. **4.** Therefore, among things of which there is a use and a state, the use is always better and more choiceworthy than the state. For the use and activity are the end, while the state is for the sake of the use.

5. Next, if one examines it in the case of all the sciences, one will see that a house is not made by one science that makes a house, and an excellent house by another, but rather [both] by the craft of building. And what the builder is able to produce is that very thing that his virtue is also able to produce.[19] It is the same way the case of all the others.

16. Reading χωρὶς τῶν ὑφ᾽ ὧν.
17. Reading ἐστιν ἡ ὅρασις.
18. I.e., of having it. See *Met.* 5.20.
19. Rejecting εὖ.

1.4
Happiness and Virtue

1. Next, we see that we live by nothing other than the soul; and in the soul there is virtue; and we say, surely, that the soul and the virtue of the soul produce the same thing. But the virtue in each thing produces well what the thing of which it is the virtue [produces], and though the soul also [produces] other things, it is by the soul that we live. Therefore, it is by means of the virtue of the soul that we will live well. **2.** But living well and doing well are, we say, nothing other than being happy. Therefore, being happy and happiness consist in living well, and living well consists in living in accord with the virtues. Therefore, this is the end, happiness, and the best [good]. **3.** It is in some use and activity, accordingly, that happiness would consist. For of things of which there is both a state and a use, as we saw,[20] the use and activity are the end. But virtue is a state of the soul. And there is an activity and use of the state's virtues. So the activity and use of it would be the end. Therefore, happiness would consist in living in accord with the virtues.

4. Since, then, the best good is happiness, and happiness is the end, and the complete end in activity, it would be by living in accord with the virtues that we would be happy and would have the best good.

5. Since, then, happiness is the complete good and end, we must not overlook the **1185^{a}1** fact that it will be present in what is complete. For it will not be present in a child (for a child is not happy), but in a man; for he is complete. Nor will it exist in an incomplete time, but in a complete one. And a complete one is the time of a human life. For it is correctly said among ordinary people that a life's happiness should be judged in its longest time, on the supposition that what is complete should exist in a complete time and a complete human being.

6. That happiness is an activity one can see also from the following: if someone were to pass his entire life lying in slumbers, no one would wish to say that such a person is happy; for, though life belongs to him, life in accord with the virtues—the one that we saw[21] to be in accord with activity—does not belong to him.

7. The next thing we are going to speak about might seem neither to very properly belong to our subject nor to be greatly far removed from it. I mean, since there is, as it seems, a part of the soul whereby we are nourished, which we call "nutritive"—(for it stands to reason that it exists; at any rate, we see that stones are incapable of being nourished; so it is clear that to be nourished is characteristic of animate things; and if it is characteristic of animate things, the soul would be its cause; **8.** but none of these parts of the soul—I mean the rationally calculative, the spirited, the appetitive—could be a cause of nourishing, but rather something else beyond these, for which we have no name that more properly belongs to it than "nutritive")—**9.** someone might say, "well

20. 1184^{b}14–16.
21. 1184^{b}34–36.

then, is there also a virtue of this part of the soul?" For if there is, it is clear that with respect to it too the soul will need to be active. For happiness is the activity of complete virtue. Whether or not there is a virtue of this part is for another account.[22] But if there is, there will be no activity of it. For of things where there is no impulse, there will be no activity either. And there seems to be no impulse in this part, but rather it seems to be like fire. For in its case too, whatever you throw into it,[23] it will devour, but if you do not throw something in, it has no impulse to get it. So it is too with this part of the soul. For if you throw in nourishment, it nourishes, but if you do not throw in nourishment, it has no impulse to nourish. That is why there is no activity of what there is no impulse of either. So this part does not even contribute to happiness.[24]

10. Next, then, we must say what virtue is, since the activity of it is happiness. To put it simply, then, virtue is the best state. But presumably it is not enough to put it so simply, but we must define it more perspicuously.

1.5
Parts of the Soul and Their Virtues; How the Virtues of Character Are Destroyed

1185b1 **1.** First, then, we must speak about the soul in which virtue arises—not about what the soul is (for to speak about this is for another account), but to determine it in outline. The soul, as we say, is divided into two parts, into the part that has reason and the non-rational part. In the part that has reason, then, these things are practical wisdom, acumen, theoretical wisdom, ease at learning, memory, and the like; in the non-rational part, those that are called "virtues": temperance, justice, courage, and whatever other things belonging to character seem to be praiseworthy. **2.** For it is in accord with these that we are said to be praiseworthy; but with respect to those of the part that has reason no one is praised. For no one is praised because he is theoretically wise, nor because he is practically wise, nor, in general, in accord with anything of this sort. Nor indeed is the non-rational part praised unless it is subservient to, and serves, the part that has reason.

3. Virtue of character is destroyed by deficiency and by excess. And that deficiency and excess destroy it is possible to see from outside the sphere of ethics,[25] though on behalf of non-evident cases evident ones must be used as testimony. For one can see this at once in the case of physical exercises. For strength is destroyed by too much, and likewise by too little. **4.** It is the same way too in the case of drink and food. For when there is too much, health is destroyed, and likewise when there is too little. But when it is proportional strength and health are preserved. Things like these also

22. *NE* 1102a26–b12.
23. Reading ἐκείνῳ.
24. Reading οὐδὲ.
25. Reading ἔξω τῶν ἠθικῶν.

happen in the case of temperance, courage, and the other virtues. For if you make someone too fearless, so that he does not fear even the gods, he is not courageous but mad, while if you make him afraid of everything, he is a coward. **5.** Therefore, a courageous person will neither be the one who fears everything nor the one who fears nothing. Therefore, these are the things that increase and destroy the virtue. For fearing too much, and being afraid of everything,[26] destroys it, as likewise does being afraid of nothing. But courage is concerned with fears, so that moderate fears increase courage. Therefore, courage is increased and destroyed by the same things. For this is how people are affected by fears. It is the same way too in the case of the other virtues.

1.6
Pain, Pleasure, and Habituation

1. Further, it is not only by these sorts of things that one should determine the virtues, but also by pain and pleasure. For it is because of pleasure that we do base actions, and because of pain that we abstain from noble ones. And, in general, it is not possible to get hold of virtue and vice without pleasure and pain. Virtue, then, is concerned with pleasures and pains.

2. Ethical virtue derives its names from this, if it is by the spoken letter that we must investigate in what way the truth lies (as perhaps we must). For character (*êthos*) derives its name from habit (*ethos*). For it is called "ethical (*êthikê*)" because of **1186ᵃ1** resulting from habituation (*ethizesthai*). **3.** From which too it is clear that none of the virtues of the non-rational part appear in us by nature. For none of the things that are by nature becomes otherwise by habit. For example, a stone, and heavy things in general, spatially move downward by nature. If one threw them upward many times, then, and tried to habituate them to spatially move upward, nonetheless they would never spatially move upward, but always downward. It is the same way too in the case of the other things of this sort.

1.7
Feelings, Capacities, and States; the Mean

1. Next, as we wish to say what virtue is, we must know what the things are that come about in the soul. The things that come about are these: feelings, capacities, states. So it is clear that virtue would be one of these.

2. Feelings are anger, fear, hatred, longing, jealousy, pity, and things of this sort, which are usually followed by pain or pleasure. Capacities are those things in virtue of which we are said to be susceptible to these feelings—for example, those things in

26. Reading πάντος.

virtue of which we are capable of feeling anger, pain, pity, and[27] things of this sort. **3.** States are those things in virtue of which we are well or badly disposed in relation to feelings—for example, in relation to feeling anger, if we are too irascible, we are badly disposed in relation to anger, while if we are not angry at all at the things we should, we are in this way too badly disposed in relation to anger. Therefore, the mean state is neither to feel too much pain [when angry] nor to be entirely insensitive to pain.

4. When we are in this state, then, we are well-disposed (likewise too[28] in relation to other things like this); for good-temper and mild-manneredness are in a state that is a mean between anger and insensitivity to the pain in relation to anger. It is the same way too[29] in the case of boastfulness and self-deprecation. For to pretend to have more than one has is boastfulness, while to pretend to have less is self-deprecation. Therefore, the mean state between these is truthfulness.

1.8
More on Feelings and the Mean

1. It is the same way too in the case of all the other feelings. For this is what is characteristic of a state, being well or badly disposed in relation to these. And to be well-disposed in relation to them is to be disposed neither toward excess nor toward deficiency. Therefore, the state of being well-disposed is directed toward a mean in the sorts of things with regard to which we are said to be praiseworthy, while that of being badly disposed is directed toward excess or deficiency. **2.** Since, then, virtue is a mean state of these feelings, and feelings are either pains or pleasures, or not without pain or pleasure, it follows that virtue is concerned with pains and pleasures. From this too it is clear.

3. It might seem to someone that there are also other feelings, in which vice does not consist in an excess or deficiency of any sort—for example, adultery[30] and the adulterous person; for[31] the adulterous person is not the one who corrupts free women too much. But both this and anything else of this sort, that encompasses intemperate pleasure, both the one in deficiency and the one in excess, are blameworthy.

1.9
Excess, Deficiency, and the Mean

1. Next, it is necessary, presumably, to say what—whether the excess or the deficiency—is opposed to the mean state. For to some mean states the deficiency is

27. Retaining καὶ.
28. Retaining καὶ.
29. Retaining καὶ.
30. Reading ἡ μοιχεία.
31. Reading οὐ γὰρ.

opposed and to some the excess. For example, to courage it is not rashness, which is an excess, that is opposed, but cowardice, which is a deficiency; and to temperance, which is a mean state between intemperance and insensitivity to pleasure, it does not seem that insensitivity, which is a deficiency, is opposed, but intemperance, which is an excess. **2.** Both, however, are contrary to the mean state, both the excess and the deficiency. For the mean state is more deficient than the excess, but exceeds the deficiency. That is also why wasteful people say that generous ones are ungenerous, while ungenerous ones say that generous ones are wasteful, and why rash and impetuous people say that courageous people are cowards, while cowards say that courageous ones are impetuous and mad.

3. It would seem to be due to two causes, then, that we oppose the excess and the deficiency to the mean state. For one way is based on the thing itself, when we inquire as to which is closer to the mean or further away—for example, whether wastefulness or ungenerosity is further away from generosity. For wastefulness would seem to be more like generosity than ungenerosity does. Therefore, ungenerosity is further away. **4.** And things further away from the mean would seem to be more contrary to it. Therefore, based on the thing itself, the deficiency seems to be more contrary. But there is also another way, that the things we are naturally more inclined to are the ones that are more contrary to the mean. For example, we are naturally more inclined to be intemperate than moderate. Our growth, then, is more toward what we are naturally inclined to. And the things we more grow toward are the ones that are more contrary. We more grow toward intemperance than toward moderation. So [what is in] excess of the mean would be more contrary. For intemperance is excess of temperance.

5. What virtue is, then, has been investigated. For it seems to be a certain mean state of the feelings. So it would be necessary for the person who is going to enjoy a good reputation for his character to maintain the mean state in each of his feelings. **6.** That is why indeed it takes work to be excellent. For in each area getting hold of the mean (*meson*) takes work—for example, everyone can draw a circle, but to then get hold of the mid-point (*meson*) in it is difficult. Likewise too, while being angry is easy, as is the contrary of this, to be in a mean is difficult. Putting it simply, in each of the **1187ª1** feelings one can see that what encompasses the mean[32] is easy, while the mean—the thing for which we are praised—is difficult. That is also why what is excellent is rare.

7. Since, then, virtue has been spoken about, we must next investigate whether it is possible to attain it or not, but rather, as Socrates said,[33] coming to be virtuous or being base is not up to us. For if, he says, one were to ask anyone whatever whether he would wish to be just or unjust, none would choose injustice. **8.** Likewise in the case of courage, cowardice, and the other virtues, it is always the same way. And it is

32. Reading μὲν περιέχον. I.e., the deficiency on one side and the excess on the other.
33. E.g., *Meno*, 78a, *Sophist* 228c, *Timaeus* 86d–e.

clear that if some people are base, they cannot be base voluntarily. So it is clear that they cannot be excellent voluntarily either.

9. This sort of argument is not true. For why does the legislator not allow the doing of base actions, and order the doing of noble and excellent ones? And why does he assign a penalty for base ones, if one does them, and for noble ones, if one does not do them? And yet it would be absurd to legislate about things that are not up to us to do. **10.** But, as it seems, it is up to us to be excellent or base. Further, the praises and blames that result testify to this. For there is praise for virtue and blame for vice. But praise and blame are for voluntary things.[34] So it is clear that it is alike up to us to do both excellent things and to do base ones.

11. People wishing to prove that vice is not voluntary also drew a comparison of the following sort. For why, they say, when we are ill or ugly, does no one blame people of this sort? But this is not true. For we do blame people of this sort, when we think that they themselves are the causes of their being ill or of having their body in a bad state, on the supposition that even there the voluntary is present. It seems, then, that the voluntary is present in our being in accord with virtue and with vice.

1.10
Starting-Points

1. Further, one can also see this more clearly from the following considerations. For every nature generates a substance of the same sort as itself—for example, plants and animals; for both are generative. And they are generative from starting-points—for example, the tree from seed; for this is a sort of starting-point. And what follows the starting-points is like this; for as the starting-points are so also are the things that follow the starting-points.

2. One can see this more clearly in the case of geometry. For there too when certain things are taken as starting-points, as starting-points are so also are the things that follow the starting-points—for example, if the triangle has angles equal to two right angles, the quadrilateral has angles equal to four, and as the triangle changes, so too the quadrilateral changes with it. For it is convertible—that is, if the quadrilateral does not have its angles equal to four right angles, neither will the triangle have its angles equal to two right angles.

1.11
Starting-Points of Voluntary Action

1. It is this way, then, and like these cases, in the case of a human being too. For since a human being is generative of a substance, it is from certain starting-points too that

34. Omitting οὐκ and reading ἑκουσίοις.

he is generative of the actions a human being does. For what else could do so? For we do not say that any of the inanimate things do actions, nor any of the animate ones, except human beings. It is clear, then, that a[35] human being is generative of actions.

2. Since, then, we see actions changing, and we never do the same ones, and the actions have been generated from certain starting-points, it is clear that, since the actions change, the starting-points of the actions, from which they come, change too, just as we said in the case of the ones in geometry.

3. But the starting-point of an action, both of an excellent one and of a base one, is deliberate choice and wish, and all of what is in accord with reason. Therefore, it is clear that these too change. But we also change in our actions voluntarily; so the starting-point—the deliberate choice—also changes voluntarily. So it is clear that it would be up to us both to be excellent and to be base.

4. But perhaps someone might then say, "Since it is up to me to be just and to be excellent, if I wish it, I will be the most excellent of all." But this, of course, is not possible. Why? Because in the case of the body it is not possible either. For if someone wishes to take care of his body, it does not follow that he will have the best body of all. For not only must care be present, but also the body must be by nature noble and good. His body, then, will be better, but best of all it will not be. **5.** We must suppose it to hold in the same way also in the case of the soul; for the one who deliberately chooses to be most excellent will not be so unless the relevant nature is also present, but it will certainly be better.

1.12
The Voluntariness of Actions Due to Appetite

1. Since, then, it appears that to be excellent is up to us, it is necessary next to say about the voluntary, what the voluntary is. For this is a[36] most controlling factor when it comes to virtue.[37] The voluntary, to state it simply in this way, is what we do not under compulsion. But presumably we must speak more perspicuously about it.

2. What we act in accord with is desire. And of desire there are three forms: appetite, spirit, and wish.

First, then, we must investigate the action that is in accord with appetite to see whether it is voluntary or involuntary. But it would not seem to be involuntary. Why? On what grounds? Because whatever actions we do not do voluntarily we do[38] under **1188^{a}1** compulsion, and everything we do from compulsion is accompanied by pain. But with those we do because of appetite pleasure follows along. So, to this extent at least, actions done because of appetite would seem to be not involuntary, but voluntary.

35. Omitting ὁ.
36. Omitting τὸ.
37. Omitting τὸ ἑκούσιον.
38. Reading ποιοῦμεν.

3. But, again, there is another argument contrary to this, the one depending on lack of self-control. For no one, it says, voluntarily does bad actions, knowing that they are bad. Yet the person who lacks self-control, it says, knowing that the things are base, does them nonetheless, and does them indeed in accord with appetite. Therefore, he does not do them voluntarily. Therefore, he does them under compulsion. **4.** But here again the same argument will meet it. For if in fact he does them in accord with appetite, he does not do them from compulsion. For with appetite pleasure follows along, and what we do because of pleasure, we do not do from compulsion.

And there is another way in which this—that the person who lacks self-control acts voluntarily—may be made clear. For those who do injustice do injustice voluntarily, and those who lack self-control are unjust and act unjustly. So the person who lacks self-control would do voluntarily the actions that he does in accord with his lack of self-control.

1.13
The Voluntariness of Actions Due to Appetite, to Spirit, and to Wish

1. But, again, there is another argument contrary to this, which claims that [action in accord with appetite] is not voluntary. For the self-controlled person does voluntarily what he does in accord with his self-control; for he is praised; and people are praised for what is voluntary. But if what is in accord with appetite is voluntary, what is contrary to appetite is involuntary; and the self-controlled person acts contrary to appetite. So the self-controlled person would not be self-controlled voluntarily. But that does not seem to be so. Therefore, what is in accord with the[39] appetite is not voluntary either.

2. Again, it is the same way in the case of what is in accord with spirit; for the very same arguments apply as also apply to appetite, so that they will produce the [same] puzzle. For it is possible for someone to lack self-control and have self-control pertaining to anger.

3. Further, among the desires we distinguished, it remains to investigate wish, to see whether it is voluntary. But surely those who lack self-control, at any rate, wish at the time for what they are impelled toward. Therefore, those who lack self-control do base actions while wishing to do them. But no one voluntarily, at any rate, does bad things while knowing them to be bad. But the person who lacks self-control, while knowing that the bad things are bad, does them wishing to do so. Therefore, he is not doing them voluntarily. Therefore, wish is not voluntary either. **4.** But this argument does away with lack of self-control and the person who lacks self-control. For if he is not acting voluntarily, he is not blameworthy. But the person who lacks self-control is blameworthy. Therefore, he acts voluntarily. Therefore, wish is voluntary.

Since, then, certain arguments appear to be contraries, something more perspicuous must be said about the voluntary.

39. Reading τὴν.

1.14
Force and Compulsion (1)

1. First, then, we must speak about force and about compulsion. For force exists even in inanimate things. For to each[40] of the inanimate things a proper place is assigned—to **1188^{b}1**
fire the upper one, to earth the lower. Yet it is possible to force a stone to spatially move upward and fire downward. **2.** It is also possible to force an animal [to do something]—for example, when a horse is running straight ahead, to turn it aside by taking hold of it. 5
Whenever, then, the cause of their doing something contrary to nature, or contrary to what they wish to do, is external, we will say that they are forced[41] to do what they do. But whenever the cause is within themselves, we will no longer say that they are forced. **3.** Otherwise, the person who lacks self-control will contradict us, saying that he is not base; for he will say that he is forced by his appetite to do base things. 10

1.15
Force and Compulsion (2)

1. Let this, then, be our definition of what involves force: those things of which the cause of being forced to do them is external (but where the cause is internal and within the agents themselves there is no force). And we must again speak about compulsion and the compulsory. Compulsion is not something we must speak of in all circumstances and in everything—for example, in what we do for the sake of 15
pleasure. For if someone were to say, "I was compelled by pleasure to corrupt my friend's wife," it would be absurd.[42] **2.** For compulsion is not found in everything, but in fact in things that are external—for example, if someone were compelled by circumstances to incur one harm in exchange for another greater one. For example, 20
"I was compelled to proceed more eagerly to the country; for otherwise I would have found the crops destroyed." Compulsion, then, is found in things of this sort.

1.16
The Voluntary Is What Proceeds from Thought

1. But since the voluntary is found in no impulse, what proceeds from thought would 25
remain. For the involuntary is what is done in accord with compulsion, in accord with force, or, thirdly, what is not done with thought. This is clear from the facts. For when someone hits or kills someone, or does anything of this sort, without having

40. Reading ἑκάστῳ.
41. Reading βιαζομένους.
42. Reading ἄτοπον.

thought about it beforehand, we say that he acted involuntarily on the supposition that the voluntary is found in the having thought. **2.** For example, they say that a woman once gave someone a love-potion to drink, then the man died due to the love-potion, and the woman was put on trial before the Areopagus. Having come before it, she was acquitted, because of nothing other than absence of forethought. For she gave it for love, but failed utterly in this. That is why it did not seem to be voluntary, because she gave him the dose of love-potion not with a thought of killing him. Therefore, in that case the voluntary falls into what is [done] with thought.

1.17
Deliberate Choice

1189a1 **1.** It further remains for us to investigate deliberate choice, as to whether or not it is desire. For while desire is found also in the other animals, deliberate choice is not. For deliberate choice involves reason, and reason is not present in any of the other animals. It could not, then, be desire.

2. But is it wish, at least? Or is it not this either? For wish is also for impossible things—for example, we wish to be immortal, but we do not deliberately choose to be. Further, deliberate choice is not of the end, but of what furthers the end—for example, no one deliberately chooses to be healthy, rather, we deliberately choose the things (walking, running) that further health. But we do wish for ends. For we wish to be healthy. **3.** So it is clear in this way too that wish and deliberate choice are not the same thing.

Deliberate choice does seem to be the way its name[43] (*prohairesis*) also suggests. For we deliberately choose one thing in place of (*anti*)[44] another—for example, the better in place of the worse. When, then, we can opt for the better in place of the worse in making a choice, there "deliberate choice" would seem to properly belong.

4. Since, then, deliberate choice is none of these things, is it in what is in accord with thought, at least, that deliberate choice is found? Or is it not this either? For we think and believe many things in accord with thought. Are the things we think about, then, also the ones we deliberately choose? For we often think about things in India, but we do not in fact deliberately choose any of them. Therefore, deliberate choice is not thought either.

5. Since, then, deliberate choice is none of these things, taken severally, but these are the things that take place in the soul, it is necessary for deliberate choice to be a combination of some of these. Since, then, as was said before,[45] deliberate choice is of goods that further the end, not of the end, of things that are possible for us, and of things that provide grounds for dispute as to whether this or that is more

43. Reading τοὔνομα.
44. *Anti* means much the same as *pro*.
45. 1189a7–8.

choiceworthy,[46] it is clear that we must first think and deliberate about them, and then, when one appears better to us, after having thought it over, there is an impulse to act in this way, and when doing this, then, we seem to be acting in accord with deliberate choice.

6. If, then, deliberate choice is a deliberative desire involving thought, what is voluntary is not what admits of deliberate choice. For we do many actions voluntarily before having thought and deliberated—for example, we sit down, stand up, and do many other things of this sort voluntarily without thinking, but things done in accord with deliberate choice, we saw,[47] are all done with thought. **7.** Therefore, what is voluntary is not what admits of deliberate choice, but what admits of deliberate choice is voluntary. For if we deliberately choose to do something after deliberating, **1189^{b}1** we act voluntarily. And even among legislators a few appear to distinguish what is voluntary as being something other than what is done from deliberate choice, in assigning lesser penalties for voluntary actions than for those in accord with deliberate choice.

8. Deliberate choice, then, is found in matters of what is doable in action, and in those in which it is up to us either to act or not to act, in this way or not in this way, and in which it is possible to grasp the why. But the why is not simple. **9.** For in geometry, when one says that the quadrilateral has angles equal to four right angles, and someone asks why, one says, "because the triangle also has angles equal to two right angles." In cases of this sort, then, we reach[48] the why on the basis of a definite starting-point. But in matters of what is doable in action, in which deliberate choice is found, it is not this way (for there is no definite starting-point laid down), and if one asks, "Why did you do this?" the answer is, "Because there was no other way," or "Because it was better this way." Whichever[49] of the consequences appears to be better, this is what he deliberately chooses, and [does so] because of it. **10.** That is why, then, in these matters deliberating is deliberating how one should do things, while in the sciences it is not. For no one deliberates about how one should write the name "Archicles," because how one should write the name "Archicles" is something definite. Error, then, does not occur in thought, but in the activity of writing. For in cases in which error[50] is not in thought no one deliberates either. On the contrary, it is only in those cases in which how one should do things is indefinite that error comes in.

11. In matters of what is doable in action, however, there is this indefiniteness, and in those in which errors are twofold. We err, then, in similar ways in matters of what is doable in action and in ones that are in accord with the virtues. For in aiming at virtue we err in the natural directions. For it is both in deficiency and

46. Reading αἱρετώτερον.
47. 1.16.
48. Reading ἐλάβομεν.
49. Omitting ἐξ and the comma after συμβαινόντων and reading ὁποῖον and τοῦτον.
50. Omitting ἡ.

in excess that error is found, and we are carried toward each of them because of pleasure and pain; for because of pleasure we do base actions and because of pain we avoid noble ones.

1.18
Ends and What Furthers Them

1. Further, thought is not like perception—for example, with sight one cannot do anything other than see, nor with hearing anything other than hear. Similarly, we do not deliberate about whether we should hear with hearing or see with it. But thought is not like that, but is able to do both this and other things. That is why deliberation[51] comes in here from the start. **2.** Error in choosing good things, then, is not concerning ends (for everyone agrees about these—for example, that health is good), but in fact about what furthers the end—for example, about whether eating this is good for health or not. And what most of all makes us fail in these matters is pleasure and pain; for we avoid the latter and choose the former.

3. Since, then, it has been determined in what error is found and in what way, it remains to determine what virtue aims at, whether at the end or at what furthers the end—for example, whether at the noble or at what furthers the noble.

4. How is it, then, with science? Does it belong to the science of building to set up the end correctly, or to see what furthers the end? For if this is set up correctly, for example, to make a noble house, then no one else besides the builder will also discover and provide what furthers it. It is the same way too in the case of all the other sciences.

5. Therefore, it would seem to be likewise in the case of virtue too, that its target is more related to what furthers the end, which it must set up correctly, than to the end.[52] And no one other than [the virtuous person] will provide the things this will come from, or discover what is needed to further it. But it is also reasonable that virtue be capable of setting up the end wherever the starting-point is of the best thing; for[53] each [science and virtue] is capable both of setting it up and producing it. Nothing, then, is better than virtue. For the other things are for its sake, and the starting-point is in relation to virtue; and what furthers the end is more for the sake of it. **6.** But the end seems to be a sort of starting-point, and each thing is for the sake of it. And it is reasonable that it will be. So it is clear in the case of virtue too that, since it is the best cause, it aims at the end more than at what furthers the end.

51. Reading τὸ βουλεύεσθαι.
52. Reading τὸν σκοπὸν πρὸς τὰ πρὸς τὸ τέλος . . . ἢ πρὸς τὸ τέλος.
53. Reading τὴν ἀρετήν, ἐν οἷς ἡ ἀρχὴ τοῦ βελτίστου ἐστίν. ἕκαστον γὰρ καὶ. . ..

1.19
Virtue's End Is the Noble

1. But of virtue, at any rate, the end is the noble. Therefore, this is what virtue will aim at more than the things this will come from. Yet it is also concerned with these. For these, then,[54] to be its whole concern is manifestly absurd. For presumably in painting someone might be a good imitator of things and yet not be praised, if he did not set up as his target to imitate the best things. Therefore, this is entirely the concern of virtue, to set up the noble.

2. Why, then, someone might ask, did we say previously[55] that the activity is better than the state itself,[56] while now we are assigning to virtue as something nobler, not what the activity comes from, but what there is no activity present in? **3.** Yes, but now too we equally assert this, that the activity is better than the state. For when other people look at the excellent person, they judge him on the basis of the actions he does, because it is not possible to make clear a given person's deliberate choice, since if it were possible to know how a given person's consideration stands in relation to the noble, he would have seemed excellent even without his doing any actions.

Since we enumerated[57] the mean states of certain feelings, we must state what sorts of feelings they are concerned with.[58]

1.20
Courage

1. Since, then, courage is concerned with feelings of confidence and fear, we must investigate what sorts of feelings of confidence and fear it is concerned with. If, then, someone is afraid of losing his property, is he a coward? And if someone is confident concerning such things, is he courageous? Surely not! Likewise, if someone is afraid or confident concerning illness, one must not say either that the one who is afraid is a coward or that the one who is not afraid is courageous. Therefore, it is not in feelings of fear and of confidence of these sorts that courage is found. **2.** But then it is not found in those of the following sorts either—for example, if someone is not afraid of thunder, lightning, or any other object of fear that is beyond the human level, he is not courageous, but a sort of mad person. It is in cases of feelings of fear and confidence that are on a human level, then, that the courageous person is found.

54. Reading τε δὴ.
55. $1184^{b}15$–16, 33–35.
56. Reading τὴν ἕξιν αὐτήν.
57. $1185^{b}21$–32, $1186^{b}4$–12, 32.
58. Retaining ἐπεὶ . . . εἰσίν.

I mean, for example, in things many people, or all people, are afraid of—the one who is confident in these things is the one who is courageous.[59]

3. With these matters determined, then, we must, since courageous people are so in virtue of many things, investigate what sort of person the courageous person is. For it is possible for someone to be brave in virtue of experience—for example, soldiers. For they know because of experience that in such-and-such a place, or at such-and-such a time, or in such conditions it is impossible to suffer any damage. But the one who knows these things, and because of them endures the enemies is not courageous. **4.** For if none of these things obtains, he will not endure.[60] That is why one should not call "courageous" those who are so because of experience. But[61] nor did Socrates speak correctly when he said[62] that courage is scientific knowledge. For scientific knowledge becomes scientific knowledge by getting experience from habit. But we do not say, and nor will people say, that those who endure because of experience are courageous.[63] Therefore, courage would not be scientific knowledge.

5. Again, there seem to be[64] some, on the other hand, who are courageous from the contrary of experience. For those who have no experience of what is likely to happen are not afraid—because of their inexperience. Neither, then, must we say that these people are courageous.

6. Again, there are some who seem courageous because of their feelings—for example, those who are in love or possessed by a god. We must not say, then, that these are courageous either. For if the feeling is taken away, they are no longer courageous, while the courageous person must always be courageous. **7.** That is why one would neither say that wild beasts, such as boars, are courageous because they defend themselves, since they do so when they are in pain due to being struck, nor should a courageous person be courageous because of feeling.

8. Again, there seems to be another sort of courage, which seems to be political—for example, if people endure dangers because of shame in front of the citizens, and so seem to be courageous. A sign of this is that Homer represents Hector in his poem as saying:

> Polydamas will be the first to heap disgrace on me.[65]

That is why he thinks he must fight. This sort, then, must not be said to be courage either. For the same definition will apply to each of them. For one whose courage does not endure when something is taken away will not be courageous any longer. If,

59. Reading ἅ πάντες, ὁ ἐν. . ..
60. Reading ὑπομενεῖ.
61. Reading δέ.
62. E.g., Plato, *Laches* 199a–b.
63. Omitting αὐτοὺς.
64. Reading δοκοῦσιν.
65. *Iliad* 22.100.

then, I take away the shame because of which he was courageous, he will no longer be courageous.

9. Further, there is also another way in which people seem to be courageous, because of hope and expectation of good. We must not say that these people are courageous either, since it is manifestly absurd to say that such people in such circumstances are courageous.

No one, then, of the above sorts must be set down as courageous. We must investigate, then, what sort is courageous, and who the courageous person is. **10.** Simply speaking, then, it is the one who is courageous because of none of the things mentioned, but because of his thinking it a noble thing, and doing it whether anyone is present or not.

Not, indeed, that courage arises entirely without feeling and impulse. But the impulse must come about from reason, because of the noble. For the one who is impelled to face dangers because of reason and for the sake of the noble, since he is free of fear concerning these, is the one who is courageous, and courage is concerned with these. **11.** But not "free of fear" in the sense that when a person happens to be courageous he feels no fear at all. For a person of that sort, to whom nothing is frightening, is not courageous. For in that sense a stone and other inanimate things would be courageous. But, though feeling fear, he must endure. For if, on the contrary, he endures without feeling fear, he would not be courageous.

12. Further, in keeping with the distinction we drew above, courage is concerned not with all fears and dangers, but only with those that threaten to do away with our existence. Further, not at any and every time, but when the fears and dangers are nearby. For if someone is not afraid of a danger that is ten years away, he is not yet courageous. For some are confident because of its being very far away, but when they come near it, they are ready to die of fear.

1.21
Temperance

1. Courage, then, and the courageous person are of this sort, while temperance is a mean state between intemperance and insensitivity concerning pleasures. For temperance—as, in general, all the virtues—is the best state; the best state is what has what is best; and what is best is the mean between excess and deficiency. For people $1191^{b}1$ are blameworthy with respect to both—both with respect to excess and with respect to deficiency. So that, if indeed the mean is best, temperance would be a sort of mean state between intemperance and insensitivity.

2. It would, then, be a mean state between these. But temperance is concerned with pleasures and pains—though not with all of them or those concerned with everything. For, it is not the case that if someone takes pleasure in looking at a picture or a statue or something else of this sort he is in this way, then, intemperate. Nor, in

the same way, is he so concerning hearing or smelling, but [only] in the pleasures of touch and taste.

3. Nor, then, will the man whose state is such that he is not affected by even a single pleasure of this sort be temperate concerning these (for a person of this sort is insensitive). Instead, the one who in fact does feel them, and is not so carried away by them that, by indulging in them to excess, he makes everything else to be secondary works, and who in fact acts for the sake of the noble itself and not anything else, is [the one we say is] temperate. **4.** For whoever avoids the excess of such pleasures either because of fear or because of something else of this sort is not temperate. For neither do we say that the various animals, except for a human being, are temperate, because they do not have the reason in them with which [human beings] examine[66] the noble and choose it. For all virtue is for the sake of the noble and with an eye to the noble.

So temperance would be concerned with pleasures and pains, and of these, the ones that arise in touch and taste.

1.22
Mild-Manneredness

1. The next thing would be to speak about mild-manneredness, what it is and in what it is found in. Mild-manneredness, then, is a mean between irascibility and spiritlessness. And, in general, the virtues seem to be certain sorts of mean states. And that they are mean states, one might also argue in this way: if the best is in a mean, and virtue is the best state, and the mean is best,[67] virtue would be the mean. **2.** But this will be clearer if we investigate them one by one.

For an irascible person is the one who gets angry with everyone, in all circumstances, and to too great an extent, and someone of this sort is blameworthy (for one should not get angry with everyone, at everything, in all circumstances, or always), nor again, contrariwise, should one be in such a state as never to get angry with anyone (for in fact such a person is blameworthy too, since he is insensitive). **3.** Since, then, the excessive one is blameworthy, as is the deficient one, the one in a mean between these would be mild-mannered and praiseworthy (for neither the one who is deficient in anger nor the one who is excessive is praiseworthy, but the one whose state in relation to these things is in a mean is the one who is mild-mannered), and mild-manneredness would be a mean in these feelings.

66. Reading δοκιμάζοντες.
67. Retaining βέλτιστον . . . μέσον.

1.23
Generosity

1. Generosity, for its part, is a mean state between wastefulness and ungenerosity. Feelings of this sort are concerned with money. For the wasteful person is the one **1192^{a}1**
who spends on what one should not, more than one should, and when one should not, while the ungenerous person, who does the contrary of this, is the one who does not spend on what one should, as much as one should, or when one should. **2.** Both are blameworthy. For one of them is blameworthy in the direction of deficiency and the other in the direction of excess. Therefore, the generous person, since 5
he is praiseworthy, would be in a mean between these,[68] who spends on what one should, as much as one should, and when one should.

1.24
Generosity and Ungenerosity

1. Of ungenerosity there are in fact several forms—for example, the ones we call "skinflints," "cheeseparers," "shameless lovers of profit," and "stingy people." All these 10
fall under ungenerosity. For the bad is multiform, while the good is uniform—for example, health is simple, while disease is multiform. Likewise, virtue is simple, while vice is multiform. For all these people are blameworthy where money is concerned.

2. Does it, then, belong to the generous person also to acquire and provide himself 15
with money? Surely not! For such things do not belong to any other virtue either. For it does not belong to courage to make weapons, but rather to something else, whereas it does belong to it, when it has got these, to make correct use of them. It is the same way in the case of temperance and the others. This, then, does not belong to generosity, but in fact to the craft of wealth acquisition. 20

1.25
Greatness of Soul

1. Greatness of soul is a mean state between conceitedness and smallness of soul, concerned with honor and dishonor, and with honor not from[69] many people but from excellent ones, and it should[70] rather be with this; for excellent people will bestow honor by knowing and judging correctly. The great-souled person will wish, then, rather to be honored by those who know, as he does himself, that he 25

68. Omitting τίς οὖν ἐστίν; ὁ. . . .
69. Omitting τῶν.
70. Reading δεῖ.

deserves honor. For he will not be concerned with every honor, but with the best, and with the good that is estimable and has the rank of a starting-point. **2.** Those people, then, who are despicable and base, but who think themselves worthy of great things, and in addition think they should be honored, are conceited; while those who think themselves worthy of less than what is fitting for them, are small-souled. **3.** The person, then, who is in a mean between these is the one who neither thinks himself worthy of less honor than is fitting for him, nor of greater honor than he deserves, nor of every sort of honor. He is the great-souled person. So it is clear that greatness of soul is a mean state between conceitedness and smallness of soul.

1.26
Magnificence

1. Magnificence is a mean state between pretentiousness and niggardliness. Magnificence is concerned with [large] expenditures where appropriateness is fitting. **1192b1** Whoever, then, expends them where one should not is pretentious—for example, if someone provides a feast for his dining club as if he is providing a feast for a wedding, such a person is pretentious. For the pretentious person is the sort of person who shows off his prosperity on occasions when one should not. **2.** The niggardly person is the contrary of this. He will not make a large expenditure when one should or not spend at all, for example, on wedding feasts or on a chorus for a play, or not do so in a worthy way but in a deficient one. The person of this sort is niggardly.

3. Magnificence from its very name is manifestly of the sort that we say; for since it spends large amounts (*mega*) on the appropriate (*prepon*) occasion, it is correctly given the name "magnificence" (*megaloprepeia*). Therefore, magnificence, since it is praiseworthy, would be a certain mean state between deficiency and excess, concerning appropriate [large] expenditure on the requisite occasions.

4. But there are, as people think, several sorts of magnificence—for example, they say "he went around in a magnificent way," and other such things of course are said to be "magnificent" metaphorically, not in a strict sense. For it is not these that magnificence is found in, but in the things we mentioned.

1.27
Indignation

1. Indignation is a mean state between envy and spite; for both of these are blameworthy, but the indignant person is praiseworthy. Indignation is a sort of pain concerning good things, ones that belong to a person unworthy of them. An indignant

person, then, is the one who feels pain at such things, and this same person again will feel pain if he sees someone doing badly who does not deserve it. **2.** Indignation, then, and the indignant person are presumably of this sort. But the envious one is the contrary of this. For he simply feels pain if someone is doing well, whether it is deserved or not. In a similar way to him the spiteful person will be pleased when someone is doing badly, whether it is deserved or not deserved. The indignant person is not of this sort,[71] but rather a mean between them.

1.28
Dignity

1. Dignity is a mean between being surly and being ingratiating, and is concerned with social intercourse. For the surly person is the sort not to have social intercourse or conversation with anyone; his name seems to have been given to him from his mode [of character] (for the surly person (*auth-adês*) is someone who is self-satisfied (*auto-adês*), from being satisfied with himself). **2.** The ingratiating person, on the other hand, is the sort to have social interaction with anyone, in any circumstances, and anywhere. Neither of these, then, is praiseworthy, while the dignified person, since he is in a mean between them, is praiseworthy. For he has social interaction neither with everyone, but with those who are worthy, nor with no one, but with these same ones.

1.29
Shame

1. Shame is a mean state between shamelessness and bashfulness, and is concerned with actions and words. For the shameless person is the one who on any occasion, and in front of anyone, says and does random things, while the bashful person is the contrary of this, and is wary of doing or saying anything in front of[72] anyone (for the person of this sort—the one who is bashful about everything—is incapable of action). **2.** But shame and the shameful person are a mean between these.[73] For he will not say or do just anything in any circumstances, like the shameless person, nor, like the bashful one, be wary on every occasion and in all circumstances, but will do and say where one should, what one should, and when one should. **1193^{a}1**

71. Retaining τοιοῦτος.
72. Retaining πρὸς.
73. Omitting τις.

1.30
Wit

1. Wit is a mean state between buffoonery and boorishness, and is concerned with jibes. For the buffoon is the one who thinks one should jibe at everyone and everything, while the boor is the one who wishes[74] neither to jibe nor to be jibed at, but gets angry. **2.** But the witty person is a mean between these, who neither jibes at everyone and in all circumstances, nor is himself a boor. For the witty person will be said to be such in a sort of twofold way; for both the one who can jibe in a suitable way and the one who can take being jibed at are witty; wit too is like this.

1.31
Friendliness

1. Friendliness is a mean state between flattery and enmity, and is concerned with actions and words. For the flatterer is the one who adds more than is fitting and is really there,[75] while the one who is full of hatred is an enemy and subtracts even what is present. Neither, then, is correctly praised. **2.** But the friendly person is a mean between these. For he will not add more than what belongs, nor praise what is not fitting, nor, on the contrary, will he make less of things, or in all circumstances set himself in opposition, contrary to what seems so to him.

1.32
Truthfulness

1. Such, then, is the friendly person. Truthfulness is between self-deprecation and boastfulness. It is concerned with words, but not with all of them. For the boaster is the one who pretends to have more than he has, or to know what he does not know, while the self-deprecator is the contrary of this, and pretends to have less than he has, and does not say what he knows, but rather hides his knowledge. **2.** But the truthful person will do neither of these things. For he will pretend to have neither more than he has nor less, but what he has he will say he has and what he knows he will say he knows.

Whether these are virtues or not virtues, would be for another account; but that they are mean states between the things mentioned is clear. For those who live in accord with them are praised.

74. Omitting δεῖν.
75. Reading προσόντων.

1.33
Justice

1. It remains to speak about justice—what it is, what it is found in, and what sorts of things it is concerned with. First, then, if we wish to grasp what the just is, the **1193^{b}1**
just is twofold, of which one is the just in accord with the law. **2.** For people say that what the law prescribes is just. But the law orders the doing in action of courageous things, temperate things, and, in general, all the things that are said to be in accord with the virtues. That is also, they say, why justice seems to be a sort of complete 5
virtue. For if the things that the law orders us to do are just, and the law prescribes what is in accord with all the virtues, then the one who abides by what is just in accord with the law will be completely[76] excellent, so that the just person and justice are a sort of complete virtue.

3. One sort of justice, then, is found in these things and is concerned with these 10
things. But it is not the just in this sense, nor the justice concerned with these things, that we are seeking. For with respect to these just things it is possible to be just when by oneself; for the temperate, courageous, and self-controlled person[77] can be such when by himself. But the just in relation to another is a different thing than the just 15
in accord with the law that was mentioned. For in things that are just in relation to another it is not possible to be just by oneself. But it is the just in this sense that we are seeking, and the justice concerned with these things.

4. The just, then, that is in relation to another is, simply speaking, the equal. For the unjust is the unequal. For when people allocate more of the good things to 20
themselves and fewer of the bad ones, this is unequal. And in these cases, people think, one does injustice and suffers injustice. Therefore, it is clear that since injustice is found in unequal things, justice and the just must lie in equal transactions. **5.** So it is clear that justice is a sort of mean state between excess and deficiency, between too 25
much and too little. **6.** For the unjust person, by doing injustice, has more, and the one suffering injustice, by suffering injustice, has less. But the mean between these is just. And the mean is equal. So the equal between too much and too little would be just, and the one who wishes to have the equal would be just. **7.** But the equal arises 30
between at least two things. Therefore, being equal in relation to another is just, and the person of this sort would be just.

8. Since, then, justice is found in just, equal, and mean, and what is just is said to be just as between certain people, and the equal to be equality between certain ones,[78] and the mean to be a mean between certain ones, the result is that justice and the just 35
will also be in relation to certain people and between certain ones.

76. Reading τελέως.
77. Omitting ὁ^{2} and ὁ^{3}. See $1203^{b}12–23$.
78. Reading καὶ . . . ἔν τισι . . . τισιν.

9. Since, then, the just is equal, the proportionally equal would be just too. And the proportional is found in, at a minimum, four things: as A is to B, C is to D. For example, it is proportional that the one who has much contribute much, and that
1194a1 the one who has little contribute little; again, in the same way, that the one who has labored much receive much, and that the one who has labored little receive little. And as the one who has labored is to the one who has not labored, so much is to little; and as the one who has labored is to much, so the one who has not labored is to little.

10. Plato also seems to use this proportionality of justice in his *Republic*.[79] For the farmer, he says, produces food, the builder a house, the weaver a cloak, and the shoemaker a shoe. The farmer then gives the builder food, and the builder gives the farmer a house; and, in the same way, all the others are so related that they exchange their products for those of the others. **11.** And the proportion is this: as the farmer [gives] to the builder, so the builder gives to the farmer. Likewise, for the shoemaker, the weaver, and for all the others, the same proportion in relation to each other applies. And this proportion holds the constitution together. So the just seems to be the proportional. For the just holds constitutions together, and the just is the same as the proportional. **12.** But since the builder makes his own work worth more than the shoemaker does, and it was possible for the shoemaker to exchange his work with the builder, but not possible to get a house in return for a pair of shoes, it was in fact at that time that they introduced the convention (*enomisan*) of using something with which all these things can be bought, namely, silver, which they called "money" (*nomisma*), and of making their exchanges with each other by each giving for each work its worth [in silver]. And this[80] holds the constitution together.

13. Since, then, the just is found in these things and in what was mentioned before, the justice that is concerned with these would be a state[81] having an impulse, accompanied by deliberate choice, concerning these things and found in these.

Reciprocity is also just, but not in the way the Pythagoreans said. For they thought it just for a person to suffer in return the things that he did. But this sort of thing is not possible in relation to everyone. **14.** For justice for servant in relation to free person is not the same [in terms of suffering in return the things that one did]. For if the servant strikes the free person a blow, it is not just that he be struck a blow in return, but rather many blows. For the reciprocally just too lies in proportionality. For as the free person, by being better, is related to the slave, so what is done in return is related to what is done. It is the same way too for free in relation to free. For it is not just,[82] if someone has knocked out someone's eye, that he only have an eye knocked out in return, but that he suffer more, following along with what is proportional. For in fact he started things and committed an injustice, and so was doubly unjust. So

79. 369d–370a.
80. Reading τοῦτο.
81. Reading τις ἕξις.
82. Reading δίκαιον.

in proportion to the injustices in fact committed, his having more done to him than he did is just. **1194ᵇ1**

15. But since things are said to be just in many ways, we must determine what sort of justice our investigation concerns.

There is, then, a sort of justice, as they say, for servant in relation to master and son in relation to father. But the just in these cases would seem to have only a name in common with the politically just (for it—the politically just—is the just that our investigation is about). **16.** For it is found most of all in equality (for citizens[83] are partners of a certain sort, and tend to be equal by nature, though their modes [of life] are distinct), but in the case of son in relation to father, and servant in relation to master, there would not seem to be any element of the just. For neither is there any element of the just in the case of my foot or my hand in relation to me, nor likewise in the case of each of the other parts. Son[84] in relation to father would seem, then, to be the same way as well. For the son is like a sort of part of his father. Except that when he has already attained the position of a man and has been separated from him, then at that point he is in a relation of equality and similarity to his father; and citizens wish to be like this in certain ways. **17.** And in the same way, due to the same cause, there is also no element of the just in the case of slave in relation to master; for the slave is a sort of [part] of his master.[85] If there is an element of the just in relation to him, it is of the just suited to the household. But this, at any rate, is not what we are seeking, but rather the political sort. For the politically just would seem to lie in equality and likeness.

18. The just that is found in the community of wife and husband is close to the politically just. For while the wife is inferior to the husband, yet she is more of an intimate [than the others], and in a way shares more in equality. That is why their life is closer to one of political community. So too the just in the case of the wife in relation to the husband is in a way already more political than any of the others.

19. Since, then, the just is what is found in the political community, both[86] justice and the just person will be concerned with the politically just.

Among just things, some are by nature, others by law. But one must not suppose them to be so in such a way that they could never change to something else. For even the things that are by nature participate in change. **20.** I mean, for example, that if all of us always practiced throwing with the left hand, we would become ambidextrous. Yet by nature the left hand *is* the left hand, and things on the right are nonetheless by nature better than those on the left, even if we do everything with the left just as we do with the right. Nor because these things change to something else is it the case that, because of it, they are not so by nature. But if for the most part and the longer time the left remains in the present way left, and the right right, then this is so

83. Reading πολιτικοί.
84. Omitting ὁ.
85. *Pol.* 1254ᵃ11–13.
86. Reading καὶ.

by nature. **21.** It is the same way in the case of things that are just by nature: if they
1195a1 change because of our use, it is not the case that, because of this, there is nothing that is by nature just—there is. For what remains so for the most part is plainly just by nature. For what we set up and enact (*nomisômen*) is at that point just, and we call it "just" in accord with law (*nomos*). Just in accord with nature is better, then, than just in accord with law. But what we are seeking is the just that is political. And the political one is so by law, not by nature.

22. The unjust and the unjust action might thus seem to be the same, but they are not. For the unjust is what has been determined by law (for example, it is unjust to take what has been entrusted to one's care), while the unjust action is the actual doing of something unjustly. Similarly, the just and the just action are not the same. For the just is what has been determined by law, while the just action is the doing of just things.

23. When, then, is there the just [realized], and when not? Simply speaking, when one does an action in accord with deliberate choice and voluntarily (what the voluntary is was stated by us above[87]), and when knowing whom one does it to, with what, and for the sake of what, one in this way does something just. Similarly too, and in the same way, the unjust person will be the one knowing whom, with what, and for the sake of what. But when, without knowing any of these things, one does something unjust, one is not unjust, but unlucky. For if someone has killed his father thinking that he is killing the enemy, though he has done something unjust, yet he is not being unjust at all,[88] but is unlucky.

24. Not being unjust, then, when one does unjust things lies in ignorance. That is,[89] as was also stated a little bit above, when the agent does not know whom he is harming, with what, or for the sake of what. But we must also define the ignorance, and say how the ignorance must arise if he is not going to be unjust to the person he harms. **25.** Let the following, then, be the definition: when the ignorance is the cause of his doing something, he does not do it voluntarily. So he is not doing something unjust. But when he is himself the cause of the ignorance, and acts[90] in accord with the ignorance of which he is himself the cause, he is then doing something unjust, and such a person will be rightly called "unjust." For example, in the case of people who are drunk. For those who are drunk and do something bad are doing something unjust; for they are themselves the cause of [their] ignorance. For it was possible for them not to have drunk[91] so much that they struck their father in ignorance. **26.** It is the same way in other cases of ignorance that arise because of the agents themselves; those who do injustice in accord with them are unjust. But where they are not themselves the causes, but their ignorance is the cause of their doing the actions they do,

87. 1.12–16.
88. Reading οὐθέν.
89. Reading ἔστιν οὖν . . . ἐστι τοῦτο.
90. Omitting τι.
91. Reading πιεῖν.

they are not unjust. This sort of ignorance is natural—for example, children strike their fathers in ignorance. But the ignorance that is in them, since it is natural, does **1195^{b}1** not make the children be called "unjust" because of their action. For the ignorance is the cause of their doing it, and they are not themselves causes of the ignorance, which is why they are not said to be unjust either.

27. How is it, then, as regards suffering injustice? Is it possible to suffer injustice voluntarily? Surely not! For while we do just and unjust things voluntarily, when we 5 suffer injustice it is no longer voluntary. For we avoid being punished, so it is clear that our suffering injustice would not be voluntary. For no one voluntarily endures being harmed; for to suffer injustice is to be harmed.

28. Yes, but there are some people who, when they should have what is equal, give way to others. So if, as we saw,[92] to have what is equal is just, and to have less is to 10 suffer injustice, and a person voluntarily has less, it follows, [the argument] says, that he suffers injustice voluntarily. But from the following, on the other hand, it is clear that it is not voluntary. For all who get less receive some compensation, either honor, praise, glory, friendship, or something else of this sort. But the one who receives some 15 compensation in return for what he gives up no longer suffers injustice. But if he does not suffer injustice, then he does not suffer it voluntarily either.

29. Again, further, those who get less and suffer injustice by not getting what is equal show off and pride themselves for such things, because they say: although it was open to me to take an equal share, I did not take it, but gave way to the elder, or 20 to a friend. But no one prides himself for suffering injustice. But if they do not pride themselves for suffering unjust actions and do pride themselves for these things, they would not suffer injustice at all in taking less in this way. But if they do not suffer injustice, they do not suffer injustice voluntarily either.

30. To these and these sorts of arguments, however, the argument from the case of the person who lacks self-control stands contrary. For the person who lacks 25 self-control harms himself by doing base things, and these, at least, he does voluntarily. Therefore, he harms himself knowingly. So he suffers injustice due to himself voluntarily. But a statement of the limits of possibility prevents this argument when added here. The statement of the limits of possibility is this: no one wishes to suffer 30 injustice. But the person who lacks self-control[93] wishes to do the things that are in accord with his lack of self-control, so that he does injustice to himself. Therefore, he wishes to do base things to himself. But no one wishes to suffer injustice. So even the person who lacks self-control would not be voluntarily doing injustice to himself.

31. But perhaps someone might here again be puzzled: Is it really possible for a 35 person to do injustice to himself? To someone investigating the matter from the perspective of the person who lacks self-control it would certainly seem to be possible. As, again, from the following way of looking at it. For if the things the law prescribes

92. 1.33.4–9.
93. Omitting γε.

doing are just, the person who does not do them does injustice. And if he does not do
1196a1 them to the person the law orders him to do them to, he does injustice to that person. But the law orders one to be temperate, acquire property, take care of one's body, and other things of this sort. Therefore, the person who does not do these things, does injustice to himself. For there is no one else to refer such unjust actions to.

32. But such things,[94] as we saw,[95] can hardly be true, nor is it possible for a person to do injustice to himself. For it is not possible for the same person at the same time to have more and less, nor to act voluntarily and involuntarily at the same time. But the person who does injustice, insofar as he does injustice, has more, and the person who suffers injustice, insofar as he suffers injustice, has less. Therefore, if he does injustice to himself, it is possible for the same person to have more and less at the same time. But this is impossible. Therefore, it is not possible for a person to do injustice to himself.

33. Further, the one who does injustice does injustice voluntarily, while the one who suffers injustice suffers injustice involuntarily. So if it is possible for a person to do injustice to himself, it would be possible to do something involuntarily and voluntarily at the same time. But this is impossible. Therefore, from this way of looking at it too, it is not possible for a person to do injustice to himself.

34. Further, suppose one were to take hold of the issue on the basis of particular unjust actions. For everyone does injustice either by taking what was entrusted to his care, committing adultery, stealing, or doing some other particular unjust action. But no one has ever taken what he entrusted to his own care, committed adultery with his own wife, or stolen his own property. So if doing injustice is found in these sorts of things, and it is not possible to do any of them to oneself, it will not be possible to do injustice to oneself.

35. But if it is possible, it will, at any rate, be an act not of political but of household injustice. For the soul, since it is divided into several parts, has within itself one that is inferior and one that is superior, so that if there is any unjust action of what is in the soul, it would be[96] of the parts against each other. For we distinguished[97] the act of household injustice by its being directed against the inferior or the superior, and in this way one can be unjust or just to oneself. But it is not this that we are investigating, but the political sort. **36.** So in the case of such acts of injustice as we are inquiring into, it is not possible for one to do injustice to oneself.

Again, which of the two does injustice, and in which is the unjust action found, when a person unjustly possesses anything whatsoever? Is it not found in the one who judges and makes the award, as in the games? For the one who receives the palm of victory from the person presiding and judging these matters does no injustice even if it was awarded to him unjustly. Instead, it is the one who has judged badly and

94. Reading τὰ τοιαῦτα.
95. 1.33.27.
96. Deleting ἐστι.
97. Reading γὰρ. See 1194b5–29.

given it who does injustice. And while he is in a way doing injustice, in a way he is not doing injustice. For insofar as he has not judged [in accord with] what is in truth **1196^{b}1** and by nature just, he is doing an injustice, while insofar as he has judged [in accord with] what seems just to him, he is not doing an injustice.

1.34
The Virtues of Thought

1. We have spoken about the virtues, saying what they are, in what they are found, and what sorts of things they are concerned with, and about each of them in particular, that if we act in accord with correct reason[98] the best thing [would come about]. But to speak in this way, saying "to act in accord with correct reason," is like saying that health would come about best if one administered healthy things. For such a statement is not perspicuous. And someone will say, "explain perspicuously to me what sorts of things are healthy." **2.** So too in the case of reason, what is reason and what correct reason?

Perhaps it is necessary first to divide what reason arises in. **3.** A distinction having to do with the soul was drawn in outline previously,[99] that there is one part of it that has reason, while the other is non-rational.[100] But the one part of the soul that has reason[101] admits of a twofold division, of which one is the deliberative part, the other the scientific part. And that these are distinct from each other may be made evident from their underlying subjects. **4.** For as color, flavor, sound, and odor are distinct from each other, so nature has in like manner assigned them distinct perceptual modalities as well. For we cognize sound by hearing, flavor by taste, color by sight. Similarly, we must suppose that the others are also the same way. But since[102] the underlying subjects are distinct, the parts of the soul by which we cognize them must be distinct too. **5.** For the intelligible and the perceptible are distinct; and these we cognize by soul. Therefore, the part concerned with perceptible objects and the part concerned with intelligible ones would be distinct. But the deliberative and deliberately choosing part is concerned with perceptible objects, those in movement, and, in general, with what comes to be and passes away. **6.** For we deliberate about things that are up to us to do or not to do in action and to deliberately choose them. And whatever there is[103] deliberation about and deliberate choice as to whether to do or not do them, are perceptible objects that are in movement and changing. So the deliberately choosing part of the soul is, in accord with this argument, concerned with perceptible objects.

98. Not in fact mentioned previously.
99. 1185^{b}1–12.
100. Omitting μόριον τῆς ψυχῆς.
101. Reading τὸ ἓν λόγον ἔχον μόριον.
102. Reading ἐπεὶ δ'.
103. Reading δ'ἐστιν.

7. Having drawn these distinctions, the next thing we must speak about—since reason is concerned with truth, and we are investigating in what way it possesses the truth—is scientific knowledge, practical wisdom, understanding, theoretical wisdom, and supposition, and what each of them is concerned with.

8. Scientific knowledge, then, is concerned with the scientifically knowable, and this is arrived at with the involvement of demonstration and reason, while practical wisdom is concerned with things doable in action, in which there is choice and avoidance, and it is up to us to do them or not to do them.

9. Of the things produced and of the things doable in action, the productive and the practical[104] are not the same. For of the ones that are productive there is some end beyond the process of production—for example, beyond building, since it is productive of a house, a house is its end beyond the process of production, and it is the same way in the case of carpentry and the other productive ones. **10.** But in the case of the practical ones, there is no other end beyond the action itself—for example, beyond playing the lyre there is no other end, but this itself is the end, that is, the activity and the action. Practical wisdom, then, is concerned with action and with things doable in action, while craft is concerned with production and things produced; for it is in things produced rather than in things doable in action that craft is employed.

11. So practical wisdom would be a sort of deliberately choosing and practical state concerned with all the things that it is up to us to do or not to do in action that in fact lead to what is advantageous.

12. Practical wisdom would seem to be a virtue, not a science. For the practically wise are praiseworthy, and praise is for virtue. Further, there is a virtue of every science, while of practical wisdom there is no virtue; on the contrary, it seems to be a sort of virtue itself.

13. Understanding is concerned with the starting-points of intelligible objects and of the beings; for scientific knowledge is of things that involve demonstration, but the starting-points are indemonstrable, so that scientific knowledge would not be concerned with the starting-points, but rather understanding would.

14. Theoretical wisdom is composed of scientific knowledge and understanding. For theoretical wisdom is concerned both with the starting-points and with what is then proved from the starting-points, which is what scientific knowledge is concerned with. Insofar, then, as it is concerned with the starting-points, it shares in understanding, but insofar as it deals with things involving demonstration that come after the starting-points, it[105] shares in scientific knowledge. So it is clear that theoretical wisdom is composed both of understanding and of scientific knowledge, so that it would be concerned with those things[106] that both understanding and scientific knowledge are concerned with.

104. I.e., a doer of action. See 1.34.28.
105. Reading αὕτη.
106. Reading ταῦτα.

15. Supposition is that by which we play a double game with everything, as to whether it is so or not so.

16. Are practical wisdom and theoretical wisdom the same thing? Surely not! For theoretical wisdom is concerned with things that involve demonstration[107] and are always the same way, while practical wisdom is concerned not with these, but with things that undergo change. I mean, for example, that straight, curved, concave, and things of this sort are always such, while advantageous things are no longer this way by[108] not changing into each other.[109] On the contrary, they do change, and a given thing is advantageous now, but tomorrow not, and to this person but not to that one, and is advantageous in this way but not advantageous in that one. Practical wisdom is concerned with advantageous things, but theoretical wisdom is not. Therefore, **1197^{b}1** theoretical wisdom and practical wisdom are distinct.

17. Is theoretical wisdom a virtue or not? From the following considerations,[110] based on practical wisdom itself, it will be clear that it is a virtue. For if practical wisdom is a virtue, as we say, of one of the two parts of the soul that have reason, and practical wisdom is inferior to theoretical wisdom (for it is concerned with inferior things; for theoretical wisdom is concerned with the eternal and divine, as we say, practical wisdom with what is advantageous to a human being)—if, then, the inferior is a virtue, it is fitting for what is superior, at any rate, to be a virtue; so it is clear that theoretical wisdom is a virtue.

18. What is comprehension and what is it concerned with? Comprehension is found where practical wisdom is also found, namely, concerning things doable in action. For the person of comprehension is, I suppose, said to be such due to his capacity to deliberate, and in that he judges and sees something correctly. But his judgment concerns unimportant things and in unimportant situations. Comprehension and being a person of comprehension, then, are part of practical wisdom and the practically wise person, and cannot be found without them; for one cannot separate the person of comprehension from the practically wise person.

19. What holds in the case of cleverness would seem to be similar. For cleverness and the clever person are not practical wisdom and the practically wise person, but the practically wise person is certainly clever, which is why indeed cleverness in a way works together with practical wisdom. **20.** But the base person is also said to be clever—for example, Mentor seemed to be clever, but he was not practically wise. For it is characteristic of a practically wise person and practical wisdom to seek the best things and to be always a deliberate-chooser and a doer in action of these, while it is characteristic of cleverness and the clever person to investigate what each of the things doable in action will come about from, and to provide these. The clever person, then, would seem to be found engaged in these sorts of things and concerned with these.

107. I.e., by leading to them.
108. Reading τῷ.
109. Reading ἄλληλα.
110. Reading διὰ τούτων.

21. But someone might raise a puzzle and wonder why in a study of characters and a sort of politics we are speaking about theoretical wisdom. Presumably, it is because, in the first place, the investigation of it would not even seem to be an alien one, if indeed, as we claim, theoretical wisdom is a virtue. Further, presumably it is characteristic of the philosopher, where these matters are concerned as well, to investigate also whatever happens to be found in the same thing. **22.** And it is necessary, when we are speaking about the things in the soul, to speak about[111] all of them. But theoretical wisdom is also in the soul. So we are not proceeding in an alien way in producing our accounts of it.[112]

23. As cleverness stands to practical wisdom so something would seem to stand in the case of all the virtues [of character]. I mean, for example, that there are virtues that arise also by nature in each individual, for example, in each one there are certain impulses, which are without reason, toward courageous things, just things, or the things that are in accord with a particular virtue; **24.** but there are also virtues due to habit and deliberate choice. The ones, then, that involve reason, since they are virtues in the complete sense, are praiseworthy when they supervene [on action]. But this natural virtue, which is without reason, when it is separated from reason is a small thing, and falls short of being praised, but when it is added to reason and deliberate choice it makes virtue complete. That is also why the natural impulse to virtue works together with reason and [in that way] does not exist without reason.

25. On the other hand,[113] reason and deliberate choice are also not fully complete in relation to being virtue, without natural impulse. That is why Socrates was not speaking correctly in saying that virtue is reason. For doing courageous things and just things is of no benefit, he thought, unless one knows and deliberately chooses them by reason. That is why he said, not correctly, that virtue is reason. But people nowadays do better. For they say that it is doing noble things in accord with correct reason that is virtue. **26.** But even this[114] is not correct. For someone might have done what is just correctly and in accord with correct reason (I mean having done it as correct reason would order) without any deliberate choice at all, or knowing what is noble, but from a non-rational impulse.[115] Nonetheless, this sort of action does not have what is praiseworthy. Instead, the way we define it is better, namely, that the impulse toward the good involves reason. For something of this sort is in fact virtue and is praiseworthy.

27. But someone might raise a puzzle as to whether or not practical wisdom is a virtue. Nonetheless, that it is a virtue may be made clear from the following consideration. For if indeed justice, and courage, and the other virtues, because they involve doing noble things, are[116] praiseworthy, it is clear that practical wisdom too would be

111. Reading ὑπὲρ.
112. Reading αὐτῆς.
113. Reading ὁ δ᾽αὖ.
114. Reading οὕτως.
115. Reading ὁρμῇ.
116. Omitting καὶ.

among the things that are praiseworthy and rank as virtues. For what courage impels us to do, practical wisdom impels us to do as well. For, in general, as it prescribes, this way courage also acts, so that if it is praiseworthy for doing what practical wisdom prescribes, practical wisdom would be a completely praiseworthy virtue.[117]

28. But whether practical wisdom is [genuinely] practical[118] or not one may see from the following, by looking at the sciences—for example, at building. For in building, as we say, there is the one called the "architectonic craftsman," and another, who assists him, the builder; and he is productive of a house. But the architectonic craftsman, to the extent that he has produced a house, is also productive of a house. It is the same way in the case of all the productive sciences in which there is an architectonic craftsman and his assistant. Therefore, the architectonic craftsman will be productive of the very same thing as his assistant.[119] **29.** If, then, it is similar in **1198^{b}1** the case of the virtues as well, as is precisely fitting and reasonable, practical wisdom would also be practical. For all the virtues are practical, and practical wisdom is a sort of architectonic craftsman of them. For as it prescribes, so the virtues, and the people who [live] in accord with them, do in action. Since, then, the virtues are practical, practical wisdom would also be practical.

30. But does it rule over everything in the soul, as it seems to and is puzzling? Surely not! For it would not seem to do so over what is superior to itself—for example, it does not rule over theoretical wisdom. But, [the puzzled one] says, it supervises everything, and is in control of issuing prescriptions.

31. But presumably it has the same position as the steward in the household. For he is in control of everything and manages everything, yet he does not at all rule over everything, but rather provides leisure for the master, in order that he may not be hindered by the necessities [of life] and prevented from doing something that is noble and fitting. **32.** So too, and in a similar way to this, practical wisdom is, as it were, a sort of steward of theoretical wisdom, and provides leisure for it and for the doing of its work, by restraining the feelings and making them temperate.

BOOK 2

2.1
Decency

1. After this we should make an investigation of decency—what it is, what it is found in, and what sorts of things it is concerned with. Decency and the decent person tend to mitigate the things that are just in accord with law. For where the legislator

117. Omitting καὶ$_1$ and καὶ$_2$.
118. 1.34.8.
119. Reading ὑπηρέτης.

is incapable of determining the particulars exactly, but speaks in universal terms, the person who in these cases gives way, and chooses those things that the legislator would have wished[120] by determining the particulars, but was unable to, such a person is decent. But he does not tend to mitigate the things that are unconditionally just. For he does not tend to mitigate the things that are by nature truly just, but of things that are just in accord with law, ones that the legislator, from inability, left out.

2.2
Consideration

1. Consideration and the considerate person are concerned with the same things as decency (that is, the just things left aside by the legislator by not being defined exactly). He is able to judge the things left out by the legislator, knowing that they have been left out by the legislator, even though they are just. Such a person is considerate. Consideration, then, does not exist without decency; for it is characteristic of the considerate person to judge, but then[121] of the decent one to act and[122] act in accord with the judgment.

2.3
Good Deliberation; Puzzles about Justice and Practical Wisdom

1. Good deliberation is concerned with the same things as practical wisdom (for it is concerned with things doable in action that concern choice and avoidance), and does not exist without practical wisdom. For practical wisdom involves doing these things in action, while good deliberation is a state, disposition, or something of this sort, that is capable of attaining the best and most advantageous in what is doable in action. **2.** That is why the things that are the objects of good deliberation would not seem to be the sort of things that turn out appropriately by luck. For where there is no reason that is looking for the best, you would no longer say that a person for whom something turned out appropriately had deliberated well, but that he has good luck. For accomplishments that occur without the judgment of reason are cases of good luck.

3. In social intercourse, is it characteristic of the just person to give to each person equally (I mean, for example, of whatever sort the particular person is, this is the sort he becomes on meeting him)? Surely not! For this would seem to be characteristic of a flatterer and an ingratiator. But to assign what is in accord with his worth to each, this would seem to be characteristic of the unconditionally just and excellent person.

120. Omitting τῷ.
121. Reading τὸ δ᾽ἥδη.
122. Retaining καὶ.

4. But someone might also raise this puzzle: if indeed doing injustice is harming voluntarily, knowing whom, how, and for the sake of what, and if harm and injustice are found in and concern good things, then the doer of injustice and the unjust person would know what sort of things are good and what sorts are bad. But to know about these things is special to the practically wise person and to practical wisdom. The absurdity then results that with the unjust person there follows along the greatest good, practical wisdom.

5. Or would practical wisdom not seem to follow along with the unjust person? For the unjust person does not investigate, nor is he capable of judging, what is unconditionally good and what is good for him, but makes errors. **6.** But it is characteristic of practical wisdom to be capable of getting a correct theoretical grasp on these things. It is just like the case of matters of medicine where we may all know what is unconditionally healthy and productive of health—that hellebore, a laxative, surgery, and cautery are healthy and productive of health—but nonetheless we do not possess the science of medicine. For we do not know yet what is good in a particular case, in the way the doctor knows for whom a given thing is good and when and being in what condition; for it is in fact in this that the science of medicine is found. We know what is unconditionally healthy; nonetheless we do not possess the science of medicine, nor is it something that follows along with us.

7. The unjust person is the same way. He knows that[123] ruling office and authority **1199b1** are unconditionally good; but whether they are good for him or not, or when, or to him being in what condition, he does not know yet. But this above all is characteristic of practical wisdom. So practical wisdom does not follow along with the unjust person. For the good thing he chooses, and which he does injustice for, are what are unconditionally good, yet not, presumably, good for him. For wealth and ruling office are unconditionally good but, nevertheless, presumably not good for him. For equipped with prosperity and ruling he will do much evil to himself and his friends. For he will not be capable of using ruling office correctly.

8. But this too contains a puzzle and an investigation as to whether injustice toward a base person is possible or not. For if injustice consists in harm, and harm in the deprivation of goods, injustice would seem not to harm [the base person]. For the goods he thinks to be good for him are not good. For ruling office and wealth will harm the base person, who is not capable of using them correctly. If, then, they will harm him by their presence, the one who deprives him of them would not seem to be doing an injustice. **9.** This sort of argument would indeed seem unacceptable to ordinary people. For all think that they are capable of using ruling office, power, and wealth, but their supposition is incorrect. **10.** This is clear from the legislator as well. For the legislator does not entrust ruling office to everyone, but an age and property are determined that must be possessed by anyone who is going to rule, on the supposition that ruling is not possible for everyone. If, then, someone were to be

123. Omitting καὶ ἡ τυραννὶς ("tyranny").

annoyed that he was not ruling, or that no one allowed him to govern, one might reply, "Because you have nothing in your soul of the sort that would make you capable of ruling and governing." **11.** In the case of the body, we see that people cannot be healthy by administering things that are unconditionally good to themselves. Instead, if someone is going to make his bad body healthy, he must first administer water to it and a small quantity of food. And when someone has a bad soul, in order that he may not do any evil, he must[124] refrain from wealth, ruling office, power, and such things generally, doing so more to the extent that a soul is more easily moved and more easily changed than a body. For just as being moderate was suitable for the person who is base regarding the body,[125] so living without having any things of this sort is suitable for the person with a bad soul.

12. There is also another sort of puzzle: When it is not possible to do what is courageous and what is just at the same time, which should one do? In the case of the natural virtues, we said that the impulse alone toward the noble without reason **1200a1** needs[126] to be present. But when there is choice, it is present in reason and in the part that has reason. So at the same time as choice is present, complete virtue will also be present, which we said[127] involves practical wisdom, though not without the natural impulse toward the noble. **13.** Nor will virtue be contrary to virtue. For it naturally yields to reason, and the way it prescribes, so that the things reason leads to, to these it inclines. For reason is the chooser of what is better. For the other virtues do not come about without practical wisdom, nor is practical wisdom complete without the other virtues, but they work together with each other in a way by following along with practical wisdom.

14. But things of this sort will also raise no less a puzzle, whether it is ever the case with virtues as it is the case with other goods, both external and concerned with the body. For when these run to excess they make people worse—for example, when wealth becomes great it makes people haughty and unpleasant. It is the same way in the case of the other goods—ruling office, honor, beauty, stature. **15.** Is it this way, then, in the case of virtue too, so that if someone has justice or courage to excess he will be worse? "Surely not," he says. But from[128] virtue comes honor, and when honor becomes great, it makes people worse. "So it is clear," he says, "that virtue, by advancing to a growth in magnitude, makes people worse; but[129] of honor virtue is the cause, so that virtue also, if it becomes great, will make people worse." **16.** But surely this is not true. For if there are also many other works that virtue has, as in fact there are, among the most important of them is being capable of using these and these sorts of goods correctly, when they come. If, then, the excellent person, when

124. Omitting οὐκ and turning the question into a statement.
125. Reading τῷ σώματι.
126. Retaining δεῖν.
127. 1197b36–1198a21.
128. Omitting τῆς.
129. Reading δὲ.

great honor or high ruling office comes to him, will not use them correctly, he would no longer be excellent. Neither honor, then, nor ruling office will make the excellent person worse, so neither will virtue.

17. In general, since it was determined by us at the start[130] that virtues are mean states, it follows that the more a state is a virtue, the more it is a mean. So it is not the case that as a virtue goes toward greatness it will make someone worse; on the contrary, it will make him better. For the mean state, we saw, is a mean state between deficiency and excess in feelings.

2.4
Self-Control and Lack of Self-Control

1. So much, then, for these matters. After this it is necessary for us to make another start and speak about self-control and lack of self-control. **2.** But just as, to the extent that they are virtue and vice,[131] these are strange, in like manner it is necessary for the accounts we give of them to be strange too. For this virtue is not like the others. For in the others reason and feelings have an impulse toward the same things and **$1200^{b}1$** are not contrary to each other, while in this virtue reason and feelings are contrary to each other.

3. There are three things in the soul in virtue of which we are said to be base: vice, lack of self-control, and beastliness. About vice and virtue, then, what they are and in what they are found, we have spoken above. But now we must speak about lack of self-control and beastliness.

2.5
Beastliness

1. Beastliness is a sort of excessive vice. For when we see someone who is entirely base, we say that he is not even a human being, but a beast, implying that beastliness is a sort of vice. **2.** The virtue that is opposed to it is nameless, but it is of a sort that is beyond human, like a sort of heroic or divine virtue. But this virtue is nameless because there is no virtue[132] that belongs to a god. For the god is something superior[133] to virtue and it is not in accord with virtue that he is excellent. For, if there were, virtue would be superior to the god. **3.** That is why the virtue opposed to the vice of beastliness is nameless. But what is customarily opposed to this sort of vice is divine

130. $1185^{b}13–32$, $1186^{a}9–35$.
131. Reading ὥσπερ δὲ, ᾗ ἀρετὴ καὶ κακία, αὗταί εἰσιν ἄτοποι.
132. I.e., of character. See *NE* $1178^{b}7–23$.
133. Reading βέλτιον.

and beyond-human virtue; for just as the vice of beastliness is beyond human, so is the opposing virtue.

2.6
Puzzles Concerning Self-Control and Lack of Self-Control

1. With regard to lack of self-control and self-control, we should first state the puzzles and the arguments that are contrary to what appears to be the case, in order that, having considered them together on the basis of the puzzles and the contrary arguments, and having examined these, we may as far as possible see the truth about them. For, in this way, it will be easier to see what is true.

2. Socrates the elder used to do away with lack of self-control altogether and claim that it did not exist,[134] saying that no one would choose bad things knowing that they are bad. But the person who lacks self-control seems, while knowing things to be base, to choose them nonetheless, being led by feelings. Due, then, to this sort of argument Socrates did not think that there is lack of self-control; but not correctly.

3. For it is absurd, convinced by this argument, to do away with what we are persuaded occurs; for there are human beings who lack self-control, and these, knowing that the things are base, nonetheless do them.

4. Since lack of self-control exists, then, does the person who lacks self-control have some sort of scientific knowledge by which he gets a theoretical grasp on and examines the base things? But, again, this would seem not to be the case. Again, however, it would be absurd for[135] the strongest and most secure thing in us to be defeated by anything. For scientific knowledge is the most stable and forceful thing in us. So this argument, again, is contrary to its being[136] by scientific knowledge [that he gets a theoretical grasp on the base things].

5. But though not scientific knowledge, is it belief, at least? But if the person who lacks self-control has belief, he would not be blameworthy. For if he does something base having not exact knowledge but belief, one would give sympathetic consideration to his having sided with pleasure and done base things, since he did not have exact knowledge that they were base, but belief. And those for whom we have sympathetic consideration, we do not blame. So the person who lacks self-control, if indeed he has belief, will not be blameworthy. But he is blameworthy.

6. Arguments of this sort, then, produce puzzlement. For some said that it is not scientific knowledge, for an absurdity results; others again said that it is not belief either, for they too produced an absurd result.[137]

134. *Protagoras* 352a–359a.
135. Reading ἀλλὰ πάλιν ἄν δόξειεν ἄτοπον.
136. Deleting μὴ.
137. Reading συμβαίνειν . . . ἐποίουν συμβαίνειν.

7. Someone might also raise the following puzzle: Since the temperate person seems also to be self-controlled, is there anything that will produce excessive appetites in the temperate one? If he is to be self-controlled, he must have excessive appetites; for one would not say that a person who is in control of moderate appetites is self-controlled. But if he is not[138] to have excessive appetites, he will no longer be temperate; for the temperate person is not[139] the one who does not have an appetite or feel anything at all.

8. The following sorts of things also again involve puzzles: it follows from the arguments that even the person who lacks self-control is sometimes praiseworthy and the self-controlled one blameworthy. For let it be the case, [the argument] says, that someone has made an error in his rational calculation, and let him, due to his rational calculation, believe that the noble things are base, but let his appetite lead him toward the noble ones. His reason, then, will not permit him to do them, but, since he is led by his appetite, he will do[140] them. {For the person who lacks self-control, as we saw, is of this sort. Therefore, he will do the noble ones; for let appetite lead him toward these. But reason will be preventing him; for let him make an error in his rational calculation about the noble ones.}[141] This person, then, though lacking self-control, will however be praiseworthy; for insofar as he does noble things, he is praiseworthy. But this result is absurd.

9. Again, on the other side, let him make an error in reason, and let the noble things seem to him not to be noble, but let his appetite lead him toward the noble ones. But a self-controlled person is the one who, though having an appetite to do something, does not do it, because of reason. The one who makes an error in reason about the noble things, then, will prevent [himself] from doing what he has an appetite for. Therefore, he will prevent [himself] from doing the noble things (for it was toward these that his appetite was leading him). But the person who does not do the noble things that he should do is blameworthy. Therefore, the self-controlled person will sometimes be blameworthy. But this result is also absurd.

10. And someone might also raise a puzzle as to whether lack of self-control and the person who lacks self-control are found in everything and concerning everything, for example, wealth, honor, anger, and reputation (for concerning all these there seem to be people who lack self-control), or not so, but rather lack of self-control is concerned with something definite.

11. These, then, are the things that present a puzzle; but it is necessary to resolve **1201^{b}1**
the puzzles. First, then, the case of scientific knowledge; for it seemed absurd for someone who has scientific knowledge to throw it away or fall away from it.
12. The same argument applies to belief as well; for it makes no difference whether it is belief or scientific knowledge. For if the belief will be very stable and immovable

138. Retaining μὴ.
139. Reading οὐ.
140. Reading πράξει.
141. Perhaps to be omitted as a marginal gloss.

by persuasion, it will be no different from scientific knowledge, in those who have beliefs, in[142] persuading them that things are as they believe—for example, Heraclitus of Ephesus has this sort of belief about what he believed.[143]

13. But there is nothing absurd in the person who lacks self-control doing something base, whether he has scientific knowledge or belief of the sort we are talking about. For knowing scientifically is twofold: one is possessing scientific knowledge (for we say that someone knows scientifically when he possesses scientific knowledge), while the other is actively using the scientific knowledge already possessed. The person, then, who possesses scientific knowledge of the noble things, but does not actively use it, lacks self-control. **14.** When he does not actively use this scientific knowledge, then, there is nothing absurd in his doing the base things while possessing the scientific knowledge. For it is like the case of people asleep. For they, though they possess scientific knowledge, nonetheless do and suffer many odious things in their sleep. For the scientific knowledge is not activated in them. It is likewise in the case of the person who lacks self-control. For he seems like one asleep, and does not actively use his scientific knowledge. **15.** In this way, then, the[144] puzzle is resolved. For the puzzle was whether the person who lacks self-control at the relevant time throws away his scientific knowledge or falls away from it. For both seemed to be absurd.[145]

But, again, it might be made evident in the following way; for as[146] we said in the *Analytics*[147] a syllogism is composed of two premises, and of these, the first is universal, while the second falls under it and is particular—for example,

> I scientifically know how to make anyone with a fever healthy,
> This person has a fever,
> Therefore, I scientifically know how to make this person healthy too.

It is possible, then, on the one hand, to scientifically know something with the universal scientific knowledge and, on the other, with the particular.[148] **16.** Error, then, can strike the person who possesses scientific knowledge here as well—for example, I scientifically know how to make anyone with a fever healthy, yet whether this person has a fever, I do not know. Similarly, in the case of the person who lacks self-control, then, the same error will occur. For it is possible for the person who lacks self-control to have the universal scientific knowledge that these sorts of things are base and harmful, yet not know that these things are base,[149] so that while possessing

142. Reading δόξας ἔχουσι τῷ.
143. *NE* 1146ᵇ29–31.
144. Reading ἡ.
145. Reading ἄτοπα.
146. Reading ὡς γὰρ.
147. Probably no reference to Aristotle's *Analytics* is indicated.
148. Omitting οὔ.
149. Omitting ἐπὶ μέρους.

scientific knowledge in this way he will make an error. For he has the universal scientific knowledge, but not the particular.

17. In this way too, then, nothing absurd will result in the case of the person who lacks self-control if, while possessing scientific knowledge, he does something base. For it is like the case of people who are drunk. For drunk people, when their drunken- **1202^{a}1**
ness has left them, are themselves again. Reason was not expelled from them, nor was scientific knowledge, but it was mastered by their drunkenness.[150] The person who lacks self-control is again in a similar situation.[151] For his feeling, having mastered it, 5
put his rational calculation to rest. But when the feeling, like the drunkenness, has left, he is himself again.

18. There was another argument[152] about lack of self-control that presented a puzzle, implying that the person who lacks self-control will sometimes be praiseworthy, and the self-controlled person blameworthy. But this is not the case. For the person who is deceived in his reason is neither self-controlled nor lacks self-control, but 10
rather the one who possesses correct reason judges the base and noble things by it, disobeys this reason, and lacks self-control, while the one who obeys it and is not led by his appetites is self-controlled. For if it seems to someone that it is not shameful to beat his father, and having an appetite to beat him, refrains from it, he is not 15
self-controlled. **19.** So, if in cases of this sort there is neither self-control nor lack of self-control, neither would the lack of self-control be praiseworthy, as it seemed, nor the self-control be blameworthy.

20. Among the various sorts of lack of self-control, some are morbid, others by nature. For example, the following sorts are morbid. For there are[153] people who 20
pluck out their hairs and chew on them.[154] If, then, someone masters this pleasure, he is not praiseworthy,[155] nor blameworthy if he fails to, or not *very*. Those by nature are, for example: they say that a son was once being tried in court for beating his father, and defended himself by saying, "Yes, indeed, and he beat his father," and was, of course, acquitted. For it seemed to the judges that his fault was natural. If, then, 25
someone [in a case like this] were to master [the impulse] to beat his father, he is not praiseworthy. **21.** It is not, then, these sorts of lack of self-control and self-control that we are seeking now, but those for which we are said to be unconditionally blameworthy or praiseworthy.

Of goods, some are external—for example, wealth, ruling office, honor, friends, 30
reputation; others necessary and concerned with the body—for example, touch and taste. He, then, who lacks self-control concerning these would seem to lack

150. Omitting ἀπαλλαγέντες . . . εἰσίν ("but when their drunkenness has left they are themselves again").
151. Omitting οὖν and retaining πάλιν.
152. 1201^{a}16–35.
153. Omitting τινες.
154. Cf. *NE* 1148^{b}28–29.
155. Reading οὐκ . . . ἐπαινετός.

self-control unconditionally.[156] And the lack of self-control that we are seeking would seem in fact to be concerned with these.

22. For[157] the puzzle was[158] what exactly lack of self-control is concerned with. Concerning honor, then, a person would not seem to lack self-control unconditionally. For the person who lacks self-control concerning honor is praised in a way. For he is a sort of lover of honor. And, in general, when we say that someone lacks self-control in the case of such things, we do it with an addition—lacks self-control concerning honor, reputation, or anger. But to the one who unconditionally lacks self-control we do not add what it is concerning, on the supposition that in his case it is evident, without the addition, what it concerns. For it is with bodily pleasures and pains that the person who unconditionally lacks self-control is concerned.

23. It is clear from the following that lack of self-control is concerned with these things; for since the person who lacks self-control is blameworthy, his subject matters must be blameworthy too. But honor, reputation, ruling office, wealth, and the other things people are said to lack self-control concerning are not blameworthy, but the bodily pleasures are blameworthy. That is why the person[159] who is concerned with these more than one should be is quite reasonably said to lack self-control in the complete sense.

24. Since, among the so-called lacks of self-control concerned with other things, the one concerned with anger is very blameworthy, is it the one concerned with anger that is more blameworthy or the one concerned with pleasures? The lack of self-control concerned with anger is like those[160] who are eager to be of service. For they too, when the master says "give me," get carried away by their eagerness, and, before they hear what they should give, give something, and make an error in what they give; for often when they should give a book, they gave a pen. **25.** The person who lacks self-control concerning anger undergoes something[161] like this. For spirit, as soon as it hears it said that a person did injustice, is impelled to take revenge, no longer waiting to hear whether it should or should not do so, or not in so extreme a way.

26. This sort of impulse to anger, then, because of which[162] lack of self-control concerning anger appears to exist, is not very blameworthy, while the impulse toward pleasure is of course blameworthy. For it is different from the former in that reason turns it away from doing the action, but it nonetheless does it, contrary to reason. That is why it is more blameworthy than lack of self-control due to anger. For lack of self-control due to anger is [accompanied by] pain (for no one feels anger without being pained), while that due to appetite involves pleasure. That is why it is

156. Omitting καὶ ἡδοναὶ σωματικαί.
157. Reading γὰρ.
158. 1201a35–39.
159. Reading ὤν.
160. Omitting τῶν παίδων.
161. Reading τι ἔπαθε.
162. Reading ᾗ.

more blameworthy. For lack of self-control due to appetite seems to involve wanton aggression.

27. Are self-control and resilience the same thing? Surely not! For self-control is concerned with pleasures and the self-controlled person is the one who masters pleasures, while resilience is concerned with pains. For the resilient person is one who endures and withstands pains.

28. Again, lack of self-control and softness are not the same. For softness and the soft person cannot withstand pains—not all of them, but those that someone else would necessarily withstand, while the person who lacks self-control is incapable of withstanding pleasures, but is made soft and led by them.

29. Again, there is, on the other hand, a sort of person who is called "intemperate." Is the intemperate person, then, the same as the person who lacks self-control? Surely not! For the intemperate person is the sort of person who thinks that what he does is best and most advantageous for himself, and has[163] no reason going contrary to what appears pleasant to him. But the person who lacks self-control has a reason that opposes him [in his doing the things] that his appetite leads toward. **1203^{a}1**

30. Which is harder to cure,[164] the person who lacks self-control or the intemperate person? It would seem, then, to be the person who lacks self-control;[165] for the intemperate person is easier to cure; for if a reason were to appear in him teaching him that the things are base, he would no longer do them. In the person who lacks self-control, however, the reason is already present, and he does them nonetheless. So a person of this sort would seem to be incurable.

31. But which has the worse disposition, the one in whom no good at all is present, or the one in whom some good is present together with these bad [actions]? Surely, it is clear that it is the intemperate person, the more so to the extent that the more estimable thing is badly disposed. Therefore, the person who lacks self-control has his reason in good condition, since it is correct, while the intemperate person does not.

32. Further, the reason of each person is a starting-point. In the person who lacks self-control, then, the starting-point, which is the most estimable thing, is well disposed, while in the intemperate one it is badly disposed. So the intemperate person would be worse off than the one who lacks self-control.

33. Further, as[166] in the case of the vice of beastliness of which we spoke,[167] it is not in a beast that one sees it, but rather in a human being (for "beastliness" is a name for excessive vice). Why? Because of nothing other than the fact that there is no base starting-point in a beast. The starting-point is reason. Further,[168] which

163. Reading ἔχει.
164. Reading ἀνιατότερος.
165. Omitting ἴσως οὐχ.
166. Omitting καὶ.
167. 2.5.
168. Reading ἔτι.

could do more evil, a lion or Dionysius, Phalaris, Clearchus, Eumathes,[169] or some other depraved people of this sort?[170] Surely, it is clear that it is these people. For the presence of a base starting-point within contributes great [evils], but in the beast there is no starting-point at all. **34.** In the intemperate person, then, there is a base starting-point. For insofar as he does base things and reason assents to these, and it seems to him that he should do them, the starting-point present in him is [base, while in the person who lacks self-control the starting-point that] is present is healthy.[171] That is why the person who lacks self-control would seem to be better than the intemperate person.

35. There are two forms of lack of self-control. One is a sort of impetuosity and lack of forethought and comes about suddenly (for example, when we see a beautiful woman, we immediately feel something, and, due to the feeling, an impulse is produced toward doing something that perhaps we should not do), while the other is like a sort of weakness, but involving[172] reason that turns us away. The former would not seem to be very blameworthy; for this sort appears even in excellent people, in those that are warm and of a naturally good disposition, while the other appears in
1203b1 cold and passionate ones, and people of this sort are blameworthy. **36.** Further, it is possible, by anticipating by means of reason, to feel nothing: "a beautiful woman is coming; hence, one should restrain oneself." Anticipating, then, by a reason of this sort, the person who lacks self-control because of the suddenness of the appearance will not feel anything and will not do anything shameful. But the one who knows by reason that he should not, but gives in to pleasure and is made soft, this sort of person is more blameworthy. For the one who lacks self-control in this way would never become excellent,[173] and anticipating reason would not cure him. For it is the leader present within [the one who knows], which he does not at all obey; instead, he gives in to pleasure and is made soft and somehow utterly weak.

37. Let us now speak about the puzzle of whether the temperate person is self-controlled, which was raised above.[174] Yes, the temperate person is also self-controlled. For the self-controlled person is not only the one who, when he has appetites within him, restrains them due to reason, but is also the sort of person who, even though he does not have appetites within him, is such as to retrain them, if any did appear. **38.** A person is temperate when he has no base appetites and when his reason concerning the relevant things is correct.[175] So self-control will follow along with temperance, and the temperate person will be self-controlled, but not the self-controlled one temperate. For the temperate person is the one who does not feel [these appetites],

169. Reading ἢ Εὐμάθης.
170. Reading τοιούτων.
171. Reading ἔνεστιν φαύλη, ἐν δὲ τῷ ἀκρατεῖ ἡ ἀρχὴ ἔνεστιν ὑγιής.
172. Omitting τοῦ.
173. Reading σπουδαῖος . . . ὁ ἀκρατής.
174. 1201a9–16.
175. Omitting ὁ δ' ἐγκρατὴς . . . ὀρθόν.

while the self-controlled person is the one who does feel them, or is such as at least[176] to feel them, but masters them. But neither of these is the case with the temperate person. That is why the self-controlled person is not temperate.

39. But is the intemperate person one who lacks self-control, or the person who lacks self-control intemperate? Or does neither follow along with the other? For the person who lacks self-control is one in whom reason fights against his feelings, but the intemperate one is not someone of this sort, but one who at the same time as he is doing base things has his reason voting with him. The intemperate person, then, is not like the one who lacks self-control, nor is the one who lacks self-control like the intemperate person. **40.** Further, the intemperate person is worse than the one who lacks self-control. For what is natural is harder to cure than what results[177] from habit (for habit too seems to be strong because of this, namely, that it turns into nature). **41.** The intemperate person, then, is in himself the sort of person who is such as to be base by nature. It is because of this too, and stemming from this, that reason in him is base. But the person who lacks self-control is not this way. For it is not because he in himself is the sort of person he is that his reason is[178] excellent (for if he is by nature the sort of person who is such as the base person is, it must be base). **42.** Therefore, the person who lacks self-control seems to be base by habit, the intemperate person by nature. The intemperate one, then, is harder to cure. For one habit is knocked out by another, but nature is knocked out by nothing.

43. But since indeed the self-controlled person is some[179] sort of person who is such as to know and not be deceived in his reason, and since the practically wise person is the sort who gets a theoretical grasp on each thing by correct reason, is it possible for the practically wise person to be someone lacking self-control, or not? For someone might raise a puzzle in these terms. But if we attend closely to what was said before, the practically wise person will not be someone lacking self-control. For we said[180] that the practically wise person was not only the one in whom correct reason is present, but also the one who does what in accord with correct reason appears best. But if the practically wise person does what is best, he would not be someone who lacks self-control; instead, it is the clever person that is of this sort. **44.** For we distinguished above[181] between the clever person and the practically wise one as being distinct. For while they are concerned with the same things, the one involves doing the things one should, while the other does not involve doing them. It is possible, then, for the clever person to be someone who lacks self-control (for cleverness does not involve doing the things one should), but it is not possible for the practically wise person to be someone who lacks self-control.

176. Reading οἷός γε.
177. Reading γινομένων.
178. Omitting οὐ.
179. Reading τις.
180. 1197^{b}22–24.
181. 1197^{b}17–27.

2.7
Pleasure

1. Next we must speak about pleasure, since it is with happiness that our account is concerned, and everyone thinks that happiness is pleasure and living pleasantly, or, at any rate, not without pleasure. For even those who scorn pleasure, and do not think that pleasure should be counted among the goods, do at least add absence of pain, and absence of pain is at all events close to pleasure.

2. That is why pleasure must be spoken about, not only because other people think we should, but because it is necessary for us to speak about pleasure. For since our account is about happiness, and we have given a definition of happiness[182] and declare it to be an activity of virtue in a complete life, and virtue is concerned with pleasure and pain, it would be necessary to speak about pleasure, since happiness is not without pleasure.

3. First, then, let us mention the things certain people say who do not think that one should take pleasure as being included in a class of good. First, they say that pleasure is a coming to be, that a coming to be is something incomplete, and that what is good never occupies the place of the incomplete. Second, that there are some base pleasures, but what is good is never included in badness. Again, that pleasure appears in all [animals] (for it appears in the base person and the excellent one, and in beasts wild and domesticated), but what is good does not mix with base things and is not
1204b1 common to many.[183] Also, that pleasure is not best of all, but what is good is best of all.[184] Also, that it is an impediment to doing noble things, but what is preventative of noble things would not be a good.

4. First, then, we must speak against the first one, which is related to coming to be, and try to refute the argument through its not being true. For, in the first place, not all pleasure is a coming to be. For the pleasure from contemplating is not a coming to be, nor is that from hearing[185] or smelling. For it does not result from a lack, as in the case of the others—for example, those from eating and drinking. For these result from lack and excess, from the replenishment of a lack or the removal of an excess. That is why they seem to be a coming to be. **5.** But lack and excess are pain. There is pain, then, where there is a coming to be of pleasure. But in the case of seeing, hearing, and smelling there is no antecedent pain; for no one who takes pleasure in seeing or hearing feels an antecedent pain. **6.** In the same way, in the case of thought, it is possible to feel pleasure in contemplating something without feeling antecedent pain. So there would be a sort of pleasure that is not a coming to be. If, then, as the

182. 1184b22–1185a13.
183. An argument may be omitted here. See 2.7.26.
184. 2.7.27.
185. Rejecting the addition of ἰδεῖν καὶ.

argument of these people claims, pleasure is not a good because it is a coming to be, but there is a sort of pleasure that is not a coming to be, this one would be a good.

7. But, in general, no pleasure is a coming to be; for even those pleasures that result from eating and drinking are not comings to be;[186] instead, those who say that these pleasures are comings to be are making an error. For since the pleasure results when the taking in [of food or drink] occurs, they think that because of this it is a coming to be. But it is not. **8.** For since there is a part of the soul by which we feel pleasure, at the same time as we take in what we lack, this part of the soul, insofar as[187] it is active, also moves, and the movement and activity of it is a pleasure. Because, then, of this part of the soul's being active at the same time as the taking in, or because of the activity of it, they think that the pleasure is a coming to be, due to the taking in being visible, the part of the soul invisible. **9.** It is like thinking that a human being is a body, because the latter is perceptible, while the soul is not. But the[188] soul, at any rate, also exists. It is the same way too in this case; for there is a part of the soul by which we feel pleasure, which is active at the same time as the taking in. That is why no pleasure at all is a coming to be. —**10.** Also, it is, they say,[189] the perceptible restoration to a natural state. [But it is not.] For pleasure is possible even for those who are not being restored to a natural state. For restoration is the result of the replenishment of a natural lack, but it is possible, as we say, to feel pleasure without any lack. For the lack is pain, but we say that one feels pleasure without pain, that is, before [there is] pain. —So if it is because pleasure is a coming to be that it seemed not to be a good, and no pleasure is a coming to be, pleasure would be a good.

11. But next, they say that not every pleasure is a good. One might be able to see about this one too in the following way. For, since we say that good is said of things in all the categories (for it is said of things in substance, relative, quantity, time, and, in general, in all of them), this much is evident at once. For in accord with every activity of a good thing a sort of pleasure follows along, so that, since the good is present in all the categories, pleasure too would be.[190] So, since the good and pleasure are present in these, and pleasure is pleasure from goods, every pleasure would be a good.

12. At the same time, it is clear from this that pleasures differ in form. For the categories differ in which pleasure is found. For it is not as it is in the sciences—for example, grammar or any other science whatsoever. For if Lampros possesses the science of grammar, he[191] will be disposed, due to this science of grammar, in the same way as anyone else who possesses the science of grammar. That is why[192] there

186. Omitting οὐκ.
187. Reading ᾗ.
188. Retaining ἡ.
189. Plato, *Philebus* 54c–55a.
190. Omitting ἀγαθόν.
191. Omitting ὁ γραμματικὸς.
192. Reading διὸ οὐκ.

are not two different sciences of grammar, the one in Lampros and the[193] one in Neleus.[194] But in the case of pleasure it is not like this. For the pleasure from drunkenness and the one from sexual intercourse do not dispose us in the same way. That is why pleasures would seem[195] to differ in form.

13. Because certain pleasures are in fact base, because of this too pleasure did not seem to these people to be a good. But this sort of point and this sort of judgment are not special to pleasure, but also apply to nature and scientific knowledge. For there is in fact a base nature too (for example, that of larvae, beetles, and, in general, animals that lack esteem), but nature is not a base thing because of this. **14.** Similarly, though there are base sciences (for example, the unrefined ones), nonetheless scientific knowledge is not a base thing because of this. On the contrary, both scientific knowledge and nature are good in kind. For just as one must get a theoretical grasp on what the quality of a sculptor is not from something he failed at and made badly, but from what he did well, in the same way one must not get a theoretical grasp on scientific knowledge, nature, or anything else from the base examples, but from the excellent ones.

1205b1 **15.** Similarly, pleasure too is a good in kind, since the fact that there are base pleasures is not something that escapes our notice either. For since there are also differences in the natures of the animals (for example, a base nature and an excellent one—that of a human being, for example, being excellent, that of a wolf or of some other wild beast being base, and, in the same way, there is one nature for a horse, another for a human being, ass, or dog), **16.** and since pleasure is a restoration[196] from what is contrary to nature to the state natural for each one, the result is that this would be special to it: to a base nature, at any rate, a base pleasure. For it is not the same thing to a horse and a human being, nor likewise to the others. But since indeed their natures differ, their pleasures differ too. For pleasure, we saw, is a restoration, and a restoration[197] restored to a natural state, so that of a base nature the restoration would be base, and of an excellent one excellent.

17. But those who say that pleasure is not an excellent thing are in a state of mind like those who, not knowing nectar, think that the gods drink wine, and that there is nothing more pleasant than it. But they are in this state of mind because of ignorance. The ones who say that all pleasures are comings to be and not a good are in a similar state of mind; for because they do not know that there are other pleasures besides the bodily ones, and see that these are comings to be and not an excellent thing, they think that, in general, pleasure is not a good.

18. Since, then, there is pleasure when a natural state is being restored and when it has been restored (for example, of the one when it is being restored, those that are

193. Reading ἡ.
194. Reading Νηλεῖ.
195. Reading δόξειεν.
196. I.e., in the view of those being criticized. See 2.7.10.
197. Omitting φασίν.

replenishments of a lack, of the other when it has been restored, those from seeing, hearing, and those of that sort), the activities of the natural state when it has been restored would be better. For the things that are said to be pleasures in both these ways are activities, so that it is clear that the pleasures from seeing, hearing, and thinking would be best, since the bodily ones, at any rate, are from a replenishment.

19. Further, this was also said, that pleasure is not a good, since what exists in all and is common to all is not a good. A thing of this sort, [they say,] more properly belongs to an honor-lover and a love of honor. For the honor-lover is the one who wishes to be sole possessor of [a good] and by such means to surpass the others. And so pleasure, if it is going to be a good, at any rate,[198] must be something of this sort. **20.** Surely this is not so. Rather, in fact, the contrary would seem to be a good because of this, because all things seek it. For all things naturally seek what is good, so that if all things seek pleasure, pleasure must be in kind a good.

21. Again too, on the grounds that pleasure is an impediment, it was stated that it **1206^{a}1** is not a good. But the claim that it is an impediment appears to be the case to them because they do not investigate in a correct way. For the pleasure from the thing being done is not an impediment. However, if it is alien, it is an impediment—for example, the pleasure from drunkenness is an impediment to doing things. **22.** But in this way one science will also be an impediment to another science. For it is not possible to be active in both at the same time. But why is a science not a good if it produces the pleasure that is from the science? And will it be an impediment? Surely not! Rather, one will be more a doer of actions. **23.** For pleasure impels one to be more a doer of actions when it is from the thing itself. For let the excellent person do what he does in accord with virtue, and do it with pleasure—will he not therefore be much more active with regard to the action? And if he does indeed do it with pleasure, he will be excellent, and if he is pained when he does what is noble, not excellent. For pain is felt at things due to compulsion, so that if someone is pained at doing noble actions, he is compelled to do them. But the one who does them from compulsion is not excellent.

24. But then it is not possible, of course, to act in accord with virtue without being pained or pleased. The in-between is not possible. Why? Because virtue lies in feeling, feeling lies in pain or pleasure, and to lie in between is not possible. It is clear, then, that virtue too involves pain or pleasure. Thus, if someone does the noble things with pain, he is not excellent. Thus, virtue could not involve pain. Therefore, it involves pleasure. **25.** Therefore, it is not only the case that pleasure is not an impediment, but it actually excites action, and, in general, it is not possible for virtue to be without the pleasure that comes about from it.

26. Another argument was that no science produces pleasure. But this is not true either. For gourmet cooks, garland makers, and parfumiers are productive of pleasure. (But for the other sciences, indeed, pleasure is not an end; rather, they involve

198. Reading γ᾽ ἀγαθὸν.

pleasure and are not without pleasure.)[199] There is, then, in fact a science that is productive of pleasure.

27. Yet another argument stated that pleasure is not best of all. But in this way and by this sort of argument you will do away with the so-called particular virtues too. For courage is not best of all. Is it not, then, a good because of this? Surely this is absurd! It is the same way too in the case of the others. Neither, then, is pleasure not a good, because it is not best of all.

28. To pass on, a puzzle of the following sort might be raised in the case of the virtues. I mean, since reason sometimes masters feelings (for we said this[200] in the case of the self-controlled person), and feelings again conversely master reason (for example, this happens in the case of those who lack self-control), and since the non-rational **1206b1** part of the soul that possesses vice masters reason, which is well-disposed (for the person who lacks self-control is of this sort), and reason likewise, when it is basely disposed, will master feelings that are well-disposed and possess their proper virtue—if [all] this will be so, the result will be that virtue is used badly (for when the person who is basely disposed due to his reason[201] uses virtue, he will use it badly). A result of this sort would seem absurd.

29. It is easy to reply to and resolve a puzzle of this sort on the basis of what was said by us before[202] about virtue. For we said that there is virtue at the time when reason, being well-disposed, is commensurable with feelings that possess their proper virtue, and the feelings with reason. For when they are disposed in this way they will be in harmony with each other, so that reason always prescribes what is best, while the well-disposed feelings readily do what reason may prescribe. **30.** If, then, reason is basely disposed, while the feelings are well-disposed, there will not be virtue, because of the failure of reason; for virtue is composed of both. So it is not possible to make a bad use of virtue either.

In general, it is not the case, as others think, that reason is the starting-point and leader of the virtues, but rather the feelings are. For there must first appear in us (as does in fact appear) a non-rational impulse toward the noble. Then, on the supposition that this is so, reason must later appear, putting the question to the vote and passing judgment. **31.** One may see this from children and those who live without reason. For in these, impulses of feeling, without reason, toward the noble appear first, while reason, appearing later and voting with them, produces the doing of noble things. But if they have taken their starting-point toward the noble things from reason, this is not the case: the feelings do not follow along in agreement, but rather they often go contrary to it. That is why feeling, when well-disposed, seems to be more of a starting-point for virtue than reason does.

199. Retaining the order in the mss.
200. 1201a29–30.
201. Reading λόγῳ.
202. 1202a8–18.

2.8
Good Luck

1. After this, the next thing to speak about would be good luck, since it is with happiness that our account is concerned. For ordinary people think that the happy life is the lucky one, or, at any rate, is not without good luck, and perhaps they are correct. For without the external goods, which luck controls, it is not possible to be happy. That is why we must speak about good luck, saying who, in general, the lucky person is, in what sort of things, and concerned with what.

2. First, then, someone coming upon and looking at the following things might raise a puzzle. For one would not say of luck that it is nature. For what nature is a cause of is for the most part or always[203] in the same way productive of, but luck never is, but is disorderly and random. That is why luck is said to be present in these sorts **1207^{a}1** of cases. Neither is it any sort of understanding, then, or correct reason; for there too, to no less an extent, there is what is ordered and always the same way, but not luck. That is why indeed where there is most understanding and reason, there is least luck, and where there is most luck, there is least understanding.

3. But is luck a sort of care from a god,[204] at least? Surely, it would not seem to be this! For we think that when the god has control of such things, he assigns good and bad things to those who deserve them, while luck and the things due to luck truly come about as random luck would have it. But if we assign this sort of thing to the god, we will make him a poor judge, or else not a just one; and this is not fitting for the[205] god.

4. But outside of these there is surely no other place we can assign to luck, so it is clear that it would be one of these. Understanding, reason, and scientific knowledge seem entirely alien to it. But then the care and goodwill of the god would not seem to be good luck either, because the latter appears even among base people. But the god is not likely to care for base people. **5.** Nature remains, then, and it is most akin to good luck.

Good luck and luck are found in things that are not up to us, things we are not in control of and are not capable of doing in action. That is why no one says that the just person, insofar as he is just, has good luck, or the courageous person, or, in general, anyone else who is in accord with virtue. For it is up to us to have or not to have these. But, in fact, it is in[206] the following sorts of things that we more properly speak of good luck. For we say that a well-bred person has good luck, and, in general, anyone to whom the sorts of goods belong that he himself is not in control of.

203. Reading ἀεὶ here.
204. Reading θεοῦ.
205. Retaining τῷ.
206. Reading ἐν.

6. Nonetheless, it is not even here that good luck in the strict sense would be referred to. For someone is said to have good luck in many ways. For we say that the person who happens to do in action something good contrary to his own rational calculation has good luck, and the sort who got a profit, when in accord with reason he should have got a loss, we say has good luck. **7.** Good luck, then, consists in having something good contrary to reasonable expectation, and in not getting something bad that is in accord with reasonable expectation. But good luck would seem to consist more in and to be more akin to getting what is good. For getting what is good would seem to be intrinsically a piece of good luck, while not getting what is bad would seem to be coincidentally a piece of good luck.

8. Good luck, then, is non-rational nature; for the person who has good luck is the one who has an impulse without reason toward good things and attains these. But this belongs to nature; for there is by nature present in the soul the sort of thing[207] due to which we are non-rationally impelled toward things we would be well suited for. **9.** And if one were to ask a person in this state, "Why does it please you to act in this way?" and he replies, "I do not know, but it does please me," he is affected like those who are possessed. For those who are possessed also have an impulse without reason toward doing something.

10. We do not have a proper and special name to call good luck by, but we often say that it is a "cause," though being a cause is alien to its name. For a cause is distinct from what it is a cause of, and we speak of it as a cause without there being any impulse toward attaining good things, as a cause[208] of our not getting what is bad, or, on the other hand, of getting something good when one is not thinking one will get something good. **11.** This sort of luck, then, is distinct from the previous sort, and it seems to come about from the vicissitudes of things, and to be coincidentally good luck. So, if this sort is also good luck, at any rate, the other sort is more akin to happiness, the one in which the starting-point of the impulse for the attaining of good things is in the agent himself.

12. Since, then, there is no happiness without external goods, and these come about due to good luck, in the way we just said, good luck would be a co-worker with happiness.

2.9
Noble-Goodness

1. So much, then, concerning good luck; but since we have spoken about each of the virtues one by one, it remains also[209] to state a universal synthesis summing up the particular cases.

207. Reading ἔνεστί τι φύσει.
208. Reading οἵαν.
209. Reading εἴη καὶ.

2. There is a name, then, that is not badly applied to the excellent person, "noble-goodness." For a person is noble and good, they say, when he is completely virtuous. For it is with respect to virtue that they say that someone is noble and good—for example, they say that the just person is noble and good, the courageous person, the temperate person, and, in general, with respect to all the virtues.

3. Since then we divide in two, and say that some things are noble and others, in turn,[210] good, and of the good ones, some are unconditionally good and others not, and since noble things are, for example, the virtues and actions due to the virtues, and good ones are, for example,[211] ruling office, wealth, reputation, honor, and things of this sort, the noble-and-good person is the one to whom the unconditionally good things are good and the unconditionally noble ones noble. For this sort of person is noble and good.

4. But the one for whom the unconditionally good things are not good is not noble and good, just as the person would not seem to be healthy either, for whom the unconditionally healthy things are not healthy. For if wealth and ruling office harm someone when they come, they would not be choiceworthy; rather, he will wish the sorts of things for himself that will not harm him. **5.** But the sort of person who is such as to shrink from something good in order for it not to be his would not seem **1208ª1** to be noble and good. But the one for whom all the good things are good, and is not destroyed by them, for example, by wealth or ruling office—he is the sort of person who is noble and good.

2.10
Correct Reason

1. We have spoken[212] about acting correctly in accord with the virtues, but not in an adequate way. For we said that it is acting in accord with correct reason. But presumably someone might be ignorant of this very thing, and might ask, "What exactly is the 'in accord with correct reason'?" and "Where is correct reason to be found?" **2.** Acting in accord with correct reason, then, is when the non-rational part of the soul does not prevent the rationally calculating part from activating its own activity. For then the action will be in accord with correct reason. For since we have one part of the soul that is inferior and another that is superior, and the inferior is always for the sake of the superior, as, in the case of body and soul, the body is for the sake of the soul, and we say that the body is in a good state at the time when its state is such that it does not prevent but rather contributes to and aids by impelling toward the soul's completing its work (for the inferior is for the sake of the superior, with a view to working together with it).

210. Retaining καὶ.
211. Retaining οἷον.
212. $1198^{a}10$–21.

3. When, then, the feelings do not prevent the understanding from completing[213] its own work, what is in accord with correct reason will come about. Yes, but presumably someone might respond, "What state must the feelings be in, so that they do not prevent it, and when are they in this state? For I do not know." **4.** Something of this sort is indeed not easy to put into words. Not even, in fact, for the doctor. "But when he says that barley-gruel is to be administered to a feverish patient, how am I to perceive[214] that he is feverish?" "When," he replies, "you see that he is pale." "But how will I know when he is pale?" At this point, let the doctor acknowledge the fact:[215] "If you do not have within yourself," he will say,[216] "the capacity to perceive things of this sort, then you no longer can." In like manner, the argument applies in common to other things of these sorts. **5.** It is the same way in the case of knowing the feelings; for one must contribute something oneself to any perception.

6. But perhaps someone might further raise the following sort of question: "If I in fact know these things, will I then be happy?" For they think so. But it is not like this. For none of the other sciences imparts to the learner the use and the activity either, but only the state. Similarly here, knowledge of these things does not impart the use either (for happiness is an activity, as we say[217]), but rather the state; nor does happiness consist in knowing what it comes from, but from making use of these. **7.** But the use and the activity of these is not for this study to impart;[218] for no other science imparts the use either, but rather the state.

2.11
Friendship

1. In addition to all this it is necessary to speak about friendship, what it is, what it is found in, and what it is concerned with. For since we see it extending throughout the whole of life and on every occasion, and being a good thing, it would have to be included also with a view to happiness.

2. First, then, it is presumably better to go through the puzzles and questions that are raised. Is friendship found among those who are alike, as is believed and said? For "jackdaw," they say, "sits by jackdaw," and "always a god leads like to like."[219] They also say that once when a dog always slept on the same tile, and Empedocles was asked why the dog always slept on the same tile, he said it was because the dog had

213. Reading ἐπιτελεῖν.
214. Reading αἰσθανώμαι.
215. Reading συνίστω.
216. Reading φήσει.
217. 1184b31–36, 1204a26–30.
218. Reading παραδοῦναι.
219. Homer, *Odyssey* 17.218.

something similar to the tile, implying that it was because of the likeness that the dog resorted to it.[220]

3. But then again, on the other hand, it seems to certain others that it is rather among contraries that friendship appears, for "earth," they say, "is in love with rain, when the plain is dry."[221] It is contrary, then, they say, that wishes to be a friend to contrary. For among those who are alike it is not possible for it to come about. For like, they say, has no need of like, and so forth.

4. Further, does it take work to become a friend, or is it easy to become one? At any rate, flatterers who quickly dance attendance on us are certainly not friends, though they appear to be.

5. Further, such puzzles as the following are raised. Will the excellent person be a friend to the base one? Or will he not? For friendship lies in trust and stability, but the base person is least of all of this sort. And will the base person be a friend to a base one, or is not even this the case?

6. First, then, we must determine what sort of friendship we are investigating. For there is, so people think, friendship for a god and for inanimate things; but this is not correct. For friendship, we say, exists [only] in those cases where there is reciprocal loving, but friendship for a god admits neither of reciprocal loving nor of loving at all. For it would be strange if someone were to say that he loved Zeus. **7.** Nor indeed is reciprocal loving possible from inanimate things. And there is, of course, friendship for inanimate things—for example, for wine or something else of this sort. That is why it is neither friendship for the god nor for inanimate things that we [want to] investigate further, but that for animate ones, and for those in which there is reciprocal loving.

8. If, then, one were next to investigate what the lovable is, it is nothing other than the good. The lovable and what is to-be-loved are distinct, just the wish-able-for and what is to-be-wished-for are as well. **9.** For the wish-able-for is the unconditionally good, but what is to-be-wished-for is the good for the given person. Likewise too the unconditional good is lovable, but the good for oneself is what is to-be-loved. So the **1209^{a}1** lovable is also to-be-loved, but what is to-be-loved is not lovable.

10. It is here, then, and because of this that the puzzle arises as to whether the excellent person is a friend to the base one or not. For attached in a way to the good is the good for oneself, and to the lovable what is to-be-loved; and involved with and following along with the good are the pleasant and the advantageous. **11.** There is friendship among excellent people when they reciprocally love each other. But they love each other insofar as they are lovable; and they are lovable insofar as they are good. **12.** "But will not the excellent person," someone says, "therefore not be a friend to the base one?" No, he will be. For since the good is followed, as we saw, by the advantageous and the pleasant, insofar as, though base, the base person is pleasant, to

220. *EE* $1235^{a}12$–13.
221. Euripides, Fr. 698 Nauck.

that extent he is a friend. And, again, with being advantageous, insofar as he is advantageous, to that extent he is a friend. **13.** But this sort of friendship will not, at any rate, be in accord with the lovable (for it is the good, we saw, that is lovable, and the base person is not lovable). No, but it will be in accord with what is to-be-loved. For these friendships—the one in accord with the pleasant and the one in accord with the advantageous—derive from complete friendship, the one among excellent people.

14. He, then, who loves in accord with the pleasant does not love with the friendship that is in accord with the good, nor does the one who loves in accord with the advantageous. **15.** But these friendships (the one in accord with the good, the one in accord with the pleasant, and the one in accord with the advantageous), though they are not the same, are not entirely alien to each other either, but depend in a way on the same thing. For example, we say that a knife is medical, that a human being is medical, and that a science is medical. But these are not said to be so in the same way; rather, the knife is said to be medical due to its being useful to medical science, a human being due to his being productive of health, and a science due to its being cause and starting-point.

16. Similarly, the friendships—that of excellent people, which is because of the good, that in accord with the pleasant, and that in accord with the advantageous—are not all [said to be such] in the same way. But neither are they said to be such homonymously; rather, though they are not the same, they are concerned with the same things in a way and based on the same things. **17.** If, then, someone were to say, "The one who loves in accord with the pleasant is not a friend to this person; for he is not a friend in accord with the good," such a person is having recourse to the friendship of excellent people, which is based on all these things (the good, the pleasant, and the advantageous), so that he is truly not a friend in accord with[222] *that* friendship, but rather with the one in accord with pleasure or in accord with the advantageous.

18. Will, then, the excellent person be a friend to the excellent one, or will he not? For like, they say, has no need of like. An argument of this sort, then, is seeking the friendship that is in accord with the advantageous. For if they are friends insofar as one needs the other, they are to that extent involved in the friendship that is in accord with the advantageous. **19.** But the friendship that is in accord with the advantageous was distinguished as being distinct from the friendship that is in accord with virtue or with pleasure. It makes perfect sense, then, that [excellent people] will be friends to a much greater degree. For all the things—the good, the pleasant, and the advantageous—belong to these.

20. But the excellent person will also be a friend to the base one; for insofar as he may be pleasant, to that extent he is a friend. And the base person even with the base one; for insofar as the same thing is advantageous for them, to that extent he is perhaps a friend.[223] For we see this happening when what is advantageous is the same,

222. Retaining κατ'.
223. Reading φίλος.

that they are friends because of the advantageous. So nothing will prevent some same thing from being advantageous even to base people.

21. But it makes perfect sense that the friendship among excellent people, the one that is in accord with virtue and the good, is most stable, most steadfast, and most noble. For virtue, because of which the friendship exists, is unchanging, so that it makes perfect sense that this sort of friendship is unchanging. The advantageous, on the other hand, is never the same. That is why friendship that exists because of the advantageous is not stable, but changes along with what is advantageous. **22.** It is the same way too with the friendship that is in accord with pleasure.

The friendship, then, of the best people is the one that comes about in accord with virtue, that of ordinary people in accord with the advantageous, and the one in accord with pleasure in unrefined people and people at random.

23. It happens too that people get annoyed and surprised when they find that their friends are base people. But it is not at all strange. For when friendship takes pleasure as its starting-point, and people are friends because of it, or because of the advantageous, as soon as these leave the friendship does not remain either. **24.** But often, though the friendship does remain, they were treated badly by their friend. That is why they get annoyed. But this is not unreasonable either. For your friendship with him did not exist because of virtue. That is why it is also not strange that he does none of the things that are in accord with virtue. They were not correct, then, to get annoyed. For though they made the friendship because of pleasure, they think that the one because of virtue should accrue to them. But this is not possible; for the friendship because of pleasure and the one because of the advantageous are not connected to virtue. **25.** While sharing in pleasure, then, they—not correctly—seek virtue; for virtue does not follow along with pleasure and the advantageous, but these both follow along with virtue. For it would be absurd not to think that the excellent people are most pleasant to themselves; for even base people, as Euripides says,[224] are pleasant to themselves: "For bad to bad is welded." For virtue does not follow along with pleasure, while pleasure does follow along with virtue.

26. But need there be pleasure in the friendship of excellent people, or need there not be? It would indeed be strange to say that there need not be. For if you remove their being pleasant to each other from them, they will supply themselves with other friends with a view to living together—ones that *are* pleasant. For with a view to **1210^{a}1** living together there is nothing more important than being pleasant. **27.** It would be strange, then, not to think that excellent people must, most of all, live together with each other; and this is not possible without the element of pleasure. Therefore, it must be, as makes perfect sense, that their being pleasant belongs most of all to them.

28. But since friendships haven been divided into three forms, and since in the case of these the puzzle was raised[225] as to whether friendship comes about in respect

224. *Bellerophon*, Fr. 298 Nauck. See *EE* $1238^{a}35$.
225. $1208^{b}8$–20.

of equality or in respect of inequality, the answer, then, is that it is possible in accord with either. For the one in accord with likeness is the friendship of excellent people, which is complete friendship, while the one in accord with unlikeness is the one in accord with the advantageous. For the poor person is friends with the well-off person because of his need of the things the rich one is well supplied with, and the base person with the excellent one because of the same thing; for because of his need of virtue he is friends with the person he thinks he will get it from. **29.** Among unequals, then, friendship in accord with the advantageous comes about. That is also why Euripides says: "Earth is in love with rain, when the plain is dry,"[226] on the supposition that between those contraries friendship because of the advantageous appears. For even if you wished to make fire and water the things that are most contrary, these are useful to each other. **30.** For fire perishes, they say, if it does not have liquid, as this provides it with a sort of nourishment, but it does this to the extent that the fire can master it; for if you make the liquid too great, you will produce an overmastering and extinguishing of the fire, while if it is commensurable, it will be of benefit. It is clear, then, that even between things that are most contrary friendship because of the advantageous appears.

31. All friendships, both those in respect of equality and those in respect of inequality, fit into the three we have distinguished. But in all friendships there is a difference that arises between the friends when they are not alike in loving, doing good, being of service, or something else of this sort; for when one does a thing zealously and the other deficiently, in keeping with the deficiency there is complaint and grievance.

32. Nonetheless, in the sorts of cases in which the end of the friendship is the same (for example, if both are friends with each other in accord with the advantageous, in accord with the pleasant, or in accord with virtue), the deficiency on the part of the other person is clear to see. If, then, you do more good things for me than[227] I do for you, I no longer dispute that you should be loved more by me. **33.** But in a friendship in which we are not friends because of the same thing, the differences are greater. For a deficiency on the part of either is not clear to see. For example, if one is a friend because of pleasure and the other because of the advantageous, there dispute arises; for the one whose superiority is in the advantageous does not think that the pleasure is a worthy exchange for the advantage, nor does the one whose superiority is in pleasure think that he receives in advantage a favor worthy of the pleasure. That is why differences arise more in these sorts of friendships.

34. But those who are friends in respect of inequality, since they are superior in wealth or something else of this sort, do not think that they themselves should love; instead, they think that they should be loved by those who are more in need. But it is better to love than to be loved. **35.** For loving is a sort of activity of pleasure and a

226. Euripides, Fr. 698 Nauck.
227. Reading ἤ.

good, while from being loved no activity comes about for the beloved. **36.** Further, it is better to know than to be known; for to be known and to be loved belongs even to inanimate things, while knowing and loving belong to animate ones. **37.** Further, to be productive of good is better than not to be; for the person who loves, insofar as he loves, is productive of good, while the beloved, insofar as he is beloved, is not.

38. But human beings, because of their love of honor, wish more to be loved than to love, because in being loved there is a sort of superiority; for the one who is loved is always superior in pleasure, wealth, or virtue, and the lover of honor desires superiority. **39.** And those who are in a position of superiority do not think that they themselves should love; for they think they are making a return to those who love them in those things in which they are superior. Further, the others are inferior to them, which is why they think they should not love but be loved. On the other hand, the one who is in need of money, pleasure, or virtue wonders at the one who is superior[228] in these things, and loves because he is getting these or thinks he will get them.

40. Friendships of these sorts also arise from feelings of sympathy, that is, from wishing good things for someone. But the friendship that arises in these cases does not have all the requisites; for often we wish good things for one person, yet wish to live with another. **41.** But should we say that these are friendships, or that they are feelings characteristic of complete friendship, the one that is in accord with virtue? For in the latter friendship all these are present; for there is in fact no one else we would wish to live with (for the pleasant, the advantageous, and virtue are present in the excellent person), and it is for him that we would most of all wish good things, and for none other than him to live and to live well.

42. Whether a person can have self-friendship[229]—that is, friendship toward himself—or not, let us leave aside for the moment; we will speak of it later.[230] But we do wish all these requisites for ourselves. For we wish to live with ourselves (presumably, this is actually necessary), to live well, to live, and the wishing of the good is to no one else.[231] **43.** Further, we have sympathy for ourselves most of all. For if we suffer defeat or if something else of the sort befalls us we at once feel distress. That is why it would in this way seem that there is friendship toward oneself.[232]

44. We speak, then, of these sorts of requisites (for example, sympathy, living well, and the others), by referring back either to friendship toward ourselves or to complete friendship; for all these requisites are present in both; for living together, the wish for someone's existence and well-being, and all the others are present in these. **1211^{a}1**

45. Further, it might perhaps seem that the things in which there is justice are also the ones in which there is friendship; that is also why there are as many forms of friendships as there are of just [relations]. There is, then, the just for guest-friend in

228. Reading ὑπερέχοντα.
229. Reading αὐτοφιλία.
230. $1211^{a}16$–$^{b}3$.
231. $1211^{a}32$–33, $1213^{a}10$–13.
232. Reading αὐτῷ πρὸς αὐτὸν.

relation to citizen, for slave in relation to master, citizen in relation to citizen, son in relation to father, and wife in relation to husband, and every other sort of community, in general, and there are friendships present in each of these. But the most stable would seem to be guest-friendships. **46.** For they have no common end to dispute about, as citizens do; for when these dispute with each other for superiority, they do not remain friends.

47. The next thing would be to say now whether there is friendship toward oneself or not. Since, then, as we also said a bit above,[233] we see that loving is known from the requisite particulars, that it is for ourselves that we would most wish these (good things, existence, and well-being), have most sympathy for ourselves, and wish most of all to live with ourselves, the result—if friendship is known from the requisite particulars, and we would wish the requisite particulars to belong to ourselves—is that there clearly is friendship toward ourselves, just as there is even, we said,[234] injustice toward ourselves. **48.** For since the one who does injustice is one person and the one who suffers injustice is another, and here each is one and the same person, because of this, there seemed not to be injustice toward oneself.

However, as we said,[235] when doing an investigation into the parts of the soul, since there are several, it is possible, when these are not in concord, that there is then injustice toward oneself. **49.** In a similar way to this, then, there would also seem to be friendship toward oneself. For since a friend—as we say, when we wish to say that he is a very great friend—is, we say, "my soul and another's in one," and since there are, then, several parts of the soul, there will be one soul at the time when reason and the feelings are in harmony with each other (for that way it will be one); so when it has become one soul there will be friendship toward oneself.

50. And this friendship toward oneself will be present in the excellent person; for in him alone the parts of the soul are in a good state in relation to each other, due to their not differing, since the base person, at least, is never a friend to himself, for he is always fighting with himself. At any rate, the person who lacks self-control, when he has done in action something in accord with pleasure, not long afterward regrets
1211b1 and reproaches himself. And in the case of the various vices, the base person's state is similar; for he is continually fighting with and going contrary to himself.

51. There is in fact friendship in respect of equality—for example, that of companions is in respect of arithmetical equality and capacity for good (for neither of them deserves to have more goods than the other, either in number, or capacity, or size, but rather what is equal; for companions wish to be equal). **52.** But that of father toward son is in respect of inequality, as is that of ruled and ruler, superior and inferior, wife and husband, and, in general, in those cases in which there is one who has the position of inferior or superior in the friendship. **53.** For this friendship in

233. 1211a1–5.
234. 1196a28.
235. 1196a25–30.

respect of inequality is proportional. For in the case of giving a good no one would ever give an equal one to the better and the worse, but always a greater one to the superior party. And this is the proportionally equal; for the inferior having a lesser good is in a way equal[236] to the superior having a greater one.

2.12
Paternal Friendship

1. Of all the friendships that have been mentioned it is in familial friendship in a way that loving most of all appears, and particularly in the relation of father toward son. And why exactly is it that the father loves the son more than the son loves the father? Is it, then, as some people correctly say—with the approval of ordinary people, at least—because the father has in a way conferred a benefit on the son, while the son owes him a debt of gratitude for the benefit? **2.** This cause, then, would seem to also[237] belong in the friendship that is in accord with the advantageous. But as we see it to hold also with respect to the sciences, so it holds in a way here too. **3.** I mean, for example, that in some the end and the activity are the same, and there is no other end beyond the activity. For example, for the pipe player the activity and end are the same (for playing the pipe is both his end and activity), but not for the craft of building (for it in fact has another end beyond the activity). **4.** Friendship, then, is a sort of activity, and beyond the activity of loving there is no end, but rather this itself is the end. The father is always more active in a way, deriving from the son's being a sort of product of his. And this we see to be so in the other cases too; for all feel a sort of goodwill[238] toward what they have themselves produced. **5.** The father, then, feels a sort of goodwill toward the son as being his own product, led on by memory and by hope. That is why the father loves the son more than the son does the father.

6. But there are other things that are called and that seem to be sorts of friendships that must be investigated to see if they are friendships. For example, goodwill seems to be friendship. But unconditionally, goodwill would not seem to be friendship. **7.** For **1212^{a}1** we have goodwill toward many people and on many occasions from seeing or hearing something good about them. Are we therefore also immediately friends? Surely not! For it is not the case that if someone has goodwill toward Darius in Persia, as perhaps someone did, there was immediately friendship in him toward Darius. **8.** On the other hand, goodwill would seem to be sometimes a starting-point of friendship, and might become friendship if one adds a wish to do good things, when one is capable of it, for the sake of the person one feels goodwill toward. **9.** But goodwill belongs to character and is toward character. For no one is said to have goodwill toward wine or any other inanimate good or pleasant thing. But if someone is of excellent character,

236. Reading ἴσος.
237. Retaining καὶ.
238. Reading εὔνοοι here and at 1212^{a}4.

toward him there is good-will. **10.** Good will is not separate from friendship, then, but is in the same province. That is why it seems to be friendship.

11. Concord is closely allied to friendship, if you take concord in the strict sense. For if someone makes the same suppositions as Empedocles, and the elements seem to him to be as they did to the latter, is he therefore in concord with Empedocles? Surely not! Since this sort of agreement[239] is concerned with something else. **12.** For, first, concord is found not in matters of thought but in practical ones, and in these not insofar as the parties think the same thing, but insofar as, together with thinking the same, they make, where the things they think are concerned, a deliberate choice of the same ones. For if both parties have it in mind to rule, but one has himself in mind and the other *himself*, are they now therefore in concord? Surely not! But if I wish that I rule and he wishes that I rule, in this way we are now in concord. **13.** Concord, then, is found in what is doable in action and involves a wish for the same thing. Therefore, it is establishing the same person as ruler regarding practical matters that is concord in the strict sense.

2.13
Self-Love

1. Since there is, as we say,[240] friendship toward oneself, will the excellent person be a self-lover or not? A self-lover is the one who does everything for his own sake in matters of profit. The base person, then, is a self-lover (for he does everything for his own sake), but the excellent one is not. For it is because of this that he is excellent, that he does this [or that] for the sake of another, which is why he is not a self-lover.

2. But all have an impulse toward good things and think that they should most of all possess them. This is most evident in the case of wealth and ruling office. The excellent person will sacrifice these for another, not on the supposition that they are not most fitting for him, but if he sees that another will be capable of making more use of them than himself. But other people, due to ignorance, will not do this (for they do not think that they would make bad use of good things of this sort), or due
1212b1 to an ambition to rule. **3.** But the excellent person will not suffer from either of these. That is why he is not a self-lover, at any rate, with regard to these sorts of goods, but, if at all, with respect to the noble. For this is the only thing he would not sacrifice for another, while he will sacrifice what is advantageous and pleasant.[241] **4.** When the choice, then, is with respect to the noble he will be a self-lover, but when it is said with respect to the advantageous and with respect to pleasure, the excellent person will not be a self-lover, but rather the base person will.

239. Reading τὸ τοιοῦτον.
240. 2.11.47.
241. Reading τοῦ συμφέροντος καὶ ἡδέος.

2.14
Will the Excellent Person Love Himself Most?

1. Will the excellent person love himself most, or not? In a way, he will love himself most and, in a way, not. For since we say[242] that the excellent person will sacrifice things that are good in accord with the advantageous for his friend, he will love his friend more than himself. **2.** Yes, but it is insofar as he procures the noble for himself in sacrificing them that, to that extent, he does sacrifice these sorts of things. There is, then, a way in which he loves his friend more than himself, and a way in which he loves himself most; for in accord with the advantageous, he loves his friend more, but in accord with the noble and good, he loves himself most; for he procures these for himself as being noblest. **3.** He is, then, in fact a good-lover, not a self-lover; for if indeed he does love himself, it is only because he is good. But the base person is a self-lover; for he has nothing because of which he will love himself, such as something noble, but will love himself, insofar as he is himself, without these. That is why in fact he may be called a "self-lover" in the strict sense.

2.15
Self-Sufficiency

1. The next thing to speak about would be self-sufficiency and the self-sufficient person, to see whether the self-sufficient person needs friendship in addition or not, but will be sufficient for himself also with respect to this. For even the poets say such things as "When your *daimôn* does well (*eu*) by you, what need of friends?"[243] Hence the puzzle also arises of whether the person who has all the goods, since he is self-sufficient, will also need a friend in addition. Or is it then that he will need friends most of all? For to whom will he do good? Or with whom will he live? For surely he will not spend his time alone. **2.** If, then, he will need these things, and it is not possible to get them without friendship, the self-sufficient person would need friends in addition.

3. The similarity on the basis of [the example of] the god, then, that is customarily assumed in arguments is not correct there, nor would it be useful here. For if the god is self-sufficient and needs no one, it does not follow because of this that we need no one. **4.** For there is in fact an argument of this sort stated about the god. For since, it says, the god has all the goods and is self-sufficient, what will he do? For he will not lie asleep. He will, then, contemplate something, it says. For this is most noble and most appropriate. What, then, will he contemplate? For if he will contemplate something else, he will contemplate something better than himself. But it is absurd that there is **1213^{a}1**

242. $1212^{a}36$–$^{b}2$.
243. Euripides, *Orestes* 667.

something better than the god.[244] Therefore, he will contemplate himself. But this is absurd. For if a human being were [to spend his time] looking closely at himself, we would rebuke him as indifferent [to other things]. It is absurd, then, it says, if the god will contemplate himself.

5. But let us leave aside what the god will contemplate; for the self-sufficiency about which we are making an investigation is not that of the god, but of a human being, as to whether a self-sufficient one will need friendship or not. If, then, on looking at one's friend and seeing what one's friend is and of what sort he is, he would be such[245] as another I—at any rate, if you have made a very good friend. Just as in the saying, "This is another Heracles,"[246] a friend is another I.

6. Since, then, it is a most difficult thing to know oneself, as in fact some of the wise have said, and a most pleasant one (for knowing oneself is pleasant), and we are not capable of contemplating ourselves by ourselves (that we are not capable is clear from the way in which we blame other people, but do not notice ourselves doing the same things, **7.** and this comes about because of sympathy or because of feeling—things many of us are blinded by when it comes to judging correctly), just as, then, when we wish to see our own faces, we know them by looking at a mirror, in the same way when we wish to know ourselves, we can know them by looking at our friend; for the friend, as we say, is another I. **8.** If, then, knowing oneself is pleasant, and it is not possible to know this without another who is a friend, the self-sufficient person would need friendship when it comes to knowing himself.

9. Further, if indeed it is also noble, as it is, to do good when one has the goods that come from luck, to whom will the self-sufficient person do it? And with whom will he live? For surely he will not spend his time alone; for living together is pleasant and necessary. If, then, these things are noble, pleasant, and necessary, and these are not possible without friendship, the self-sufficient person would need friendship in addition.

2.16
How Many Friends Should One Have?

1. Should one possess many friends, or few? Simply speaking, they should neither be many nor few. For if they are many it takes work to assign a part of one's love to each. For in all other things the weakness of our nature also makes us incapable of reaching far. For we do not see far with our sight either, but if you take it further than a fitting distance, sight falls short due to the weakness of our nature, and likewise in the case of hearing and all the others. **2.** By falling short in love, then, due to incapacity, one would not unjustly get complaints, and would not be a friend, for not loving except,

244. *EE* 1248a29–30.
245. Reading εἴη ἄν τοιοῦτος.
246. *EE* 1245a31–32.

of course, in name. But this is not what friendship requires. **3.** Further, if they are many, it will not be possible to cease from being pained; for when they are many, it is likely that some bit of bad luck, the occurrence of which necessarily causes pain, be happening to at least one of them. On the other hand, again, neither should they be few, one or two, but rather a number commensurable to one's circumstance and one's impulse to love.

2.17
How Friends Should Be Treated

1. Next we must investigate how one should treat a friend. But this investigation is not in respect of every friendship, but the one in which the friends complain most to each other. But they do not complain in the same way in the various ones. For example, in that of father toward son there is not the sort of complaint that people think fitting in some friendships, "as I to you, so you to me," failing which there is violent complaint there. **2.** But between unequal friends, the equal is not possible, and the friendship of father toward son is in respect of inequality, likewise that of wife toward husband, or servant toward master, and, in general, of inferior and superior. They will not, then,[247] have complaints of this sort. Instead, it is between equal friends and in a friendship between them[248] that this sort of complaint arises. So we must investigate how we should treat a friend in the friendship between equals. . . .[249]

247. Reading οὖν.
248. Reading τῇ ἐν αὐτοῖς φιλίᾳ.
249. The rest is missing.

EUDEMIAN ETHICS*

BOOK 1

1.1
What Happiness Consists In and How It Is to Be Acquired

The man who in the precinct of the god on Delos[1] made known his maxim, which he inscribed on the gateway of the temple of Leto, distinguished, as not all belonging to the same thing, the good, the noble, and the pleasant. He wrote: **1214ª1**

> The noblest thing is the most just; the best to be healthy;
> Most pleasant of all, however, is to get what one loves.[2] 5

But we do not concede this. For happiness, since it is noblest and best, is most pleasant of all.

About each thing at issue and each nature there are many speculations that involve a puzzle and need investigation; of these, some pertain to knowing only, while others also concern acquisition and action in relation to the thing at issue. With regard to those that involve theoretical philosophy alone it must be stated[3] at the opportune moment whatever is proper to the methodical inquiry. 10

But first what living well consists in and how it is to be acquired must be investigated: Are all those who merit the title of being happy, happy by nature, as with the tall, the short, or those who differ in color? Or is it through learning, happiness being a sort of scientific knowledge? Or through some sort of practice (for many things are present in human beings neither in accord with nature nor with learning, but rather with having been habituated—bad ones if they have been badly habituated, good ones if in a good way). Or is it in accord with none of these ways, but one of the two following ones: like human beings who are taken possession of by nymphs or gods, by being inspired by a sort of daimonic thing, like those who are in ecstasy; or else due to luck (for many people say that happiness and good luck are the same). 15 20

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* Translated by C. D. C. Reeve. Text: Christopher Rowe, *Aristotelis Ethica Eudemia* (Oxford, 2023).

1. Apollo; Leto is his mother.
2. *NE* 1099ª26–27.
3. 1216ᵇ36–1217ª17.

That it is by the presence of all, some, or one of these that happiness is present in human beings is not unclear. For pretty much all its origins fall under one of these starting-points; for in fact one may group together all actions resulting from thought with actions resulting from scientific knowledge.

But being happy and living in a blessed and noble way would seem to lie most of all in three things, the ones that seem most choiceworthy. For some say that the greatest good is practical wisdom, others that it is virtue, and others that it is pleasure. And about their relative importance to happiness some people 1214b1 disagree, saying that one of them contributes more to it than another, some—on the supposition that it is a greater good—that practical wisdom does so more than virtue, others that virtue does more than practical wisdom, others that pleasure does more than both of them. And to some it seems that living happily is based on all of them, to others on two, and to others that it lies in a certain one of them.

1.2
Happiness and Its Preconditions

Fixing his thought on these considerations, then, anyone capable of living in accord with his own deliberate choice posits some target for living nobly, whether honor, reputation, wealth, or education, looking toward which he will do all his actions (on the supposition that not to order one's life in relation to some end is a sign of great foolishness). Above all, then, he must first determine within himself, neither impetuously nor carelessly, in which things of ours living well consists, and which ones it is not possible for this to belong to human beings without.

For what it is not possible to be healthy without is not the same as health. And this holds in the same way too in many other cases. So neither is living nobly the same as what one is not capable of living nobly without. Among things of this sort, some are not special to health or to [noble] living, but common (one might almost say) to everything, to both states and actions (for example, without breathing, being awake, or sharing in movement nothing would belong to us, whether good or bad), while others are more special to each [individual] nature, and one must not overlook these; for eating meat and taking walks after dinner are not appropriate in the same way to being in good condition as the things mentioned.

These indeed are the causes of the dispute about happiness, about what it is and due to what things it comes about; for what it is not possible to be happy without some people consider to be parts of happiness.

1.3
Beliefs about Happiness

To examine all the beliefs that certain people hold about happiness is superfluous; for many things appear to be so to young children, the sick, and those who are deranged, but no one—at any rate, no one with understanding—would go through puzzles about these; for what these people need is not arguments but in some cases the change that comes with age, in others a medical or political corrective; for drugs are no less a corrective than blows.[4] Likewise, there is no need to investigate the beliefs of ordinary people (for they speak at random about pretty much everything, and especially about happiness); for it would be absurd to present an argument to those who need not arguments, but rather to suffer. But since there are puzzles proper to each study, it is clear that there are those concerning the most excellent life and best way of living too. These, then, are the beliefs it is well to examine; for the refutations of those who dispute [them] are demonstrations of the contrary arguments.

Besides, it furthers the work not to fail to consider things of this sort, especially as regards the ones the entire investigation must pertain to, the ones on the basis of which it is possible to share in living well and nobly (if to say "living in a blessedly happy way" is too liable to incite divine envy), and as regards the hopes of decent people that arise in each case. For if living nobly depends on what comes about due to luck or by nature, it would be a hopeless aspiration for many people (for its acquisition is neither up to them nor due to their supervision or their own study). But if it depends on one's being of a certain quality and on the actions that are one's own, the good would be a more common and more divine thing—more common, because more people can share in it; more divine, because happiness resides in those who establish themselves as being of a certain quality and in their actions.

1.4
Three Lives

Most of the disputes and the puzzles gone through will be evident if what one must consider happiness to be is correctly defined, whether it depends only on the soul's being of a certain quality, as some of the older wise people thought, or whether, though a certain quality must indeed belong to oneself, it is more a matter of one's actions being of a certain quality.

Various lives have been distinguished, and of these some are not even among the disputants for this sort of joy, but rather busy themselves in various ways for the sake of the necessities of life—for example, those having to do with the unrefined crafts, and the one having to do with money-making, and the commonplace ones

4. I.e., blows of a whip assigned as punishment for a crime.

(by "unrefined" I mean those undertaken with a view to reputation only; by "commonplace" I mean the sedentary ones and wage-earning ones; by "wealth-acquiring" I mean the commercial ones related to buying and selling). But because those assigned as conducive to happiness, the ones that were in fact mentioned previously[5] as the greatest of goods for human beings, are three, virtue, practical wisdom, and pleasure, we see that there are three lives that all who have the resources deliberately choose to live—political, philosophical, and that of indulgence.

1215b1 For, of these, the philosophical life tends to be concerned with practical wisdom and theoretical investigation concerning the truth, the political one with noble actions (for these are the ones that result from virtue), and the one of indulgence in bodily pleasures. That is why one calls one person "happy," another another, as was also said previously.[6] For Anaxagoras of Clazomenae, when asked who was happiest, said, "none of those you would consider so, but someone who would appear strange to you."[7] He replied in this way because he saw that the questioner assumed it to be impossible for someone who was not a great man, noble and rich, to merit this title, while he himself perhaps thought that it was the one living painlessly and in a pure way in the eyes of justice, or sharing in some sort of divine contemplation, who was said to be blessedly happy in the way a human being is.

1.5
Which Things in Life Are Choiceworthy

Surely there are many other things that it is difficult to judge correctly about, but it is especially difficult to do so about the one that seems easiest to everyone and that every man (supposedly) knows, namely, which of the things in life is choiceworthy, and which, when grasped, would satisfy the appetite of one who has it. For many things that happen are of the sort due to which people give up their life—for example, diseases, excessive pains, or calamities. So it is clear that it might even from the start have been choiceworthy, because of these considerations at least, not to be born at all,[8] if one were given the choice. In addition to these things, [there is] the life people live while still children; for in fact no one who was thinking correctly could abide returning to it. Further, both many of the things that involve neither pleasure nor pain, as well as many of the ones that involve pleasure, but not a noble one, are of the sort that make not existing better than living. In general, if one were to collect together all the things that people do in action and that everyone suffers, yet never voluntarily (because these are not done or suffered for their own sake), and even were

5. 1214a30–33.
6. 1214a30–b5.
7. A30 DK. See F90 51.10.
8. F75.

an unlimited amount of time added, no one for their sake would choose living over not living.

But surely, then, neither would anyone who was not a complete slave prefer living for the pleasure of nourishment alone or the pleasure of sex, when the other pleasures are subtracted, the ones that knowledge, sight, or any of the other perceptual modalities provide to human beings. For it is clear that to the one making this choice there would be no difference between being born a beast or a human being. At any rate, the ox in Egypt, which they honor as the god Apis, has a more abundant share in more of these sorts of things than many monarchs. But by the same token no one would choose living because of the pleasure in sleeping;[9] for what is the difference between sleeping in un-waking sleep from the first day to the last for ten thousand or however many years and living as a plant? That, at any rate, is the sort of life that plants seem to share in, just as infants also do. And in fact when these are first generated within the mother they continue growing, but sleep the entire time. So it is evident from these sorts of considerations that what makes living living well, and what the good is in living, eludes those investigating it.

They say that Anaxagoras, when someone went through these sorts of puzzles and asked him for the sake of what would a person choose to be born rather than not born, replied, "to contemplate the heaven and the order of the whole cosmos."[10] He for his part, then, thought it to be for the sake of a sort of scientific knowledge that the choice of living is an estimable one. On the other hand, those who regard Sardanapalus as blessed, or Smindyrides the Sybarite, or any others living the life of indulgence, all surely appear to place happiness in enjoyment. Some others, however, would choose neither any sort of practical wisdom nor bodily pleasures in preference to actions arising from virtue. At any rate, there are some people who choose these not only for the sake of reputation, but even when they do not expect to be well regarded. But most politicians do not truly merit this title; for they are not true politicians; for the [true] politician is one who is disposed to deliberately choose noble actions for their own sake, while most people fasten on living this way because of money and greed.

From what has been said, then, it is evident that everyone attributes happiness to three lives, political, philosophical, and the life of indulgence. Of these, the pleasure having to do with bodily indulgence, what it is, what sort of thing it is, and due to what sorts of things it comes about, is not unclear. So there is no need to inquire about what these are, but rather whether or not they contribute anything to happiness and in what way they contribute; and, if we must attach certain pleasures to living nobly, whether these are the ones we must connect to it; or whether, though a happy person must share in them in some other way, there are other pleasures reasonably thought to be the ones due to which he is living pleasantly, and not merely without pain.

9. *NE* 1095ᵇ31–1096ᵃ2.
10. 1215ᵇ7–14.

But these issues must be investigated later on.[11] First, we will get a theoretical grasp on virtue and practical wisdom, what the nature of each of them is, and whether they are parts of the good life, either themselves or the actions that result from them, since, if not everyone connects them with happiness, all the people worth taking account of do.

Socrates the elder thought the knowledge of virtue to be [the] end, and used to inquire what justice is, and courage, and each of the parts of virtue. Indeed, he did this reasonably. For he thought all of the virtues to be sorts of scientific knowledge, so that both knowing justice and being just would occur at the same time; for at the same time as we have learned geometry and house-building, we are actually housebuilders and geometers. That is why he used to inquire about what virtue is, but not how it comes about or from what sources. And this is what happens in the case of the theoretical sciences; for there is nothing else belonging to astronomy, natural science, or geometry than knowing and having a theoretical grasp on the nature of the things that are the underlying subjects of those sciences—nonetheless, nothing prevents them from being coincidentally useful to us in relation to many of the necessities of life.

In the case of productive sciences, on the other hand, the end is distinct from the science and from knowledge—for example, health is the end of medicine and good legislative order, or something else of this sort, is the end of politics. It is noble, of course, to know each of the noble things. Nonetheless, as regards virtue, knowing what it is is not the most estimable thing, but rather knowing what it comes from. For we do not wish to know what courage is, but rather to be courageous, nor to know what justice is, but rather to be just, just as we also wish to be healthy rather than to know what health is, and to be in a good state rather than to know what it is to be in a good state.

1.6
The Method of Inquiry

Concerning all these issues we must try to seek conviction by means of arguments, using the things that appear to be so as witnesses and paradigms. For the best thing is if human beings are in evident agreement with all that we are going to say; but, if not, that they are so in a way at least, which is precisely what they will do once we have made them change their minds; for each one has something of his own related to the truth, and it is from such [views] that it is necessary to somehow prove [what we can] about these issues; for on the basis of what is truly but not perspicuously stated, we will make progress toward perspicuousness, always substituting what is more knowable for what is usually expressed in a confused way.

11. *NE* 1152b1–1154b31.

In each methodical inquiry, arguments stated in a philosophical way differ from those not stated in a philosophical way. That is why even politicians should not regard as superfluous the sort of theoretical investigation that makes evident not only the that but also the why. For this is the sort of thing that is philosophical in each methodical inquiry. Yet much caution is needed here. For there are those who, because it seems to be characteristic of the philosopher never to speak at random but rather in accord with argument, often escape notice when they state arguments that are foreign to the study and empty (sometimes they do this through ignorance, sometimes through boastfulness). Under the influence of these even people of experience and capable of doing things end up getting taken in by those who neither have nor are capable of architectonic or practical thought. And they suffer this fate due to lack of educatedness; for lack of educatedness regarding each thing is being incapable of judging arguments proper to that thing from those alien to it.

It is also correct to judge separately the argument for the cause and what is being proved, both because of what was just said, that one must not in all cases pay heed to what is due to argument, but often rather to what appears to be so (but as things stand, when people are unable to refute [an argument], they feel compelled to put their trust in what has been stated) and because often what seems to have been proved by argument is true, yet not due to the very cause that the argument claims. For it is possible to prove a truth through a falsehood, as is clear from the *Analytics*.[12]

1.7
The Greatest of Human Goods

And having made these remarks by way of a preface, let us start first, as was said,[13] from those first things that are not stated perspicuously, seeking to discover in a perspicuous way what happiness is. Happiness is surely agreed to be the greatest and best of human goods. We say "human" because perhaps there could also be happiness for some other superior being—for example, a god. For of the other animals, all the ones that are inferior in nature to human beings, none shares in meriting this title; for no horse, bird, or fish is happy, nor any other being that does not, as the name suggests,[14] have in its nature a share of something divine. Instead, one lives better and another worse in accord with some other way of sharing in good things.

But that this is the way things stand must be investigated later on.[15] For now, though, let us state that some good things are doable in action by a human being, others not doable in action. We state it this way because some beings have no share in

12. *APr*. $53^{b}8$–10, $57^{a}40$–$^{b}17$, *APo*. $88^{a}20$–26.
13. $1216^{b}26$–36.
14. *Eudaimonia* ("happiness") derives from *eu* ("well," "good") and *daimôn*, and so has the etymological meaning of being blessed with a good *daimôn*.
15. There is no focal discussion of this issue in *EE*.

movement, so not in the [relevant] goods either, and perhaps these are the things that are best by nature. And some things are doable in action but doable only by beings superior to us. But since things are said to be achievable by action in two ways (for both the things for whose sake we do an action and the things we do for the sake of these have a share in action—for example, we put both health and wealth among the things achievable by action, and also the things we do for the sake of these, the health-producing and wealth-acquiring ones), it is clear that happiness too must be put down as the best of the things achievable by action by a human being.

1.8
What the Best Good Is

We must investigate, therefore, what the best is, and in how many ways something is said to be so. There appear to be especially three beliefs about this. For they say that the good itself is the best thing of all, and moreover that the good itself is that to which it belongs both to be the first among goods and the cause, by its presence, of other things being good; and that both these things belong to the Form of the good. (By "both" I mean being the first among goods and being the cause, by its presence, of other things being good); for, indeed, "good" is said especially truly of the Form; for it is by participation in it and similarity to it that the other things are good, and it is first among the goods; for if the thing participated in is done away with, the participants in the Form—the ones that are said to be good by participating in it—are done away with too, and what is first bears this relation to what is posterior. So the good itself is the Form of the good; and it is indeed separable from its participants, just as is also the case for the other Forms.

To investigate this belief fully, then, belongs to another sort of occasion, that is, to one that, of necessity, is in many ways more logico-linguistic (for arguments that are at once both destructive and common are in accord with no other science[16]). But if one must speak succinctly about these issues, let us say, first, that to speak of there being a Form not only of good but of anything else whatever is to speak in a logico-linguistic and empty way. This has been investigated in many ways both in the external accounts and in the philosophical ones. Further, even if there most of all are Forms and a Form of the good, they are of no use at all either in relation to living a good life or in relation to actions.

For "good" is said of things in many ways, in as many ways indeed as "being" is; for indeed "being," as was determined elsewhere,[17] signifies the what-it-is, quality, quantity, when, and in addition what is changed and what changes things. And the good is found in each of these categories: in substance, the understanding and the

16. I.e., dialectic.
17. *Met.* 1017a22–30.

god; in quality, the just; in quantity, the moderate; in time, the opportune moment; and in change, the one teaching and the one being taught. Just as, then, there is not some one being embracing the things mentioned, so too neither is the good one thing, nor is there one science either of being or of good. But neither is it up to one science to get a theoretical grasp even on the goods said of things in a categorially similar way—for example, the opportune moment or the moderate. On the contrary, distinct sciences get a theoretical grasp on distinct sorts of opportune moment, and distinct ones on distinct sorts of the moderate—for example, in the case of nourishment, medicine and athletic training get a grasp on the opportune moment and the moderate, in the case of military actions, generalship does, and in this way distinct ones on distinct sorts of action, so that to get a theoretical grasp even on the good itself can scarcely be up to one science.

Further, in such cases where there is a prior and a posterior, there is no common thing beyond these cases, and it separable. For then there would be something prior to the first thing; for what is common and separable is prior because, were the common one done away with, the first would be done away with—for example, if the double is the first multiple, the multiple predicated of all of them in common cannot be separable from them; for it would then be prior to the double. Or else the common thing turns out to be the Form—for example, if one were to make the common thing separable. For if justice is a good, and courage, then there is, they say, a good itself. The "itself," then, is added to the common account. And what would this be except what is eternal and separable? Yet what is white for many days is no more white than what is white for one day, so that neither is the common good the same as the Form;[18] for the common one belongs to all [goods].

The good itself must be proved in a way opposite to the one in which they prove it at present. For at present they start from things that are not agreed to possess the good, and from these they prove the ones that are agreed to be good: it is from numbers that they prove that justice is a good, and that health is a good; for these are [sorts of] order and number, on the supposition that the good belongs to numbers and units because the one is the good-itself.[19] But they should start from the agreed goods (for example, health, strength, and temperance), and prove that the noble is present even more in immovable things; for the former things are all [cases of] order and rest. Therefore, if those are [sorts of order], the latter [immovable] ones are so even more, as these things[20] belong even more to them.

Dangerously metaphorical, too, is their demonstration that the one is the good itself, on the grounds that the numbers seek it. For they also do not say clearly how they seek it, but state this in too simple a way. Besides, how is one to suppose that desire is present in things that are not living? They should busy themselves more

18. Which is eternally white.
19. *Met.* $1091^{b}13$–14.
20. I.e., order and number.

about this, and not claim, without argument, what is not easy to believe even with argument. And the assertion that all beings seek a certain single good is not true; for each thing desires its own good: an eye, sight; a body, health; and in the same way another thing, another good.

Such puzzles have it, then, that there is not a good itself, and that it is not useful to politics; instead, there is a special good for politics, just as there is a special good for the others[21]—for example, in the case of physical training, good condition. {And further, there is what has been written in the argument: either the Form itself of the good is not in fact useful to any science or it is useful to all alike.}[22] Further, it is not doable in action. Similarly, the common good is not the good-itself either (for it would belong even to a small good), nor is it doable in action. For medicine does not busy itself with how anything whatever will come to belong to something, but in what way health will. And likewise too in the case of each of the other crafts. But good is said of things in many ways, and part of it is noble, and some good is doable in action, some not. But the sort of good that is doable in action, the for-the-sake-of-which, is not the one found in immovable things.

It is evident, then, that neither the Form of the good nor the common good is the good itself that we are seeking (for the former is immovable and not doable in action, the latter, though movable, is not doable in action), but rather it is the for-the-sake-of-which as the end that is the best good, a cause of the ones falling under it, and first of all [of them]. So the good itself would be this: the end of the things doable in action by a human being. And this falls under the science with control over all sciences. And this science is politics, household management, and practical wisdom. For these states differ from the others in being of this sort. Whether they differ at all from each other must be stated later on.[23]

That the end is a cause of the things falling under it is made clear by teaching. For teachers, after defining the end, prove that each of the other things is a good; for the for-the-sake-of-which is a cause. For example, since being healthy is this, necessarily this is advantageous for it. And the healthy is a cause of health as cause of movement, but then it is a cause of health's existence not of its being good. Further, no one proves that health is good, unless he is not a doctor but a sophist (for they are the ones who produce sophistries by using alien arguments), any more than he proves any other starting-point whatever.

But the good as end for a human being, and the best thing doable in action, must be investigated to see in how many ways the best one of all [is said of things], since it is best.

21. I.e., crafts or sciences.
22. Probably a gloss amplifying Aristotle's own summing up.
23. 5.8 = *NE* 6.8.

BOOK 2

2.1
Virtue of Character and of Thought; the Work of the Human Soul; Happiness

After this, taking a new starting-point, what comes next must be stated. All good things, then, are either external or within the soul, and the more choiceworthy of these are the ones within the soul, just as we distinguish them even in the external accounts; for practical wisdom, virtue, and pleasure are within the soul, and some or all of these seem to everyone to be the end. Among those within the soul, some are states or capacities, others activities or movements.

Let this be assumed too about virtue, that it is the best disposition, state, or capacity of each of the things that has some use or work. This is clear from induction. For **1219ª1** we suppose all cases to be this way. For example, that there is a virtue of a cloak; for it has a work and a use; and the best state of the cloak is its virtue. Likewise in the case of a ship, a house, and the others. So too in the case of the soul; for the soul has a certain work. And let the work of the better state, then, be better.

Also, as the states stand in relation to each other, so let the works that derive from them stand in relation to each other too. And the work of each thing is its end. Therefore, it is evident from this that the work is better than the state; for the end, as end, is best; for it was assumed that the best thing and the last thing, for the sake of which all the others [exist], is an end. Therefore, that the work is better than the state and the disposition is clear.

But work is said of things in two ways. For of some things the work is beyond the use—for example, the work of the craft of building is a house, not the process of building, and the work of the craft of medicine is health, not the process of making healthy or medically treating. In the case of other things, the use is the work—for example, the work of sight is seeing, and the work of mathematical science is contemplation. So it is necessary, where the use is the work, for the use to be better than the state.

Having made these determinations in this way, let us say that the work of a thing and the work of its virtue are the same, though not in the same way. For example, the work of the craft of shoemaking, and of the process of shoemaking, is a shoe. If, then, there is some virtue of the craft of shoemaking and of an excellent shoemaker, the work is an excellent shoe. And it is the same way in other cases. Further, let the work of the soul be to produce life, and of this using and being awake. For sleep is a sort of idling and resting. So, since it is necessary for the work of the soul and its virtue to be one and the same, the work of its virtue would be excellent living. This, therefore, is the superior good,[24] which is precisely what happiness was [agreed to be].[25]

24. Reading τὸ πλέον ἀγαθόν.
25. $1217^{a}22$–23.

This is clear from our assumptions; for happiness was assumed to be the best thing. But the ends within the soul and the best goods are either states or activities. So, since the activity is better than the disposition, and the best activity is of the best state, and virtue is the best state, the activity of the soul's virtue will be the best thing. But happiness too was assumed to be the best thing. Therefore, happiness is the activity of the good soul. But since happiness was agreed to be something complete, and living can be complete or incomplete, and virtue is the same way (for in one case it is a whole, in another a part), and the activity of what is incomplete is itself incomplete, happiness would be the activity of complete living in accord with complete virtue.

The things that seem to be so to all of us are a witness that we are stating the kind and defining mark of happiness correctly. For both doing well in action and living well are the same thing as being happy, and each of these, both living and action, is a use and an activity (for the practical [life] is the [life] of using; for the coppersmith makes a bridle, while the horseman uses it), and one cannot be happy either for [only] one day, or as a child, or for [only] an entire stage of one's life. That is also why Solon had it right about not felicitating someone while he is alive, but only when life attains completion; for nothing incomplete is happy; for it is not a whole.

Further, awards of praise for virtue are due to works, and encomia are for works, and it is the winners who get the victory crowns, not those who have the capacity to win but do not win. And one judges what sort of person someone is on the basis of his works. Further, why is happiness not praised? It is because the other things are praised because of it, either by being referred back to it, or by being parts of it. That is why felicitation, praise, and encomium are all distinct. For an encomium is a speech about a particular work, while praise is for a person's being universally of the relevant sort, and felicitation pertains to the end.

Also, [the resolution of] the puzzle that is sometimes raised is clear from these considerations, as to why excellent people are no better than base ones for half their life, for all are similar while asleep. The cause is that sleep is an idling of the soul, not an activity. That is why, if there is some other part of the soul, for example, the nutritive part, its virtue is not a part of the whole virtue, just as neither will the virtue of the body be; for the nutritive part is more active in sleep, while the perceptual part and desiring part are incompletely active in sleep. But insofar as they share in some way in movement, even the things that appear [in the dreams] of better people are better, unless due to illness or disability.

Next, we must get a theoretical grasp on the soul; for the virtue is virtue of soul, and not coincidentally so. But since it is human virtue we are seeking, let us assume that there are two parts of the soul that share in reason, but do not both share in reason in the same way. Instead, one does so by being prescriptive, the other by being naturally obedient and listening. And if there is some part that is non-rational in another way, let us set it aside. It makes no difference whether the soul is divisible into parts or not divisible into parts; it still has different capacities, including the ones mentioned—just as in a curve the concave and the convex are inseparable, and the

straight and the white [in a line]; and yet the straight is not white, except coincidentally, and not in its substance.

And again if there is some other part of the soul (for example, the vegetative), it has been excluded. The parts mentioned are special to the human soul. That is why the virtues of the nutritive part and the part responsible for growth are not human virtues either; for if a part belongs to a human being insofar as he is a human being, rational calculation must be present, both starting-point and action. But rational calculation is a starting-point not of rational calculation but of desire and feelings. **1220^{a}1** Therefore, it is necessary for it [the human soul] to have these parts. And just as good condition is composed of the virtues of the parts, so too is the soul's virtue, insofar as it is an end.

There are two forms of virtue, one of character, the other of thought; for we praise not only the just but also those who comprehend and those who are theoretically wise; for virtue, or its work, was assumed to be praiseworthy. These are not themselves [intrinsically] active, but there are activities of them. But since the virtues of thought involve reason, these sorts of virtue are virtues of the part that has reason, which is the prescriptive part of the soul insofar as it has reason, while the virtues of character are virtues of the part that, though non-rational, is disposed to follow in accord with nature the part that has reason; for we do not say what sort of character someone has when we say that he is theoretically wise or clever, but when we say that he is mild-mannered or rash.

Next, we must investigate, first, virtue of character, what it is and what sorts of parts it has (for it leads up to this), and through what means it comes about. We must seek them, of course, as all who seek things in other areas do, having something in hand, so that it is always through things said truly but not in a perspicuous way that we try to grasp what is said truly and in a perspicuous way. For as things stand we are in a condition similar to having that health is the best disposition of the body or that Coriscus was the darkest-skinned man in the marketplace; for we do not know what either of the two of them is, but nevertheless being thus equipped furthers the work of knowing what each of them is.

Let it be assumed, then, first, that the best disposition comes about due to the best things, and that doing the best actions, as regards each thing, is due to the virtue of each—for example, the best exercises and nourishment are the ones due to which good condition comes about, and due to good condition the best exercises. Further, every disposition is brought about and destroyed due to the same things, as health is, due to nourishment, exercise, and season. These things are clear from induction.

Therefore, virtue too is a disposition of this sort, one brought about due to the best movements having to do with the soul, and from which the best works of the soul are put into action and the best feelings. And it is due to the same things that in one way virtue comes about, while in another way it is destroyed, and the use of it is related to the same things that cause it to grow or wither, and the ones in relation to which it disposes things in the best way. A sign of this is that both virtue and vice

are concerned with pleasures and pains; for correctives, being treatments, and being effected by means of contraries, just as in other cases, are by means of these.

2.2
Character, Feeling, Capacity, and State

It is clear, therefore, that virtue of character is concerned with pleasures and pains. But character (*êthos*) exists, as even its name signifies, because it develops due to habit (*ethos*), and something is habituated due to conduct that is not innate by being repeatedly moved in a certain way, so that it is then capable of being active in that way (something we do not see in inanimate things; for even if you throw a stone upward ten thousand times, it will never do this except by force). Hence, since [all that is so], let character be this: a quality of the soul of someone capable of following in accord with prescriptive reason.

It must be stated, then, what it is in the soul that our characters have the qualities they do in accord with. And it is in accord with the capacities for feelings, in accord with which people are said to be capable of feeling, and in accord with the states, in accord with which people are said, in relation to the feelings, to feel them in a certain way, or not to feel them. {Next, is the division, made in separate contexts,[26] between feelings, capacities, and states.}[27] By "feelings" I mean things of this sort, anger, fear, shame, appetite, and, in general, things that are for the most part accompanied intrinsically by perceptible pleasure or pain. And, though in accord with these, a person is not of a certain quality, but [just] feels them, in accord with capacities, a quality [is present]. By "capacities" I mean the ones in accord with which people are said to be active in accord with feelings—for example, irascible, impassive, prone to sexual desire, having a sense of shame, shameless. States are what are causes of these being present either in accord with reason or in a contrary way—for example, courage, temperance, cowardice, and intemperance.

2.3
Virtue as a Mean (1)

Having made these determinations, it must be grasped that in everything continuous and divisible there is excess, deficiency, and a mean, and these may be either in relation to each other or in relation to us—for example, in physical training, in medicine, in building, in navigation, and in any action whatever, whether based on scientific knowledge or not based on scientific knowledge, and whether based on

26. Reference unclear.
27. Secluded as a gloss.

craft knowledge or not based on craft knowledge; for movement is continuous and action is movement.

But in all cases the mean relative to us is best; for this is as scientific knowledge and reason prescribe. And in all cases it also produces the best state. This is clear through induction and through argument. For contraries destroy each other, and the extremes are contrary both to each other and to the mean; for the mean is each contrary in relation to the other—for example, the equal is greater than the smaller and smaller than the greater. So it is necessary for virtue of character to be concerned with certain means and to be a certain mean. Therefore, it must be grasped what sort of mean virtue is, and what sorts of means it is concerned with. For the sake of a paradigm, then, let us take, and get a theoretical grasp on, each item from the following table:

irascibility	impassivity	{mild-manneredness	
rashness	cowardice	courage	
shamelessness	bashfulness	sense of shame	**1221^{a}1**
intemperance	insensibility	temperance	
enviousness	nameless	indignation	
profit	loss	justice	
wastefulness	ungenerosity	generosity	
boastfulness	self-deprecation	truthfulness	
flattery	churlishness	friendliness	
ingratiation	surliness	dignity	
softness	long-sufferingness	resilience	
conceit	smallness of soul	greatness of soul	
extravagance	niggardliness	magnificence	
unscrupulousness	foolishness	practical wisdom}	

These affections, and others like them, occur in souls, and they are all said of things due in some cases to excess, in others to deficiency.[28]

For an irascible person is the one who gets more angry than one should, and more quickly, and at more things than one should; an impassive one is the one who is deficient in whom he is angry at, and when, and how; a rash person is the one who does not fear the things one should, nor when nor as one should; a cowardly one is the one who fears even things one should not, when one should not, and in a way one should not.

Similarly, an intemperate person is the appetitive one and excessive in every possible way; an insensible one is the one who is deficient and has no appetite even for what is better and in accord with nature, but is as insensitive as a stone. A profit-loving person is the one who tries to get more from every source; a self-sacrificer is the one who does so from no source, or from relatively few.

28. The third column, therefore, should perhaps be secluded as a careless addition.

A boastful person is the one who pretends to be more than he really is; a self-deprecator is the one who pretends to be less. Again, a flatterer is the one who is more ready to join in praise than is noble; a surly person is the one who is less ready. And the one who is overready to please is ingratiating; the one who is ready in few cases, or scarcely ever, is churlish.

Further, the one who is never ready to withstand pain, not even if it is better to do so, is soft; the one who alike withstands every pain is strictly speaking nameless, but by metaphorical transference is said to be hard, hardy, and long-suffering. A conceited person, on the other hand, is the one who thinks too highly of himself; a small-souled one is the one who thinks too little.

Further, an extravagant person is the one who goes to excess in every expenditure; an ungenerous person is the one deficient in all of them. Likewise too with the niggardly person and the pretentious one; for the latter exceeds what is appropriate, while the former falls short of what is appropriate. The unscrupulous person tries to get more in every way and from every source; the foolish one does not do so even from where one should. A person is envious by being pained at more cases of others' doing well than one should (for the envious are pained even by the doing well of those who deserve to do well); the person who is the contrary is more nameless, but
1221b1 is the one who is excessive by not being pained even at those who are undeservedly doing well; he is tolerant, like a glutton toward nourishment, while the other is intolerant in accord with his envy.

It is superfluous to define in each case that the relationship not be coincidental; for no other science, whether theoretical or productive, whether in what it says or what it does, adds this to its definitions. Instead, it is a response to the sophistries of the craftsmen of logico-linguistic arguments. Let us define them, then, simply in this way, but do so more exactly when we speak about the opposite states.

These affections themselves have forms with different names depending on whether the excess is in time, in intensity, or in relation to which thing is producing the feelings. I mean, for example, that a person is quick-tempered by being affected more quickly than one should, while the choleric person too is harsh by being so more than one should, bitter by tending to preserve his anger, violent and abusive by the punishments resulting from his anger. Gourmands, gluttons, and drunkards, on the other hand, [are so named] with reference to whatever sort of nourishment they have the affective capacity for enjoying contrary to reason.

One must not fail to recognize, however, that some of the [faults] we are talking about cannot be taken to lie in the how, if how is taken to lie in being affected more [or less]. For example, a person is not an adulterer by seducing married women more than one should (for there is no such thing). Instead, [adultery] itself is surely a sort of depravity; for both the affection and its being of such-and-such a quality are said in combination in the name. Wanton aggression is similar too. That is why, in fact, people dispute the accusation, saying that though they did have sexual intercourse, it was not adultery (for they were acting in ignorance or were compelled), and that,

though they struck a blow, it was not wanton aggression. And it is the same way too in other cases of this sort.

2.4
Virtue, Pleasure, and Pain

Having grasped these things, it must next be stated that since there are two parts of the soul, and virtues are distinguished in accord with these, there are those of the part that has reason, which are virtues of thought, whose work is truth, either about how things are, or how they come to be; and there are those of the part that is non-rational but has desire (for not every part of the soul has desire, assuming the soul is divisible into parts). It is necessary, then, for character to be base or excellent because of pursuing or avoiding certain pleasures and pains.

This is clear from the distinctions having to do with feelings, capacities, and states. For the capacities and states concern feelings, and feelings are distinguished by pain and pleasure. So, because of both these considerations and the things posited previously[29] it follows that every virtue of character is concerned with pleasures and pains. For whatever things a state of the soul naturally becomes better or worse due to, these are the ones it is related to and concerns. And people are base because of pleasures and pains, we say, by pursuing or avoiding them either as they should not or the ones they should not. That is also why everyone readily defines the virtues as absence of feeling, and rest where pleasure and pains are concerned, and the vices on the basis of their contraries.

2.5
Virtue as a Mean (2)

Since virtue has been assumed[30] to be the sort of state from which people are doers of the best actions, and in accord with it are most excellently disposed toward what is best (where best and most excellent is what is in accord with correct reason), and this is the mean between excess and deficiency that is relative to us, it would be necessary for virtue of character in each case to be a mean, and to be concerned with certain means in pleasures and pains, in pleasant and painful things. The mean will sometimes be in pleasures (for there is also excess and deficiency [in these]), sometimes in pains, and sometimes in both. For the one who enjoys excessively is excessive in pleasure, and the one who is pained excessively is so in the contrary way, and these either unconditionally or in relation to some defining mark—for example, when not

29. $1220^{a}23$–38, $1220^{b}34$–36.
30. $1220^{a}30$–38, $1220^{b}34$–36.

being pained or pleased as ordinary people are; the good person, however, is pained or pleased as one should be.

But since there is not a certain state due to which a person having it will be of the sort in the one case to receive an excess, in the other a deficiency, of the same thing, it is necessary, just as these are contrary to each other and to the mean, for the actions also in this way to be contrary to each other and to virtue.

Nonetheless, it does happen that in some cases all the contraries are quite evident; in others it is those on the side of excess, and sometimes it is those on the side of deficiency. The cause of the discrepancy is that the inequality or similarity in relation to the mean is not always to the same things, but rather sometimes a person may pass more quickly from excess to the mean state, sometimes from deficiency, and it is the one who is further away that seems more contrary to it—just as with the body too, in the case of exercises, excess is healthier than deficiency, and is closer to the mean, while in the case of nourishment, deficiency is healthier than excess. So too the deliberately choosing states that promote a love of physical training will be more health-friendly in each deliberate choice—in the one case, in those who exercise more, in the other in those who are more abstemious; and, in the one case, the person who does not exercise is contrary to the mean and to what reason prescribes, and not both [of those others], and, in the other, it will be the one devoted to indulgence and not the one who goes hungry.

This comes about because from the outset our nature is not in the same way distant from the mean in all cases, but rather we are less lovers of exercise, more devoted to indulgence. Likewise, this holds too as regards the soul. We assume as contrary [to the mean] that state to which we and ordinary people are more prone to make errors, while the other one, as if non-existent, escapes our notice (for because of its rarity, it is not perceived)—for example, anger is contrary to mild-manneredness and the angry person to the mild-mannered one. And yet there is also excess in the case of gentleness, being conciliatory, and not getting angry when beaten. But people of that sort are rare, and it is in the other direction that everyone more inclines. That is also why the spirit is not given to fawning.

Since the catalog of the states belonging to each of the feelings has been grasped, both the excesses and the deficiencies, and of the states contrary to these, in accord with which people are in accord with correct reason (what correct reason is and to what defining mark one should look to in saying what the mean is, must be investigated later on[31]), it is evident that all the virtues and vices of character are concerned with excesses and deficiencies of pleasures and pains, and that pleasures and pains come about due to the states and feelings mentioned. But surely the very best state concerning each is the mean. It is clear, therefore, that the virtues will be all or some of these means.

31. 1249a23–b25.

2.6
Human Beings as Starting-Points of Action

Let us, then, take another starting-point for the ensuing investigation. All the substances that are in accord with nature are, to be sure, starting-points of a certain sort, which is why each one is capable of generating many other substances of the same sort—for example, a human humans, and, similarly, an animal animals and a plant plants. But in addition to these the human being is, alone among the animals, at any rate, a starting-point of certain actions; for we would not say of any of the others that it does actions.

Among starting-points, however, those of the sort from which movements first stem are said to be controlling, and most rightly so those from which what does not admit of being otherwise stems, by which, presumably, the [primary] god rules. But in the case of immovable starting-points (for example, in that of mathematical ones), there is no element of control, and yet they are said, at any rate, to be [starting-points] on the basis of similarity; for there too if the starting-point is moved, then, especially, so would all the things proved change, though they do not change themselves by one doing away with the other, except by doing away with a hypothesis and proving something through that. But the human being is a starting-point of a certain sort of movement; for an action is a movement.

But since, as in other cases, the starting-point is a cause of what is or comes to be because of it, we must understand it just as in the case of demonstrations. For if it is necessary, if a triangle contains [angles equal to] two right angles, for a quadrilateral to contain four right angles, it is evident that the cause of this is the triangle having two right angles. At any rate, if the triangle changes, it is necessary for the quadrilateral to change as well—for example, if the triangle has three, the quadrilateral has six, if it has four, eight. And if it does not change, but stays such as it is, it is necessary for the other to stay such as it is. That what we are attempting to prove is necessary is clear from the *Analytics*.[32] Now, though, we can neither say in an exact way that it is not so, nor that it is so, except for this much: if nothing else is a cause of the triangle's being this way, then this would be a sort of starting-point and cause of what follows from it.

So if indeed some of the beings admit of being contrary to the way they are, it is necessary for their starting-points also to be of this sort. For what results from things that hold of necessity is necessary, while what results from those others admits of turning out in contrary ways. And many things of this sort are up to human beings, and the starting-points of these are human beings themselves. So it is evident that whatever actions the human being is a starting-point and controller of admit of both coming to be and not doing so, that their coming to be or not is up to himself, and that of these, at any rate, he is in control of their being or not being. And whatever

32. *APo*. 1.4.

is up to oneself to do or not to do, of these one is oneself a cause; and whatever one is a cause of is up to oneself.

Since both virtue and vice and the works due to them are in the one case praiseworthy and in the other blameworthy (for what is blamed or praised is not what comes about due to necessity, luck, or nature, but rather what we ourselves are causes of—for whatever someone else is the cause of, he is the one to whom the blame or the praise belongs), it is clear that both virtue and vice are concerned with what one is oneself the cause of, as starting-point of actions. Therefore, what sorts of things one is a cause of, as starting-point of actions, must be grasped. We are all agreed that each is a cause of whatever ones are voluntary and in accord with his deliberate choice, while of whatever ones are involuntary, he is not a cause. But it is clear that all the ones he deliberately chooses are also voluntary. It is clear, therefore, that both virtue and vice would concern things that are voluntary.

2.7
Voluntary and Involuntary (1)

Therefore, what the voluntary is, what the involuntary is, and what deliberate choice is must be grasped. Since virtue and vice are defined in terms of these, let us first investigate the voluntary and the involuntary. They might seem to concern one of three things, either being in accord with desire, in accord with deliberate choice, or in accord with thought—the voluntary being what is in accord with one of them, the involuntary being contrary to one of them. But desire in turn is in three divisions: wish, spirit, and appetite. So these must be distinguished, and, first, what is in accord with appetite.

Everything that is in accord with appetite would seem to be voluntary. For everything involuntary seems to be forced, and what is forced is painful, as is everything one is compelled to do or undergo. As Evenus says, "every necessary thing, indeed, has a troublesome nature."[33] So if something is painful, it is forced, and if it is forced, painful. Everything contrary to appetite is painful (for appetite is for the pleasant), so that it is forced and involuntary. Therefore, what is in accord with appetite is voluntary; for these are contrary to each other.

Further, all depravity makes one more unjust, lack of self-control seems to be [a sort of] depravity, and the person who lacks self-control, he who acts in accord with appetite, is such as to act contrary to rational calculation, and acts without self-control whenever he is active in accord with appetite. But acting unjustly is voluntary. So the person who lacks self-control will be acting unjustly by acting in accord with
1223b1 appetite. Therefore, he will act voluntarily, and what is in accord with appetite will be

33. Fr.8 Diehl.

voluntary. For it would indeed be strange if those who come to lack self-control will [thereby] be more just.

On the basis of these considerations, then, it would seem that what is in accord with appetite is voluntary, but on the basis of the following ones, the contrary. For everything that one does voluntarily, one does wishing to do it, and what one wishes to do, one does voluntarily. But no one wishes for what he thinks to be bad. But then the one who acts without self-control does not do what he wishes; for to act, due to appetite, contrary to what one thinks to be best, is to act without self-control. So the result will be that the same person acts voluntarily and involuntarily at the same time. But this is impossible.

Further, the self-controlled person will act justly, and more so than the one who lacks self-control, for self-control is a virtue, and virtue makes people more just. But one acts with self-control whenever one acts contrary to appetite and in accord with rational calculation. So, if acting justly is voluntary, so too is acting unjustly (for both seem to be voluntary, and it is necessary, if the one is voluntary, for the other to be so as well). But acting contrary to appetite is involuntary. Therefore, the same person will do the same action voluntarily and involuntarily at the same time.

The same argument also applies to spirit. For lack of self-control and self-control also seem to have to do with spirit, just as with appetite, that is, what is contrary to spirit is painful, and restraining it forced. So, if what is forced is involuntary, everything that is in accord with spirit would be voluntary. And Heraclitus too seems to say, looking to the strength of spirit, that preventing it is painful; "for it is difficult," he says, "to fight against spirit; for it pays with soul."[34]

But if it is impossible to do the same action voluntarily and involuntarily at the same time in regard to the same respect of the same thing, what accords with wish will be more voluntary than what accords with appetite and spirit. There is a proof of this; for we do many actions voluntarily without anger or appetite.

It remains, therefore, to investigate whether the wished and the voluntary are the same thing. But this too appears impossible. For it is assumed by us, and seems to be the case, that depravity makes people more unjust, and lack of self-control seems to be a sort of depravity. But [if the wished and the voluntary are the same thing], the contrary will follow. For no one wishes for what he thinks to be bad, yet one does it when one comes to lack self-control. If, then, acting unjustly is voluntary, and the voluntary is what is in accord with wish, when one comes to lack self-control one will no longer act unjustly, but will be more just than before coming to lack self-control. But this is impossible.

On the one hand, therefore, it is evident that the voluntary is not acting in accord with desire, nor the involuntary acting contrary to desire.

34. B85 DK.

2.8
Voluntariness, Deliberate Choice, Force, and Compulsion

On the other hand, that the voluntary is not acting in accord with deliberate choice is in turn clear from what follows. For what is in accord with wish has been demon-
1224a1 strated[35] not to be involuntary; rather, everything that one wishes is also voluntary. (But what has alone been proved is that it is in fact possible to act voluntarily not wishing to.) But there are many things that we do all of a sudden wishing to do them;
5 but no one deliberately chooses all of a sudden.

If it is necessary, as we saw,[36] for the voluntary to be one of these three things, either [acting] in accord with desire, or with deliberate choice, or with thought, and yet it is not two of these, it remains for the voluntary to lie in acting on the basis of a certain way of thinking.

Further, advancing the argument a little, let us conclude the definition of the
10 voluntary and the involuntary. For it seems that doing something by force and not by force are proper to the things mentioned; for we say both that what is forced is involuntary and that everything involuntary is forced. So we must first investigate the "by force," what it is, and how it stands in relation to the voluntary and involuntary.
15 It seems that, in the case of action, what is forced and what is compelled, and force and compulsion, are opposed to the voluntary and to persuasion. Universally, we speak of force and compulsion also in the case of inanimate things; for we say both that a stone spatially moves upward and the fire does so downward by force and compulsion. But when these spatially move in accord with nature and in accord with their
20 intrinsic impulse, this is not by force, but neither are they said to do so voluntarily, but rather the opposite condition is nameless. But when something moves contrary to this impulse, we say it does so by force.

And as in the case of inanimate things, so in the case of animals we see many things that are by force, both ones undergone and ones done, whenever something
25 moves them from without contrary to their internal impulse. In inanimate things the starting-point is simple, but in animate ones it is multiple; for desire and reason are not always in harmony. So, while in the case of other animals what is forced is simple, as it is in the case of inanimate things (for they do not have reason and desire that is contrary to it, but live by desire [alone]), in the human being, by contrast, both are present at a certain age, the one when we also attribute action to them. For we do not
30 say that a child does actions, or a wild beast either, but someone who is already doing things because of rational calculation.

It seems that everything forced is painful, and no one who does something by force enjoys doing it. That is why the most dispute arises about the self-controlled person and the one who lacks self-control. For each acts having impulses contrary to

35. 1223b27–36.
36. 1223a24–27.

himself, so that it is by force, they say, that the self-controlled person drags himself away from his appetites for pleasures (for dragging oneself away in the face of an opposing desire is painful), and it is also by force that the one who lacks self-control acts contrary to rational calculation. And he seems less pained (for appetite is for the pleasant and he enjoys following it). So the person who lacks self-control is more voluntary and not forced because he acts without pain. On the other hand, persuasion is opposed to force and compulsion. And the self-controlled person is driven toward **$1224^{b}1$** the things he is persuaded of, and proceeds not by force but voluntarily. Appetite, by contrast, drives without persuading; for it does not share in reason.

It has been stated, then, that these people alone seem to do actions due to force and voluntarily, and this is due to a certain cause, that there is a certain similarity to the force that we say applies also to inanimate things. Nonetheless, if one adds what was added to the definition in that case, the issue is resolved. For whenever something external moves something or causes it to rest contrary to the impulse internal to it, we say that it does so by force, and whenever it is not, not by force. In the person who lacks self-control and in the self-controlled one, it is the intrinsic impulse present in him that drives him (for they have both impulses), so that neither acts by force, but rather, because of these impulses, at any rate, voluntarily and not under compulsion. For a starting-point that is external and that is impeding or moving something contrary to its impulse, we say, is one that compels, as if someone, having grasped the hand of a person, were to strike another with it, in opposition both to what its owner wished and appetitively desired. But when the starting-point is internal, it is not by force.

Further, both pleasure and pain are present in both cases. For the one acting with self-control is immediately pained when he is acting contrary to appetite, but enjoys the pleasure of expecting that he will be benefited later, or even of being immediately benefited by acting in a healthy way; and the one who lacks self-control, though he enjoys getting what he appetitively desires by acting without self-control, is pained by the expectation of pain, since he thinks that he is doing a bad thing. So there is some reason to say that each acts due to force, and that, whether because of desire or because of rational calculation, each sometimes acts involuntarily; for the two elements, each being separate, get knocked out by each other. Hence people transfer it to the whole soul, when they see something of this sort in its parts. In the case of the parts it is possible to say this, but the whole soul, both of the person who lacks self-control and of the self-controlled one, does actions voluntarily. Neither of these people does anything by force, though an element in them does, given the fact that by nature we have both elements.

For indeed reason is among the things that are by nature starting-points—further it will be present if one's development is left to proceed and is not deformed—as also is appetite, in that it is present from the outset following birth. And it is pretty much by these two things that we define what is by nature: whatever is in everyone from the outset following birth; and whatever comes about for us when our development

is left to proceed normally—for example, gray hair, old age, and other things of this sort. So that each of the two people acts not in accord with nature [in a way], though unconditionally each acts in accord with nature, although not the same nature.

These, then, are the puzzles about the self-controlled person and the one who lacks self-control, about whether both act by force, or one or the other does, so that either it is not voluntary, or done by force and voluntary at the same time, and—if what is by force is involuntary—voluntary and involuntary at the same time. And it is pretty much clear to us from what has been said how one must reply.

There is another way, however, in which people are said to act by force and under compulsion, without any discord between reason and desire, when they do an action they suppose is both painful and base, yet if they do not do it, beating, imprisonment, or death would follow. For they did these actions, they say, by being compelled. Or is that not so, but rather everyone does the thing itself voluntarily? For it is possible not to do them, but rather to endure the relevant suffering.

Further, perhaps one might say that some of these are voluntary, others not. For whichever ones are of the sort whose non-existence or existence is up to oneself, all those one does not wishing to, one does voluntarily, and not by force. But whichever ones are of the sort where this is not up to oneself, one does by force in a way, but not, of course, unconditionally, because one does not deliberately choose the thing itself that one does, but rather what it is for the sake of, since in these cases too there is a certain difference. For if someone killed in order to prevent someone from catching hold of him, he would be ridiculous if he said that he did so by being forced and under compulsion. Instead, what he will suffer for not having done the action must be a greater evil and more painful. For in this way he will be acting under compulsion, and not by force, or not by nature, whenever he does evil for the sake of good or the deliverance from a greater evil, and he will, at any rate, be acting involuntarily; for these things are not up to himself.

That is why many people assume that even love is involuntary, as well as certain cases of anger and natural conditions, on the grounds that they are too strong for one's nature. And we have sympathetic consideration, on the supposition that these naturally force one's nature. And one would seem to be acting more by force and involuntarily in order to avoid being strongly pained, or rather not mildly, and, in general, in order to not be pained or in order to not be pleased. For what is up to oneself (and the whole issue is referred back to this) is what one's nature is able to bear. And what it is not able to bear, and is not by nature [within the scope] of one's desire or rational calculation, is not up to oneself. That is also why we do not say in the case of those who are inspired and make prophecies, even though they produce a work of thought, that nonetheless their saying the things they said, or doing the things they did, is up to them. But surely neither is it due to appetite. So, in fact, even certain thoughts and certain feelings, or the actions that are in accord with thoughts and rational calculations of these sorts, are not up to us, but rather, as Philolaus said,[37] some arguments are stronger than us.

37. B16 DK.

So, on the supposition that the voluntary and the involuntary and their relation to what is by force needed investigation, let this be determined in this way; for the things people say that most impede [our understanding of] the voluntary are to the effect that we have acted by force but not voluntarily.

2.9
Voluntary and Involuntary (2)

Since this discussion has now concluded, and the voluntary has been defined neither by desire nor by deliberate choice, it surely remains to define what being in accord **1225^{b}1** with thought is. The voluntary seems to be the contrary of the involuntary, and that knowing to whom, with what, or for the sake of what [one is doing something]—for sometimes, though one knows that this is one's father, one is not trying to kill him, but to save him, as happened with the daughters of Pelias;[38] or one knows that what one is doing something with is a drink, but thinks it is a love-potion and wine, when it is really hemlock—is the contrary of being ignorant of to whom one is doing something, with what one is doing it, and what, due to ignorance and not coincidentally, one is doing. And what is due to ignorance of what, with what, or to whom is involuntary; the contrary, therefore, is voluntary. Whatever, then, is up to oneself not to do that one does not in ignorance and due to oneself is necessarily voluntary, and this is the voluntary. On the other hand, whatever one does in ignorance and due to ignorance is involuntary.

But since scientifically knowing (indeed, knowing) is twofold, one consisting in possessing, the other in using scientific knowledge, the person who possesses it but does not use it would in a way rightly be said to be ignorant, and in a way not rightly—for example, if he failed to use it due to negligence. Similarly, someone who did not possess it would be blamed if it was something easy or necessary [to know], which he failed to possess due to negligence, pleasure, or pain. So these things must be added to the definition.

As regards the voluntary and the involuntary, then, let them be distinguished in this way.

2.10
Deliberate Choice

After this, let us talk about deliberate choice, first going through some puzzles concerning the account of it. For one might be in doubt about what kind it naturally

38. Pelias was the legendary king of Iolcus. Medea wanted her husband Jason to have his throne. So she led his daughters (the Peliades) to believe that chopping him up and boiling him with herbs would restore his youth. Instead, it killed him.

belongs to and where to put it, and whether the voluntary is or is not the same as the deliberately chosen. Certain people state, indeed, and it might seem so upon inquiry, that deliberate choice is most of all one of two things, either belief or desire; for both manifestly follow along with it.

That it is not desire is evident; for then it would be wish, appetite, or spirit, for no one desires anything without being affected by one of these. But then spirit and appetite are present even in wild beasts, while deliberate choice is not. Further, even in the case of those in whom both these things are present, many deliberate choices are made without spirit or appetite. And those in the grip of feelings are not deliberately choosing, but instead are being resilient. Further, appetite and spirit always involve pain, while many things are deliberately chosen in the absence of pain. But then wish and deliberate choice are not the same either. For people wish for some things knowing them to be impossible (for example, to both rule as king of all human beings and to be immortal), while no one, unless ignorant of the fact, deliberately chooses what is impossible, nor, in general, does anyone deliberately choose what is possible, if he does not think it is up to him to do or not to do it. So surely this is evident, that it is necessary for what one can deliberately choose to be something that is up to oneself.

Similarly, it is clear that deliberate choice is not belief either, or something that one simply thinks. For what one can deliberately choose, we saw, is something that is up to oneself, while we believe many things that are not up to ourselves—for example, that the diagonal is commensurable. Further, deliberate choice is not true or false. Neither, then, is it a belief about the things that are up to us to do in action, in virtue of which we end up thinking that we should do or not do one of them.

The following point jointly concerns belief and wish; for no one deliberately chooses an end, but what furthers the end. I mean, for example, that no one deliberately chooses to be healthy, but to walk around or sit down for the sake of being healthy, nor to be happy, but to make money or take a risk for the sake of being happy. And, in general, a person who is deliberately choosing is clearly always both deliberately choosing something and for the sake of something, the latter being something for the sake of which something else is deliberately chosen, while the former is what is deliberately chosen for the sake of something else. The end, by contrast, is what is above all wished for, and one believes that one should be healthy and do well in action. So it is evident due to these considerations that deliberate choice is something other than belief or wish; for wishing and belief are above all about the end, while deliberate choice is not.

That deliberate choice is not wish, belief, or simple supposition is clear. But how does it differ from these, and how is it related to the voluntary? It will then at the same time be clear what deliberate choice is. Among the things that are capable of being or of not being, some are such that it is possible to deliberate about them. But about some it is not possible. For some are capable of being or of not being, but their coming to be is not up to us, but rather some come to be due to nature, others due to other causes, and no one would attempt to deliberate about these unless in ignorance.

The things, however, that not only can be or not be, but that human beings can also deliberate about, are those that it is up to us to do or not to do.

That is why we do not deliberate about things in India, or about how to square the circle (for the former are not up to us, and the latter is not at all doable in action). But neither do we deliberate about all the things doable in action that are up to us (and this too makes it clear that deliberate choice is not simply belief). But the things that can be deliberately chosen and done in action are among the ones that are up to us. That is also why one might raise a puzzle as to why exactly doctors deliberate about things they have scientific knowledge of, while orthographers do not. The cause is that error arises in two ways (for we can err in rational calculation or in perception when actually doing the thing). But while in medicine it is possible to err in both ways, in orthography it is possible to do so [only] in perception and action, and if they start to investigate that, it will go on without limit. **1226^{b}1**

Deliberate choice, then, is neither belief nor wish, whether one of the two or both together (for no one deliberately chooses all of a sudden, but it does seem that acting and wishing can be sudden). Therefore, it is based on both; for both are present in one who deliberately chooses.

But how it is based on them must be investigated. In a way, however, even the name itself makes this clear; for deliberate choice (*prohairesis*) is choice (*hairesis*), not unconditionally so, but of one thing before (*pro*) another, and this is not possible without investigation and deliberation. That is why deliberate choice is based on deliberative belief.

About the end no one deliberates—instead, this is assumed by everyone—but about the things that lead to it, whether this or that conduces to it, or else, when one has a belief about that, how it will come about. And we all deliberate about this until we carry back the starting-point of the process of its coming to be to ourselves. If, then, no one deliberately chooses without prior preparation or without prior deliberation, whether for worse or better, and if one deliberates about whatever is up to us of the things that further the end that can either be or not be, it is clear that deliberate choice is a deliberative desire for things that are up to oneself. For we all deliberate about the things we also deliberately choose, although we do not deliberately choose all the things we deliberate about. I mean by a desire's being "deliberative" that deliberation is its starting-point and cause—that is, one desires because of having deliberated.

That is why deliberate choice is not present in other animals, nor in every stage of life, or every condition of human being; for deliberation is not present either, nor supposition about the why of things. But nothing prevents a belief about whether something must be done or not done from being present in many, though not yet due to rational calculation. For the deliberative part of the soul is a part capable of getting a theoretical grasp on a certain cause. For the for-the-sake-of-which is one of the causes; for the why of something is a cause and that for the sake of which something is or comes to be, this, we say, is a cause—for example, the conveyance of things is

a cause of walking, if one walks for the sake of this. That is why those who have not assumed a target are not in a position to deliberate.

So, if a person due to himself and not due to ignorance does or refrains from doing what it is up to him to do or not to do, he does it or refrains from doing it voluntarily. But we do many actions of this sort without prior deliberation or premeditation. So it necessarily follows that everything deliberately chosen is voluntary, but not everything voluntary is deliberately chosen, and that everything that is in accord with deliberate choice is voluntary, but not everything voluntary is in accord with deliberate choice.

At the same time it is evident from these considerations that legislators are correct to distinguish some happenings as voluntary, some as involuntary, some as premeditated; for even if they are not portraying things exactly, they at least touch on the truth to some extent. But we will speak about this in our investigation concerning justice.[39] As for deliberate choice, it is clear that it is not simply wish or belief, but belief and desire together, when these come to a conclusion on the basis of deliberation.

But since one who deliberates always deliberates for the sake of something, and for the person who deliberates there is always some target for the furthering of which he investigates what is advantageous, it follows that no one deliberates about the end; instead, it is rather a starting-point and hypothesis, just like hypotheses in the theoretical sciences (these were spoken about briefly at the start of these discussions, and with exactness in the *Analytics*).[40] And everyone's investigation, whether involving craft or not involving craft, bears on what furthers the end—for example, one deliberates about whether one should wage war or not. But beforehand there will indeed be the why, and this is the for-the-sake-of-which—for example, wealth, pleasure, or something else of that sort, which happens to be the for-the-sake-of-which. For the person who deliberates, if he has investigated from the perspective of the end, deliberates about how in that case to bring things back to himself, or what he himself can do to further the end.

The end is by nature always good, and what people deliberate about in particular cases (for example, the doctor might deliberate about whether to administer a drug, and the general about where to set up camp); for them the end, what is unconditionally best, is good. What is contrary to nature, on the other hand, and due to distortion, is not the good, but rather the apparent good.

The cause of this is that, among the things that are, some cannot be used for anything other than what they are naturally for—for example, sight; for it is not possible to see what is not an object of sight, nor to hear what is not an object of hearing. But from a science [it is possible] to produce what it is not the science of; for the same science is not the science of health and of disease in the same way, but of the one in accord with nature, of the other contrary to nature. Similarly, wish is by nature for

39. *NE* 1135b11–1136a9.
40. 1214b6–15, 1222b15–1223a9, *APo*. 1.2.

the good, but contrary to nature for the bad too, and one wishes by nature for the good, but contrary to nature and due to distortion, also for the bad.

But surely the destruction and perversion of a given thing are not to some random thing, but to contraries and intermediates. For it is impossible to go outside these, since deception also brings about not random things but contraries where there are such, and those contraries that are contraries in accord with the relevant science. It is necessary, therefore, that both deception and deliberate choice come about from the mean to contraries (and the more and the less are contraries to the mean). And the cause is the pleasant and the painful; for the situation is that the pleasant appears good to the soul, the more pleasant better, the painful bad, and the more painful worse. So from these considerations too it is clear that virtue and vice are concerned with pleasures and pains. For they are concerned with what can be deliberately chosen, deliberate choice is concerned with what is good and bad and what appears so, and pleasure and pain are by nature things of the latter sort.

Therefore, since virtue of character is itself both a sort of mean and always concerned with pleasures and pains, while vice lies in excess and deficiency and is concerned with the same things as virtue, it is necessary for virtue of character to be a state that deliberately chooses what, in relation to us, is a mean in pleasures and pains, that is, the ones in respect of which, as he enjoys or is pained by them, someone is said to be of a certain sort in regard to character; for the lover of sweet-tasting things or the lover of bitter-tasting ones is not said to be of a certain sort in regard to character.

2.11
Virtues, Eds, and What Furthers Ends

These things having been determined, let us state whether virtue makes deliberate choice incapable of error and the end correct, in such a way that one deliberately chooses for the sake of what one should, or whether, as certain people believe, it makes the reason correct. (But the latter is self-control; for it does not corrupt the reason. But virtue and self-control are distinct. However, these must be spoken about later on,[41] since for those, at least, to whom it seems that virtue supplies the correct reason, the cause is that self-control is this sort of thing; and self-control is one of the praiseworthy things.) But let us say [what our view is] after first raising some puzzles. For it is possible for the target to be correct, but to make errors in what furthers hitting the target; on the other hand, it is possible to be in error about the target, but to be correct about what will allow us to reach it; and it is possible for neither to be correct. Does virtue make the target correct, or what furthers hitting the target? We

41. *NE* $1150^{b}29–1151^{a}28$.

assume, of course, that it is the target, because there is neither rational calculation nor reason concerning this. Let this, then, be assumed as a starting-point.

For the doctor does not investigate whether someone should be healthy or not, but whether he should walk around or not, nor does the physical trainer look into whether someone should be in good condition or not, but whether he should engage in wrestling or not. Similarly, no other craft is concerned with the end; for just as the hypotheses are starting-points in the theoretical sciences, so too in the productive ones the end is starting-point and hypothesis. Since this is what being healthy is, it is necessary for this to be present, and for it to be present, that must be, just as in the other sphere, if a triangle is two right angles, it is necessary for this to be so. Of understanding, then, it is the end that is starting-point, but of action it is the end result of understanding.

If, then, the cause of all correctness is either reason, or if not reason, virtue, then the correctness of the end, but not of what furthers the end, would be due to virtue. And the end is the for-the-sake-of-which. For all deliberate choice is of something and for the sake of something. But the mean is a for-the-sake-of-something, of which virtue is cause, [namely, of] the deliberately choosing being for the sake of it. However, the deliberate choice is not of it, but of the things that are for its sake. Therefore, hitting on these things, whichever ones one must do for the sake of the
1228a1 end, is a task for a different capacity. But of the deliberate choice's end being correct virtue is cause. And that is why it is on the basis of his deliberate choice that we judge what sort of person someone is, that is, we judge what he acts for the sake of, not what he does.

Similarly, vice makes the deliberate choice be for the sake of the contrary things. If this person, then, when it is up to him to do noble things and abstain from doing shameful ones, does the contrary, it is clear that this person is not excellent. So it is necessary for vice to be voluntary as well as virtue; for there is no necessity to do the depraved things. That is also why vice is blameworthy and virtue praiseworthy; for one is not blamed for shameful and bad actions that are involuntary, nor is one praised for good involuntary ones, but rather for voluntary ones.

Further, we praise and blame everyone looking more toward their deliberate choice than toward their works, because people do base things under compulsion too, but no one deliberately chooses under compulsion; and yet the activity [of virtue] is more choiceworthy than virtue.

Further, because it is not easy to see what sort a deliberate choice is, we are compelled to judge on the basis of his works what sort of person someone is. So the activity is more choiceworthy, but the deliberate choice is more praiseworthy. These things follow from what has been assumed, and further, agree with the things that appear to be so.

BOOK 3

3.1
Courage

That means are present in the virtues, then, that they are deliberately choosing states, that their contraries are vices, and what these means are has been stated in universal terms. Now let us take them individually and speak of them in order.

And first let us speak about courage. It certainly seems to pretty much everyone both that the courageous person is concerned with fears and that courage is one of the virtues. And in our previous catalog[42] we distinguished rashness and fear as contraries; for these are in a way opposite to each other. It is clear, then, that those said to be what they are in accord with these states will be similarly opposed to each other—for example, the coward (for he is said to be such in virtue of being more afraid than one should and less confident than one should) and the rash person (for he too is said to be what he is in accord with being such as to be less afraid than one should and more confident than one should). That is also why he is named such paronymously; for the rash person is said to be such paronymously from rashness.

So, since courage is the best state concerned with feelings of fear and confidence, one should be neither like rash people (for they are deficient in the former and excessive in the latter) nor like cowards (for they too do the same, except not concerning the same things, but instead [act] from contrary ones, since they are deficiently confident and excessively afraid), it is clear that the mean disposition between rashness and cowardice is courage; for this is best.

The courageous person seems to be for the most part fearless, the coward fearful, and the latter seems to fear things, whether many or few, great or small, and to do so intensely and quickly, while his contrary either does not fear at all or does so slightly, slowly, and infrequently, and [only] great things. And the latter endures what is intensely frightening, the former not even what is slightly so.

What sorts of things, then, does the courageous person endure? First, is it what is frightening to himself or what is frightening to others? If, of course, it is what is frightening to another, one would say that there is nothing dignified in that. If it is what is frightening to himself, what is frightening to him would be great and numerous frightening things. But frightening things produce fear in each individual to whom they are frightening—for example, if they are intensely frightening, the fear is strong; if they are slightly so, it is weak. So the result is that the courageous person feels fears that are great and numerous, while it seemed on the contrary that courage renders one fearless, and this consists in fearing little or nothing, and those slightly or scarcely at all.

42. $1221^{a}17–19$.

But presumably things are said to be frightening, as they are said to be pleasant and good, in two ways. For some are unconditionally so, while others are so to a particular person, though not unconditionally pleasant or good, but on the contrary base and not pleasant, like the things that are beneficial to wicked people, or the ones that are pleasant to children insofar as they are children. It is the same way with frightening things, some are unconditionally so, others so to a particular person. Of the ones, then, that are frightening to the coward insofar as he is a coward, some are frightening to no one [else], while others are slightly so. But the things that are frightening to most people, and to human nature, these, we say, are unconditionally frightening. And the courageous person is fearless in relation to them, and endures frightening things of this sort, which are frightening to him in one way, and in another way not. Insofar as he is human, they are frightening; but insofar as he is courageous, they are slightly frightening, or not at all so.

However, these things are frightening; for they are frightening to most people. That is also why the state [of courage] is praised; for it is just like the case of the strong and the healthy. For these too are of the sort they are, not because no labor can wear out the one, no excess the other, but because they are affected, either not at all or [only] slightly, by what would affect ordinary people, that is, most people. Sickly people, weak people, and cowards, however, are somewhat affected also by affections that are common, except both more quickly and more so than ordinary people, and further, are affected, either not at all or [only] slightly, by what does affect ordinary people.

A puzzle arises, however, as to whether nothing is frightening to the courageous person, and whether he would never become afraid. Or does nothing prevent him from doing so in the way mentioned? For courage is a following of reason, and reason orders us to choose what is noble. That is why the person who, not due to this, endures frightening things, is either out of his senses or rash. But only the one who does so due to what is noble is fearless and courageous. The coward, then, is afraid even of what one should not fear, while the rash person is confident even about what one should not be confident about. The courageous person, by contrast, is as one should be, and in this respect is a mean; for the things reason orders, these are the ones he is both confident about and fears. But reason does not order him to endure what is greatly painful or destructive, unless it is noble to do so. The rash person, then, is confident about such things, even if reason does not order it; the coward, not even if it does order it; the courageous person alone, if it does order it.

There are five forms of courage that are so called by resemblance; for people endure the same things [as courageous people], but not due to the same causes. One is political courage, which is the courage due to a sense of shame. A second is military courage, which is due to experience and knowledge. Not, as Socrates said, knowledge of what is to be feared, but of what can help with what is to be feared. A third is the one due to lack of experience and ignorance, due to which children and mad people endure whatever comes along, and others handle snakes. Another is the courage in

accord with hope, in virtue of which both people who have often been lucky and those who are drunk endure dangers; for wine makes people optimistic. Another is due to a non-rational feeling (for example, due to love or spirit); for in fact a person in love is rash rather than cowardly and endures many dangers, like the man who killed the tyrant in Metapontum,[43] or the legendary one in Crete.[44] And when due to anger and spirit it is the same way; for spirit can drive one out of one's senses. That is why wild pigs seem courageous, without really being so; for when they are out of their senses, they behave like courageous people, and when they are not, they are capricious, like rash people. Nonetheless, the courage of spirit is the most natural; for spirit is unconquerable, which is also why the young are the best fighters. Political courage, on the other hand, is due to law. None of these, however, is truly courage, although as sources of encouragement for those in danger they are all useful.

Frightening things we have so far spoken about in general terms, but it is better to determine them more fully. In general, then, it is the things productive of fear that are said to be frightening. And such things as appear to be productive of pain that is destructive are of this sort; for those who await some other sort of pain, though they might perhaps have a feeling of pain produced in them, it will not be fear—for example, if someone foresees that he will be pained by the sort of pain that envious people are pained by, or the sort that jealous ones are, or those that feel ashamed. Fear, on the other hand, is produced only in the case of such pains as apparently will come about, the nature of which is to be destructive of life. That is also why some people who are very soft about some things are courageous, while some who are hard and resilient are cowards. **$1229^{b}1$**

Indeed, it seems to be pretty much special to courage that one be disposed in a certain way at the moment of death and the pain of it. For if one person were capable of enduring, as reason [prescribed], in the face of heat and cold and pains of this sort, which are lacking in danger, but was soft and greatly afraid in the face of death, not due to some other affection but due to its very destructiveness, while another was soft in the face of those things but unaffected in the face of death, the first would seem cowardly, the latter courageous. For in fact only those sorts of frightening things are said to be dangerous as bring close to us what is productive of destruction, and danger appears whenever they appear close.

The frightening things, then, concerning which we call a person "courageous," as was said, are those that appear to be productive of pain that is destructive—provided that these appear close rather than distant, and are, or appear to be, of such magnitude as is proportional to a human being; for there are some things that necessarily appear frightening to any human being and throw him into confusion. For just as some degrees of heat and cold, and certain other capacities, are too much for us and

43. The reference may be to Antileon of Metapontum, who assassinated Archelaus tyrant of Heraclea to rescue his boyfriend Hipparinus from the latter (Plutarch, *Moralia* 760c).
44. The reference is uncertain, but may be to Theseus, who was helped by his lover Ariadne to slay the Minotaur.

for the states of the human body, so there is nothing to prevent it being this way too as regards the feelings of the soul.

Certainly cowards and rash people are deceived due to their states; for to the coward both what is not frightening seems frightening and what is slightly frightening seems intensely so; to the rash person it is the contrary, what is frightening seems not to trouble his confidence, and what is intensely frightening seems only slightly so, while to the courageous person things most of all seem as they truly are. That is why someone is not courageous if he endures frightening things due to ignorance (for example, if someone endures showers of thunderbolts due to madness), nor, knowing the danger, if he does so due to spirit (for example, the Celts take up weapons and confront the waves, and barbarian courage in general involves spirit).

But some people endure [frightening things] due to other pleasures too. For even spirit includes a certain pleasure; for it involves the hope of revenge. Nonetheless, no one who endures [the danger of] death due to this or due to some other pleasure, or due to the avoidance of greater pain, could justly be said to be courageous on these grounds. For if dying were pleasant, intemperate people would often have died due to their lack of self-control, in just the way that, as things stand, though dying itself is not actually pleasant, there are things productive of it that are, and many knowingly do embrace it due to their lack of self-control, and not one of these would seem to be courageous, even if they were entirely ready to die. Nor is someone courageous if he dies to avoid suffering (which is precisely what many people do). As Agathon says:

> For the base ones among mortals when defeated by suffering
> Fall in love with dying.[45]

So too the poets tell the story of Chiron who, due to the pain of his wound,[46] prayed for death, though he was immortal.

In much the same way, those who endure dangers due to experience, which is pretty much the way that most people in the army endure them, are not courageous. For the contrary holds of what Socrates thought, when he thought that courage is scientific knowledge. For it is not because they know what is frightening that those with the scientific knowledge of how to climb up the masts are confident, but because they know how to help with what is to be feared. Nor is that courage due to which people fight more confidently; for then, according to Theognis, even strength and wealth would be courage: "For every man is conquered by poverty."[47] But manifestly there are some cowards who nonetheless endure danger due to their experience. And this is because they do not think it is a danger; for they know how to help with it. A sign of this is that when they think they do not have help available, but already what is to be feared is close, they do not endure it.

45. Fr. 7 Nauck.
46. Received from one of Heracles' poisoned arrows.
47. Ln. 177 Diehl.

But in the case of all these sorts of causes, the people who endure dangers due to shame are the ones who would appear most courageous, as Homer says of Hector enduring danger when facing Achilles: "And shame took hold of Hector," and "Polydamas will be the first to reproach me."[48] And this is political courage.

True courage, however, is neither this nor any of those others, but it is similar to them, as also is the courage of wild beasts, who, due to their spirit, rush to meet the blow. For one should stand one's ground when afraid not because one will incur disrepute, or due to anger, or due to not thinking one will be killed, or due to having the capacity to protect oneself (for this way one will not think there is anything at all to be afraid of).

But since every virtue is a deliberately choosing [state] (in what way we mean this was stated previously:[49] it makes us choose everything for the sake of something, and this is the for-the-sake-of-which, the noble), it is clear that courage too, because it is a virtue, will make one endure what is frightening for the sake of something, so that one does so neither due to ignorance (for virtue rather makes us judge correctly) nor due to pleasure, but because it is noble—since, if it is not noble to do so, at any rate, but mad, one does not endure it (for it is shameful to do so).

Concerning what sorts of things, then, courage is a mean, between what, and why, and what the capacity of frightening things is, has now, in accord with our present methodical inquiry, been pretty much adequately stated.

3.2
Temperance and Intemperance

We must next try to make some determinations about temperance and intemperance. The intemperate person is said to be such in many ways. For the one who has not yet been disciplined or treated is intemperate, just as a thing that has not been divided is undivided, and is either capable or incapable of being divided (for both what cannot be divided, and what can be but has not been, are undivided). And it is the same way with intemperate as well. For there is both what is not naturally receptive of discipline and what is naturally receptive of it but has not been disciplined for errors in areas in which the temperate person acts correctly (as in the case of children); for people are said to be intemperate with reference to this sort of intemperance. Furthermore, in yet another way, those who are difficult to cure or altogether incurable by discipline [are said to be so].

But though something is said to be intemperance in several ways, it is evident that the intemperate people are [all] concerned with certain pleasures and pains, and that it is in how they are disposed to these that they differ from each other and from other

48. *Iliad* 22.100. The first quotation is not in our text, but at 22.105 Hector says, "I feel shame before Trojans and the Trojan women."
49. $1227^{b}5–11$, $1227^{b}34–1228^{a}4$.

people. (We previously described[50] how we transfer the name "intemperance.") Those people who, due to insensibility, are unmoved by the same pleasures, some people call "insensible," and others call by other such names. But the affection is not at all known or commonplace, because everyone errs more in the opposite direction and because a yielding to and a perception of such pleasures is inborn in everyone. The people who are most of all of this insensible sort are the boorish ones that the comic playwrights introduce, the ones who stay clear even of moderate and necessary pleasures.

But since the temperate person is concerned with pleasures, it is necessary for him also to be concerned with certain appetites. We need, then, to grasp what these are. For the temperate person is not temperate in regard to every appetite nor to all that is pleasant but, as it seems, to two of the perceptible ones, both the objects of taste and of touch, but in truth, the object of touch; for the temperate person is not concerned with the pleasure that is due to the sight (without sexual appetite) of beautiful things, nor with the pain of ugly ones, nor with the [pleasure or pain] due to hearing what is harmonious or disharmonious, nor yet with those of smelling good or bad odors; for no one is said to be intemperate for feeling or not feeling these. At any rate, if someone looks at a beautiful statue, or horse, or human being, or listens to someone singing, not wishing to eat, or drink, or have sexual intercourse, but just to look at beautiful things or listen to people singing, he would not be thought to be intemperate, any more than those beguiled by the Sirens would.[51]

Instead, temperance is concerned with the only two sorts of perceptible objects that the various wild beasts also have perception of, and are pleased or pained by—the objects of taste and the objects of touch. But all wild beasts appear to be pretty much equally lacking in perception of the pleasures of the other perceptible objects—for example, of harmonious sound or visual beauty. For it is evident that they are not affected to any extent worth talking about by the mere looking at beautiful things or listening to harmonious sounds, unless perhaps some extraordinary case has occurred.

But neither are they affected by good or bad odors, and yet their perceptual modalities, at any rate, are all very acute. On the contrary, even in the case of odors the ones they enjoy are the ones that coincidentally, but not intrinsically, gladden them. By "non-intrinsic" I mean the odors we enjoy in anticipation or remembrance of, for example, gourmet food and drink (for the pleasure due to which we enjoy these, the pleasure of eating and drinking, is a distinct one); the intrinsic ones are, for example, those of flowers. That is why Stratonicus put it elegantly when he said that the latter smell beautiful, the former delicious. So even in the case of the pleasures of taste, wild beasts are not excited by all of them, and not by those whose perception is with the tip of the tongue, but rather only by those whose perception is with the gullet, which is a feeling more like touch than taste. That is why gourmands pray not for a long tongue, but for the gullet of a crane—as did Philoxenus, the son of Eryxis.

50. Reference is unclear.
51. Homer, *Odyssey* 12.165–200.

So, unconditionally speaking, one should assume that intemperance is concerned with the objects of touch. And indeed the intemperate person is likewise concerned with such things. For drunkenness, gluttony, gourmandizing, lechery, and everything of this sort have to do with the perceptual modalities mentioned, and these are precisely the parts into which intemperance is divided. But no one is said to be intemperate if he is excessive concerning the pleasures of sight, hearing, or smell; instead, we criticize these errors, but without serious reproach. And, in general, concerning those things where we do not speak of the self-controlled, or those who lack self-control, neither [do we speak] of intemperate or temperate ones.

A person is insensible (or in whatever way he should be named), then, who is so disposed that he is deficient in the enjoyment of the things that for the most part all necessarily share in and enjoy; while the one who is excessive is intemperate. For everyone by nature both enjoys these things and acquires an appetite for them, without being, or being called, either intemperate (for they are neither excessive by enjoying them more than they should when they get them nor by being more pained than they should when they do not get them) or insensible (for they are not deficient in their enjoyment or being pained, but lean more to being excessive).

But since there is excess and deficiency concerning these things, it is clear that there is also a mean, and this state is the best and contrary to both of them. So if temperance is the best state concerned with the things the intemperate person is concerned with, the mean concerned with the perceptible pleasures mentioned would be temperance, it being a mean between intemperance and insensibility. But the excess would be intemperance, while the deficiency is either nameless or called by the names mentioned. We will have to make more exact determinations about the relevant kind of pleasures in our later discussions concerning self-control and lack of self-control.[52]

1231b1

3.3
Mild-Manneredness and Harshness

Both mild-manneredness and harshness must be grasped in the same way; for we see in fact that the mild-mannered person is concerned with the pain that is due to spirit by being disposed to it in a certain way. And we cataloged[53] and opposed to the irascible, harsh, and savage one (for all of these sorts of things belong to the same disposition) the slavish and the foolish person. For these are pretty much the things people call those who fail to move their spirit even against those they should, but are tolerant of insulting treatment and humble in the face of contempt. For in the case of this pain that we call "spirit," slowness is the opposite of quickness, intense of slight, and being pained for a short time of being so for a long time. But

52. *EE* 6.4 (= *NE* 7.4).
53. 1220b38, 1221a15–17, 1221b12–15 (the terms used are somewhat different).

since, as we have said there is in other cases, there is excess and deficiency here too (for the harsh person is the sort that is affected more quickly, to a greater degree, for a longer time than one should, when one should not, against the sorts of people one should not, and against too many people, while the slavish person is the contrary), it is clear that there is also someone who is the mean in this inequality. Since, then, both of these other states are in error, it is evident that the mean state between these is the decent one; for it is neither too early nor too late, neither getting angry with those one should not, nor failing to get angry with those one should. So, since in fact mild-manneredness is the best state concerned with these affections, mild-manneredness too would be a certain mean, and the mild-mannered person a mean between the harsh and the slavish ones.

3.4
Generosity

Greatness of soul, magnificence, and generosity are also means. Generosity, for its part, is concerned with the acquisition and expenditure of wealth. For the person who is pleased by every acquisition more than one should, and is pained by every expenditure more than one should, is ungenerous; the one who in both cases is so less than one should is wasteful; while the one who in both is so as one should is generous. (By "as one should," both in these cases and in others, I mean "as correct reason prescribes.") But since the first two people are in excess and deficiency, respectively, and where there are extremes there is also a mean, and this is best (the best where each form is concerned being one thing), it is necessary for generosity also to be a mean between wastefulness and ungenerosity, concerning the acquisition and expenditure of wealth.

But we speak of wealth and the craft of wealth acquisition in two ways; for there is the intrinsic use of a possession, such as of a shoe or a cloak, and the coincidental use of it—not of course as when someone uses a shoe as a weight, but as, for example, selling it or hiring it out (for then it is used as a shoe). The avaricious person is the one who is eager for money, and money is concerned with acquisition rather than coincidental use. The ungenerous person, by contrast, could even be wasteful concerning the coincidental way of acquiring wealth; for it is in the case of acquiring wealth in accord with nature that he pursues increase. The wasteful person is deficient in the necessities, while the generous one gives away any surplus.

There are also forms of these states that exhibit differences that are described in terms of the more and less concerning their parts. For example, a miser, a skinflint, and a profiteer are ungenerous—the miser in not giving away money, the profiteer in accepting it from any source, and the skinflint in his intense worry about small sums. The person who is unjust in accord with ungenerosity is a keeper of false accounts and a fraud. And, similarly, one sort of wasteful person is a glutton for undisciplined

expenditure, while another keeps no accounts because he cannot endure the pain of keeping accounts.

3.5
Greatness of Soul

As regards greatness of soul, one must determine what is special to it on the basis of the qualities ascribed to great-souled people. For just as in other cases too, where due to their closeness and similarity up to a point their further divergence escapes notice, the same also happens concerning greatness of soul. That is why the contrary people sometimes lay claim to the same quality, the wasteful and the generous, the surly and the dignified, and the rash and the courageous; for they are concerned with the same things and up to a certain point are close neighbors—just as the courageous person and the rash one are capable of enduring dangers, but the former in one way, the latter in another, and these differ greatly.

We speak of the great-souled person, in accord with meriting the title conveyed by the name, as consisting precisely in a certain magnitude of soul and capacity, so that he also seems similar to the dignified person and the magnificent one. Further, greatness of soul also appears to follow along with all the virtues. For correctly judging what is great and small among good things is also something praiseworthy. Those that seem greatest are the ones pursued by the person who possesses the best state concerned with things of this sort. And greatness of soul is the best state. But the virtue concerned with a given thing judges the greater and smaller correctly, in the very way that the wise person and virtue would order. So all the virtues will follow along with greatness of soul, or it will follow along with all of them.

Further, it seems to be characteristic of a great-souled person to tend to despise things. But each virtue makes [its possessor] tend to despise great things that are contrary to reason—for example, courage does this in the case of dangers (for it thinks[54] **1232b1** that a [certain] great danger is among the shameful things, that is, that magnitude is not always to be regarded with fear), a temperate person thinks this about many great pleasures, and a generous one about many great sorts of wealth. And this seems characteristic of the great-souled person, because he is serious about few things, and these great ones, and not because they seem so to someone else. Indeed, the great-souled man would be more concerned about what seems good to one excellent person than about what seems so to many random people, as Antiphon, after his condemnation, said to Agathon who had praised his defense speech.[55] Actually, despising things seems to be above all a special affection of the great-souled person. Again, he seems to give little thought to honor, living, wealth, and the other things that human beings

54. Reading οἴεται.

55. When he was put on trial by the restored democracy for his part in the revolution of the Four Hundred in 411 BC.

take seriously, except to honor. It would pain him to be dishonored and ruled by an unworthy person, and he enjoys getting honor most of all.

He would seem, then, to be disposed in contrary ways; for to be not only most of all concerned with honor, but also to tend to despise popular reputation, seem not to go together. But in saying this we need to draw some distinctions. For honor is great or small in two ways. For it makes a difference whether the honor comes from many random people or from those worthy of note. And, again, so does that for which the honor [is conferred]. For it is great not due to the number or quality of the honorers alone, but also due to its being [conferred for something] estimable. In truth, even positions of rule and the other good things are estimable and worth taking seriously only if they are truly great, so that there is also no virtue without greatness. That is why, as we said,[56] each of the virtues seems to make people great-souled with regard to that with which each of them is concerned.

Nonetheless, beyond the other virtues, there is a particular one that is greatness of soul, so that it must be stated that the person having this one is actually in the special sense great-souled. But since some good things are estimable, while others are not, and of these sorts of goods some are truly great, others small, and of the former some people are worthy, and think themselves worthy, it is among them that the great-souled person is to be sought.

It is necessary, however, to draw a fourfold distinction. For one can be worthy of great things and think oneself worthy of them, plus there are small things and one can be worthy of things of that size and think oneself worthy of them, and there is the reverse in relation to each of these. For one could be such as to be worthy of small things while thinking oneself worthy of great and estimable goods, and one could be worthy of great ones while thinking oneself worthy of small ones. The one who, though worthy of small things, thinks himself worthy of great ones is blameworthy (for he is foolish and it is no noble thing to think oneself worthy of getting what is contrary to one's worth). But that person is also blameworthy who, though worthy of such things, does not think himself worthy to partake in them, even though they
1233a1 are available to him. There remains, then, the person who is contrary to both of these—the one who is worthy of great things and thinks himself worthy of them, and is such as he thinks himself to be. He is praiseworthy and a mean between them.

Since, then, concerning the choice and use of honor and other estimable goods, the best disposition is greatness of soul, and we define the great-souled person as concerned with these, and not as concerned with useful things, and since at the same time too the mean disposition is most praiseworthy, it is clear that greatness of soul would also be a mean disposition. And of its contraries, just as we cataloged them,[57] the one of thinking oneself worthy of great things when one is not worthy of them is conceit (for we say that those sorts of people are conceited who think themselves

56. 1232a39–b4.
57. 1221a10, 31–32.

worthy of great things without really being so), and the one having to do with really being worthy of great things while thinking oneself not worthy of great ones is smallness of soul (for it seems to be characteristic of a small-souled person not to think himself worthy of anything great, although the things due to which he would justly be thought so are available). So it is necessary for greatness of soul too to be a mean between conceit and smallness of soul.

The fourth of the cases we distinguished is neither altogether blameworthy nor is he great-souled, since he is concerned with nothing having greatness; for he is neither worthy nor thinks himself worthy of great things, which is why he is not contrary [to the great-souled person]. And yet it would seem that being worthy of small things and thinking oneself worthy of them is contrary to being worthy of great things and thinking oneself worthy of them. But this person is not contrary [to the great-souled person] nor to be blamed (for he is as reason prescribes). And he is by nature the same as the great-souled person (for both think themselves worthy of the things they are worthy of). Indeed, he might even become great-souled (for he will think himself worthy of what he is worthy of), while a small-souled person, who, when great goods that are in accord with his honor are available, does not think himself worthy of them, what would he have done if he had been worthy [only] of small ones? For either he would have thought himself worthy of great ones and been conceited, or of still smaller ones. That is also why no one would say of someone who was a resident alien that he was small-souled, if he thought himself unworthy to rule, but instead submits to it, but rather he would say it of someone who was a well-born citizen and thought it a great thing to rule.

3.6
Magnificence

The magnificent person too, for his part, is not concerned with any random action or deliberate choice, but with expenditure, unless perhaps we are speaking metaphorically. And without expenditure there is no magnificence; for it is what is appropriate in adornment, and adornment does not come from random expenditures, but is found in exceeding the necessities. The person, then, who in great expenditure is disposed to deliberately choose what is appropriately great and this sort of mean, and is desirous of this sort of pleasure, is magnificent.

The one who is disposed to greater and inappropriate expenditure is nameless. Nonetheless, he has a certain affinity with those whom some people call "tasteless" and "pretentious." For example, if someone who is rich is spending money on the **1233b1** wedding of his beloved,[58] and it seemed to him to be appropriate to make the sort of preparations one would make for a feast of moderate drinkers, he would be niggardly,

58. I.e., the one who used to be his boyfriend.

while one who receives guests of the latter sort in a way appropriate for a wedding feast, if he does it neither for the sake of reputation nor due to resources, would be similar to a pretentious person.

But the one who spends in accord with worth and as reason prescribes is magnificent; for the appropriate [amount] is in accord with worth; for none of the things that are contrary to worth is appropriate. And [the amount] must be appropriate—for what is appropriate is in accord with worth and what is in accord with worth is appropriate—and appropriate both in relation to the thing (for example, what is appropriate for the wedding of a servant is distinct from what is appropriate for that of a beloved), and for the person himself, if indeed he is up to this much or this sort of thing (for example, the embassy that Themistocles conducted to the Olympic Games was not thought appropriate for him, because of his former low status, but rather for Cimon).

But the person who has a random attitude to worth is none of these. And in the case of generosity it is the same way; for a person may be neither generous nor ungenerous.

3.7
Other Good and Bad States of Character

For their parts, pretty much all of the other praiseworthy or blameworthy states concerned with character are also either excesses, deficiencies, or means in feelings—for example, the envious person and the one who rejoices at another's doing badly. For these are named in accord with their states: envy is being pained at those who, in accord with their worth, are doing well; the feeling of the one who rejoices at another's doing badly has no name, but the one who has it reveals it in rejoicing at those who, contrary to their worth, are doing badly. The indignant person (*nemesêtikos*) is a mean between these; what the ancients called "indignation (*nemesis*)" is being pained at those who, contrary to their worth, are doing badly or doing well, while rejoicing at those doing so in accord with their worth. That is why people think that Nemesis is actually a god.

A sense of shame is a mean between shamelessness and bashfulness; for the one who gives thought to no one's opinion is shameless; the one who gives thought to everyone alike is bashful; and the one who gives thought to the opinion of those who appear decent has a sense of shame.

Friendliness is a mean between enmity and flattery; for the one who in every case readily adapts to the appetites of his associates is a flatterer; the one who collides with all of them is churlish; and the one who neither goes along with nor resists every pleasure, but goes along with what appears best, is friendly.

Dignity is a mean between surliness and being ingratiating; for the one who lives with no regard at all to another, but rather tending to despise people, is surly; the

one who has regard to another in all things, or even feels inferior to everyone, is ingratiating; and the one who does this in some cases, but not in others, and to those worthy of it, is dignified.

The truthful and candid person, whom people call "straightforward," is a mean between the self-deprecator and the boaster. For the one who, not out of ignorance, is deceptive about himself for the worse is a self-deprecator; the one who is so for the **$1234^{a}1$** better is a boaster; and the one who represents himself as he is, is truthful, and, as Homer puts it, sagacious.[59] And, in general, one is either a lover of truth or a lover of falsehood.

Wit too is a mean, and the witty person a mean between the boorish and unwitty person and the buffoon. For just as the fussy eater differs from the omnivorous one concerning nourishment in that the former accepts nothing or only a little and does so reluctantly, while the other accepts everything readily, so too the boorish person stands in relation to the unrefined buffoon; for the former accepts nothing funny except reluctantly, while the other accepts everything readily and with pleasure. But one should do neither. Instead, one should accept some things, not others, and in accord with reason. This is the witty person.

And the demonstration is the same; for indeed wit of this sort, and not the one we speak of by transference, is the most decent state; and the mean is praiseworthy, while the extremes are blameworthy. But since wit is of two varieties (for one consists in enjoying a joke, even one directed against oneself, provided it is of this sort (the jibe included), while the other consists in being capable of producing things of this sort, though they are distinct from each other, both are means. For the good judge of one who can produce jibes of the sort that gives him pleasure, even if the joke is on him, will be a mean between the unrefined person and the one who is prim. This defining mark is better than the one saying that the jibe must not be painful to the one who is the butt of it, no matter of what sort he is. Rather, it should please the one in the mean; for he is the one who judges well.

Though all these means are praiseworthy, they are not virtues, nor are their contraries vices; for they are without deliberate choice. All of them are found in classifications of the feelings; for each is a certain feeling. But because they are natural they contribute to the natural virtues; for, as will be said in later discussions,[60] each virtue in a way occurs both by nature and otherwise, that is, as involving practical wisdom. Thus, while envy contributes to injustice (for the actions that stem from it are directed toward another) and indignation to justice, a sense of shame contributes to temperance (which is why people define temperance as being included in this kind); and the truthful and false are respectively wise and foolish.

The mean is more contrary to the extremes than those are to each other, because it **$1234^{b}1$** does not occur with either of them, while the extremes often occur with each other.

59. E.g., *Iliad* 3.203, *Odyssey* 3.52.
60. *NE* $1144^{b}1$–17.

And sometimes the same people are rash cowards, or wasteful in some things and generous in others, and, in general, uneven in a bad way. For when people are uneven in a good way, they become means; for the extremes are in a way present in the mean.

But the contrariety between the extremes and the mean does not seem to be alike for both, but sometimes is with respect to excess, sometimes with respect to deficiency. The causes of this are the two first mentioned, rarity (for example, of those insensible to pleasure), and the fact that the one we tend to err more toward seems more contrary to the mean. But a third is that what is more similar to the mean appears less contrary to it—for example, rashness in relation to courage, wastefulness in relation to generosity.

The other praiseworthy virtues, then, have pretty much been spoken about.

Books 4–6* = Nicomachean Ethics *Books 5–7

BOOK 7

7.1
Friendship

As regards friendship, what it is and what sort of thing it is, who a friend is, whether something is said to be friendship in one way or in many ways (and, if in many ways, in how many), further, how a friend must be treated, and what the just is that is fitted to friendship—these things are no less to be investigated than what is noble and choiceworthy where character traits are concerned. For indeed it seems to be most of all the work of politics to produce friendship—even virtue, people say, is useful because of this (for it is not possible for those treated unjustly by each other to be friends with one another). Further, we all say that the just and the unjust have most of all to do with friends; and it seems that the same person is both a good man and a friend, that friendship is a state of character, and that, if one wishes to make it so that people do not commit injustice to each other, one must make them friends; for true friends do not commit injustice. But then again, if they are just they will not commit injustice. Therefore, justice and friendship are either the same thing or close to it.

In addition to these considerations, we suppose that a friend is one of the greatest goods, and that friendlessness and isolation are most terrible, because our entire life and our voluntary social interactions involve friends; for we spend our days with members
1235a1 of our household, with family members, or with companions. And private acts of justice, the ones that are in relation to friends, are the only ones that are up to us, while those that are in relation to other people are ordained by law and are not up to us.

There are many puzzles about friendship. First, there are the ones raised by those who bring in considerations from outside and speak in too general terms; for to some it seems that like is friend to like. Hence the sayings: "A god ever draws like to like,"[61] and indeed "Birds of a feather flock together," and "Thief knows thief, and wolf knows wolf."

Natural scientists even arrange the whole of nature by taking as a starting-point that like goes to like (which is why Empedocles also said that the dog was sitting on the tile because they were very alike[62]). It is in this way, then, that they speak of what is a friend. But others say that contrary is friend to contrary. For a loved object or an appetitively desired one is a friend to everyone, and the dry has an appetite not for the dry but for the wet. Hence the sayings: "Earth is in love with rain,"[63] "Change in all things is sweet"[64] (and change is change to the contrary). And like is enemy to like. For "potter hates potter,"[65] and animals that are nourished from the same sources are enemies to each other. Certainly these suppositions, then, are at variance to this extent. For some hold that what is like is a friend, and what is contrary an enemy:

> The less is ever enemy to the more
> And starts a day of hate.[66]

Further, even the places of contraries are separated, while friendship seems to bring things together. But others hold that contraries are friends, and Heraclitus[67] criticizes the poet who wrote, "May strife perish from among gods and humans";[68] for there would not be any harmony without high and low, nor animals without female and male, which are contraries.

These, then, are two beliefs about friendship, which are overly universal and this much separated. But there are also others that are even closer and more akin to the things that appear to be so. For it seems to some people that it is not possible for base people to be friends, but only for good ones, while to others it seems absurd for mothers not to love their children (for it is evident that love is present even in wild beasts; at any rate, they choose to die for their children). To other people it seems that only the useful is a friend. A sign of this is that everyone in fact pursues what is useful and throws away what is useless, even if it is their own (as Socrates the elder used to say, when throwing away spit, hair, and nail clippings), that is, we dispose of the parts that are useless, and in the end, the body, when it is dead (for the corpse is useless). On the other hand, those to whom it seems useful preserve it, as in Egypt. **1235b1**

61. Homer, *Odyssey* 17.218.
62. Either alike in color or because the tile was imbued with the dog's odor.
63. Euripides, Fr. 698 Nauck.
64. Euripides, *Orestes* 234.
65. Hesiod, *Works and Days* 25.
66. Euripides, *Phoenician Women* 539–540.
67. A22, B8 DK.
68. Homer, *Iliad* 18.107.

All these views certainly seem in conflict with each other. For indeed like is useless to like, and contrariety is very far removed from likeness, and contrary most useless to contrary (for contrary is destructive of contrary). Further, it seems to some people that it is easy to acquire a friend, while to others it seems a very rare thing to know one, and not possible to do so without bad luck (for everyone wishes to seem to be a friend to those who are doing well). But others think that not even those who stand by us in cases of bad luck are to be trusted, on the supposition that they are deceivers and just pretending, in order that, through associating with the unlucky, they will acquire their friendship when their good luck returns.

7.2
Nature and the Kinds of Friendship

We must get hold of an account, then, that will at the same time give us the best account of the things that seem to be so about these issues and resolve the puzzles and the contrary positions. And this will occur if it is seen that the contrary things are reasonably held; for an account of this sort will be most of all in agreement with the things that appear to be so. And it happens that the contrary positions will stand if what is said is true in one way, but not true in another.

There is also a puzzle as to whether the object of love is the pleasant or the good. For if we love what we have an appetite for (and sexual love is especially like this; for no one is "a lover who does not love forever"[69]), and appetite is for the pleasant, then, in that case, the object of love is the pleasant. On the other hand, if the object of love is what we wish for, it is the good. But the pleasant and the good are distinct.

As regards these issues and others related to them, we must try to draw distinctions, taking the following as a starting-point: the object of desire and of wish is either the good or the apparent good. That is why the pleasant too is an object of desire; for it is an apparent good; for some people believe it is good, while to others it appears good even if they believe it is not; for appearance and belief are not in the same part of the soul. However, that both the good and the pleasant are fitted to friendship is clear.

With this determined, another assumption must be grasped. For some goods are unconditionally good, while others are good for a particular person but not unconditionally good. And the same things are unconditionally good and unconditionally pleasant. For we say that what is good for a healthy body is unconditionally good for a body, while we do not say this about what is so for a sick one—for example, drugs and surgery. Similarly, what is pleasant for a healthy and sound body is unconditionally pleasant—for example, seeing in the light and not in the dark (and yet for someone suffering from conjunctivitis it is the opposite). And a

69. Euripides, *Trojan Women* 1051.

more pleasant wine is not the one that is so to the person whose tongue has been destroyed by drunkenness (since sometimes these, at any rate, add sour wine to it), but rather what is so to a perceptual modality that is not destroyed. It is likewise **1236^{a}1** too in the case of the soul, that is, it is not unconditionally pleasant what is so to children or wild beasts, but what is so to mature adults. At any rate, when we remember both, we choose the latter. And as a child or a wild beast stands to a mature adult, so the base and foolish person stands to the decent and practically 5 wise one. And to these the things in accord with their states are pleasant, and these things are the ones that are good and noble.

Since, then, things are [said to be] good in several ways (for we say that one thing is good because it is of a certain quality, another because it is beneficial and useful), and further, since the pleasant is, in the one case, unconditionally pleasant and unconditionally good and, in the other, pleasant to a particular person or an 10 apparent good, and just as even in the case of inanimate things it is open to us to choose something and love it because of each of these, so it is too with a human being. For we can choose and love one for being of a certain quality and because of virtue, another because he is beneficial and useful, and another because he is pleasant and because of pleasure. He becomes a friend, then, whenever being loved he loves in return, and neither of them in any way fails to notice this. 15

It is necessary, therefore, for there to be three forms of friendship, and not all said to be such with reference to one thing, or as forms of a single kind, or altogether homonymously. For they are said to be friendships with reference to one primary form, as with medical; for we say that a soul, a body, an instrument, and a work 20 are medical, but it is the primary one that is said to be so in the strict sense. And primary is that whose account is present in all cases. For example, a medical instrument is one the doctor would use, but the account of the instrument is not present in that of the doctor.

In every case, to be sure, what is primary is what is sought. And because the universal is primary, people also assume that the primary is universal. But this is false. 25 So as regards friendship too they cannot account for all the things that appear to be so. For when a single account does not fit [all], they think that the others are not friendships. But they are, although not in the same way. But when primary friendship does not fit, on the supposition that it is universal, if indeed it is primary, they claim 30 that the others are not in fact friendships at all.

But there are many forms of friendship. Indeed, this was already stated, since three ways were distinguished[70] in which something is said to be friendship. For one was distinguished as being because of virtue, another as being because of utility, and another as being because of pleasure.

Among these, the friendship because of utility is that of the largest number of people; for people love each other because, and to the extent that, they are useful, as 35

70. 1236^{a}16.

the proverb says, "Glaucus, a man is a friend so long as he fights in the battle,"[71] and "the Athenians no longer know the Megarians."[72] On the other hand, the friendship characteristic of the young is because of pleasure (for this is what they have perception of). That is why the friendship of young people is easy to change; for when their characters change as they grow up, so too does what is pleasant. But the friendship **1236b1** that is in accord with virtue is that of the best people.

It is evident from these considerations that the primary form of friendship, that of good people, is reciprocal friendship and reciprocal deliberate choice with regard to each other. For to one who loves, the object of love is an object of friendship, and a friend, to the object of love, is when the love is also reciprocal.[73] This form of friendship, then, is surely found only among human beings (for they alone perceive deliberate choice). But the other forms are also found among beasts; and it is evident that utility is present to some small extent among them both in relation to humankind, in the case of domestic animals, and in relation to each other—for example, Herodotus says[74] that the crocodile bird is useful to the crocodile, and as prophets say of the associations and dissociations of birds.[75]

Also, base people could be friends with each other both because of utility and because of pleasure. But because the primary form is not present among them, [some] people say that they are not friends; for a base person will of course do injustice to a base person, and those who suffer injustice are not friends to each other. But it is not the case that they are not friends at all, though their friendship is not of the primary form, since nothing indeed prevents it from being of the other forms. For they put up with each other because of pleasure, even when they are harmed, as if they lacked self-control. But those who love each other because of pleasure do not seem to be friends either, when inquired into with exactness, because it is not the primary form; for the latter is stable, the former unstable. It is friendship, however, as has been said,[76] although not of the primary form, but derived from it.

To speak of friendship in that way only, then, is to do violence to the things that appear to be so, and makes it necessary to state unacceptable things. But it is impossible for all of them to be friendships in accord with a single account. The possibility that remains, therefore, is this: in one way, only the primary form is friendship, but in another way all are—not homonymously and having a random relationship to each other, nor in accord with one form, but rather with reference to one [form].

But since the same thing, and at the same time, is unconditionally good and unconditionally pleasant, provided nothing impedes it, and the true friend and the one that is unconditionally a friend is the primary one, and the one choiceworthy

71. Attributed to Archilochus of Paros, Fr. 13 Diehl.
72. Source unknown. Megara allied itself sometimes with Athens, sometimes with Sparta.
73. Reading φίλος δὲ τῷ φιλουμένῳ καὶ ἀντιφιλῶν.
74. 2.68.
75. *HA* 608b25–29.
76. 1236a16–20.

because of himself is of this sort (and it is necessary for him to be of this sort; for one wishes good things to exist for someone because of himself, so it is necessary also to choose for him to exist), the true friend is also unconditionally pleasant. That is why, indeed, it seems that any sort of friend is pleasant.

But we must draw further distinctions about this; for there is something to give us pause: Is it the good for oneself or the unconditional good that is loved? And is it that active loving involves pleasure, so that the object of love is also pleasant, or not? For one must bring both together to the same [resolution]; for indeed what is not unconditionally good but could turn out bad is worth avoiding. And what is not good for oneself is nothing for oneself. But this is what one is seeking, namely, for unconditionally good things to be good in this way. For what is unconditionally good is [unconditionally] choiceworthy, while what is good for oneself is choiceworthy for oneself. One must harmonize these. And that is what virtue does. And politics sees to this, in order that it might come about in those in whom it has not yet done so.

Moreover, as a human being, one is well adapted and *en route* to this; for things that are unconditionally good are by nature good for oneself.[77] But the route is via the pleasant; and what is noble is of necessity pleasant. But when these are in discord, one is not yet completely excellent; for it is possible for lack of self-control to arise; for the discord between the good and the pleasant in one's feelings is lack of self-control.

So, since the primary form of friendship is in accord with virtue, the friends themselves will also be unconditionally good. And this not because they are useful, but in another way; for what is good for this person and good unconditionally are two different things. And similarly, as it is in the case of the beneficial, so it is too in the case of states; for what is unconditionally beneficial and what is so for someone are distinct, for example, physical training from being treated with drugs. So too for the state of character, human virtue. For let it be the case that the human being is among the things that are excellent by nature; for the virtue of something that is excellent by nature is unconditionally good, while that of something that is not is so [only] for it. The like holds, then, with the pleasant.

Here, indeed, is where we must pause and investigate whether there is friendship without pleasure, and what difference it makes, and in which of the two the loving consists. Is it because he is good, even if he is not pleasant, but not because of this? Loving, of course, is said in two ways;[78] is it, then, because it is good that active loving appears not to occur without pleasure? It is clear that just as fresh episodes of contemplation and learning are especially perceived because of their being pleasant, so it is too with recognitions of those we are friends with. And the same account applies to both cases. By nature, at any rate, the unconditionally good is unconditionally pleasant, and it is pleasant for those it is good for. That is why like things enjoy each other immediately, and a human being is the most pleasant thing for a human being.

77. Accepting the seclusion of ὁμοίως … ἀφυοῦς.
78. As an activity and as a state.

So, since this is so even for an incomplete person, it is clear that it is so for one that has been completed. And the excellent person is complete.

But if active loving is a reciprocal deliberate choice, involving pleasure, of getting to know each other, it is also clear that, in general terms, the primary form of friendship is a reciprocal deliberate choice of unconditionally good and pleasant things, because they are good and pleasant. And friendship itself is the state that this sort of deliberate choice stems from. For its work is an activity, and this is not external, but within the lover himself, while the work of every capacity is external; for it is either in something else or in something insofar as it is something else. That is why loving is enjoyable, but being loved is not enjoyable. For while being loved is the activation of what is beloved, loving is in fact the activation of friendship, and while the latter occurs [only] in animate things, the former also occurs in inanimate ones; for even inanimate things can be loved.

But since active loving is treating the beloved as beloved, and a friend is beloved by his friend as a friend, and not insofar as he knows music or knows medicine, the pleasure from a friend, therefore, is due to him insofar as he is himself, and this is the pleasure fitted to friendship. For [the lover] loves *him*, not because he is something else.[79] So, if he does not enjoy him insofar as he is good, it is not the primary form of friendship. Nor should any of his coincidental qualities impede more than his goodness gladdens. For if someone smells very bad, he gets left; for his goodwill is liked, but one does not live together [with him].

This, then, is the primary form of friendship, which all agree on. And because of it the others seem not only to be forms of friendship but are also disputed about. For friendship seems to be something stable and only the primary form is stable. For a formed judgment is stable, and things that do not come about quickly or easily make the judgment correct. And without trust friendship is not stable, and trust takes time. For one must put a person to the test, as Theognis too says:

> For one could not know the mind of man or woman
> Until you put it to the test, just as with a beast of burden,[80]

nor without time there is there a friend. But people wish to be friends, and it is this sort of state that one most easily mistakes for friendship; for when people are eager to be friends, because they perform all the services fitted to friendship for each other, they think that they do not [just] wish to be but are friends. But what happens in other cases also happens in the case of friendship. For it is not the case that if people wish to become healthy, they become healthy, so neither is it the case that if they wish to be friends, they immediately are in fact friends. A sign of this is that those who are disposed in this way easily believe slander [about each other] without a test, while about matters concerning which they have given a test to each other, they

79. I.e., knowledgeable about music or whatever.
80. Lns. 125–126 Diehl.

do not easily believe slander, but about matters concerning which they have not, they are persuaded when the slanderers state signs of it.

At the same time, it is evident that this [primary] form of friendship does not exist at all among base people; for the base person is untrustworthy and cynical toward everyone; for he measures others by himself. That is why good people are more easily deceived, unless due to a test they are mistrustful. And base people choose things that are by nature good in place of their friend, and none of them loves a person more than things. So they are not friends. For it is not in this way that the things of friends become common possessions; for the friend is assigned to the class of things, not the things to the friends.

The primary form of friendship, therefore, does not come about with many people, because it is difficult to put many to the test; for one would have to live with each of them. Nor, then, must one choose a cloak and a friend in the same way, and yet it seems characteristic of the person with understanding to choose the better of two things in every case: if one has been wearing the worse cloak for a long time, and has not yet worn the better one, one must choose the latter, but one must not choose instead of the long-time friend the unknown person, if he is better; for a friend is not to be had without a test nor in a single day, but rather time is needed. That is why "the bushel of salt" came to be proverbial.[81] At the same time he must not be unconditionally good only, but also good for you, if indeed he is going to be a friend to you. For someone is unconditionally good by being good, but he is a friend by being good for another, and unconditionally good and a friend when both are in harmony, so that what is unconditionally good is the same for another, but if not, then unconditionally for the excellent person and good for another because he is useful. And being a friend to many at the same time prevents one from [active] loving; for it is impossible to be active toward many at the same time.

From these considerations it is evident that it is correct to say that friendship is something stable, just as happiness is something self-sufficient. And it has been correctly said that "nature is stable, but wealth is not"[82] (though it is much better to say that virtue is than that nature is). Also, time is said to reveal who is loved, and strokes of bad luck to do so more than strokes of good luck. For it is then clear that the things of friends are common possessions, since it is only friends of the sort who, instead of things that are by nature good or by nature bad (which are what good as well as bad strokes of luck have to do with), choose a person rather than that some of these things exist or do not exist. And bad luck reveals those who are not real friends but just happen to be so because of utility. Time reveals both; for not even the useful person is revealed quickly [as not being a real friend], but rather the pleasant one is (except for the unconditionally pleasant one, who is

81. People have to share many meals (and so the salt involved) with each other before they become friends.
82. Euripides, *Electra* 941.

not revealed quickly either). In fact, people are like wines and foods. For though time quickly reveals, indeed, that some of them are pleasant, with more time they become distasteful and not sweet; and the case of human beings is similar. For what is unconditionally pleasant must also be determined by the end and by time. And even ordinary people would agree with this, and not only on the basis of after-effects, but as in the case where they call a drink "too sweet"; for it is not because of its aftereffects that they call a drink "not pleasant," but because it does not continue [to be pleasant], although it deceives at first.

The primary form of friendship, then, and the one because of which the others are so called, is the one in accord with virtue, and because of the pleasure of virtue, as was said previously.[83] The other forms of friendship are even found in children, wild beasts, and base people. Hence the sayings, "People of the same age delight each other,"[84] "Bad to bad by pleasure's fused."[85] Moreover, it is possible even for base people to be pleasant to each other, not insofar as they are base or neither [base nor good], but (say) as both being musicians, or one a music lover and the other a musician. And insofar as all have something good in them in this respect they fit in with each other. Further, they could be useful and beneficial to each other, not unconditionally but relative to their deliberate choice, or insofar as they are neither [base nor good].

1238b1 Moreover, it is possible for the decent person to be friends with a base one. (For there is utility relative to the deliberate choice: the base person is useful relative to the present deliberate choice of the excellent person, the excellent person is useful relative to the present deliberate choice of the person who lacks self-control, but useful to the base person only relative to the deliberate choice in accord with nature.) And he will wish good things for him, unconditionally wishing unconditionally good ones, but wishing on the basis of a hypothesis for the ones that are good for him (insofar as one might be advantageous in poverty or disease), and wishing these for the sake of what is unconditionally good (in the way that drinking the medicine itself in fact is; for one does not wish for it [unconditionally], but rather wishes it for the sake of this [good]).

Further, in these ways those who are not excellent could also be friends with each other; for one could be pleasant to the other not insofar as he is base, but insofar as he shares in something common, for example, if he is musical. Further, they could be friends insofar as there is something decent in everyone (which is why some might be glad to associate with an excellent person), or insofar as they fit in with each other; for all possess something of the good.

83. 1236b2–1237b7.
84. Source unknown.
85. Euripides, *Bellerophon*, Fr. 298 Nauck.

7.3
Friendship and Equality

There are, then, these three forms of friendship. And in all of these, friendship is in a way said in accord with equality; for even those who are friends in accord with virtue are in a way friends with each other by equality in virtue.

But there is another difference among these that is in accord with superiority, as the virtue of a god is in relation to a human being. For this is a distinct form of friendship. And so, in general, is that of ruler and ruled, as what is just is also distinct; for the equality is proportional and not arithmetical. Within this kind is father in relation to son, benefactor in relation to beneficiary; and there are differences among these too; for that of father in relation to son and that of husband in relation to wife are distinct, the latter being that of ruler to ruled, the former that of benefactor to beneficiary. In these friendships there either is no reciprocal loving present, or not in the same way. For it would be ridiculous if someone were to reproach the god, because he does not reciprocate love in the same way as he is loved, or for the ruler and the ruled; for being loved, not loving, is characteristic of the ruler, or loving in another way. And no less does the pleasure of a self-sufficient person in his own possessions or his child differ from that of a needy person in what he acquires.

It is the same way both in the case of those who are friends because of utility and in the case of those who are so because of pleasure. Some are in accord with equality, others in accord with superiority. That is also why those who think they are friends in the former way blame their friends if they are not similarly useful and do not do them similar good, and the same applies in the case of pleasure. This is clear in sexual relationships; for this is the cause of their fighting often with each other. For the lover is ignorant of the fact that, in the case of desire's eagerness, the ratio is not the same for them. That is why Eunicus said, "You speak like a beloved, not a lover."[86] But lovers think the ratio is the same.

7.4
Friendship between Unequals

As was said,[87] then, there are three forms of friendship—in accord with virtue, in accord with utility, and in accord with pleasure—and these are again divided into two; for some are in accord with equality, others in accord with superiority; but, though both are friendships, friends are the ones in accord with equality; for it would be strange if a man were a friend of [his] child, though he certainly loves him and is loved in return. Sometimes, however, the superior partner should be loved, but if he **1239ᵃ1**

86. 1.781 Kock.
87. Most recently at 1238ᵇ14.

loves, he is reproached for loving someone unworthy; for he is measured by the worth of his friends and by a sort of equality.

Some people, then, are unworthy of being similarly loved because of age, others in accord with virtue, or family, or some other sort of superiority. But people always think it fitting for the superior—whether in utility, in pleasure, or in accord with virtue—to love less or not at all. But where the degree of superiority is small, disputes predictably arise (for in some cases what is small has no strength at all, as in weighing wood, but in the case of gold it does). People, though, are bad at judging what is small; for one's own good appears large because it is close at hand, while another person's appears small because it is far off. But whenever the degree [of superiority] is excessive, not even the inferior parties themselves demand that they should be reciprocally loved, or be reciprocally loved in a similar way—for example, suppose someone expected the god [to do so]! So while it is indeed evident that they are friends when on equal terms, there could be reciprocal loving without their being friends.

On the other hand, it is clear why human beings seek the friendship that is in accord with superiority rather than with equality; for in this way they can both be loved and maintain superiority. That is why the flatterer is held in higher esteem than the friend by some people (for he appears to provide both to the one he flatters). And honor-lovers are most of all people of this sort; for to be admired is to be in a position of superiority. And by nature some people are disposed to friendship while others are lovers of honor. And the person disposed to friendship is the one who enjoys loving more than being loved, while the other loves honor more. He, then, who in fact enjoys being admired and loved is a friend of superiority, while the one disposed to friendship is a friend of the pleasure that lies in loving; for it is necessarily present in its being active; for being loved is something that befalls one. In fact it is possible to be unaware of being loved, but not to be unaware of loving.

And loving is more in accord with friendship than being loved, while being loved is more in accord with the object of love. A sign of this is that the friend, if he cannot have both, would choose to know the other rather than to be known, as women do when they give away their children to others, and Andromache does in Antiphon's play.[88] For wishing to be known seems to be for one's own sake, and for the sake of receiving something good, but not doing it, while knowing the other is for the sake of doing and loving. That is also why we praise those who remain loving toward the dead; for they know, but are not known.

1239b1

It has been stated, then, that there are several modes of friendship, how many they are (three), and that being loved, being loved reciprocally, and the friends (both those that are in accord with equality and those that are in accord with superiority) are different.

88. The play referred to is lost, but in Euripides' *Andromache*, Andromache sends away her son to prevent him from being killed.

7.5
Friendship and Likeness

But since friend is also said of things in a more universal way, as was also stated at the start,[89] by those who bring in considerations from outside (for some say that what is like is a friend, others the contrary), we must also speak about how these are related to the forms of friendship that were mentioned.

Likeness is referred back both to the pleasant and to the good. For the good is simple, while the bad is multiform. And the good person is always the same, and his character does not change, while the base one, or the foolish one, is not at all the same in the morning as in the evening. That is why base people, unless they make contracts, are not friends, but are at variance. And a friendship that is not stable is no friendship. So in this way what is like is a friend, because what is good is like itself. But in a way it is also in accord with the pleasant; for the same things are pleasant for those who are alike, and each is by nature pleasant to itself. That is also why the voices, states, and pastimes of those who are of the same kind are most pleasant to each other, as also in the case of the other animals. And it is in this way that it is possible even for base people to love each other.

But contrary is friend to contrary as being useful; for what is like is useless to itself. That is why master needs slave and slave master, and wife and husband need each other. And what is contrary as being useful is pleasant and an object of appetite, not as included in the end but as furthering the end. For when one gets what one has an appetite for, one is at the end and does not desire the contrary, in the way the hot desires the cold and the wet desires the dry.

But in a way even friendship for what is contrary is for the good; for the parties desire each other because of the mean; for as two halves of the same coin they desire each other because in this way a single mean comes about from both.

Further, the desire is coincidentally for the contrary but intrinsically for the mean. For contraries desire not each other but the mean. For if those that are very cold are heated they settle into the mean condition, as do the very hot if they are cooled, and it is the same way too in the other cases. Otherwise, they will always be in a state of appetitive desire, because not in the mean conditions. But the person who is in the mean condition, without appetitive desire, is enjoying what is by nature pleasant, while the others enjoy everything that takes them out of the natural state. This form [of friendship], then, exists even in inanimate things, but loving comes about when it exists in animate ones. That is why people sometimes enjoy what is unlike them—for example, serious people enjoy witty ones, and quick-tempered people enjoy easy-going ones; for they are brought into the mean condition by each other. Coincidentally, then, as was said,[90] contraries are friends, and are so because of the good. **1240ᵃ1**

89. 1235ᵃ4–30.
90. 1239ᵇ32.

How many forms of friendship there are, then, and what the differences are in accord with which people are said to be friends, or to be lovers and beloveds, both when this constitutes friendship and when it does not, have now been stated.

7.6
Self-Friendship (Self-Love)

Whether or not one is a friend to oneself requires much investigation. For to some people it seems that each person is most of all a friend to himself, and they make use of this as a standard by which to judge the friendship in relation to other friends. But according to the arguments and the things believed to be characteristic of friends, the two are in some respects contrary, and in others manifestly alike. For in a way this friendship is friendship by analogy, but not unconditionally friendship; for the being loved and loving are present in two distinct things. That is why he is a friend to himself more in the way that the person who lacks self-control, and the person who is self-controlled, are said to act in a way voluntarily and in a way involuntarily, due to the fact that the parts of the soul stand in some sort of relation to each other. And all cases of this sort are alike, whether someone is a friend to himself or an enemy, and whether he does injustice to himself; for all these are present in two distinct things. Insofar, then, as the soul too is in a way two things, these relations do in a way belong to it, but insofar as the things are not distinct, the relations do not belong to it.

And from a person's state in relation to himself the other modes of friendship—the ones in accord with which we usually investigate [friendship] in our accounts[91]—are determined. For a friend seems to be the one who wishes good things to someone, or the sorts of things he thinks are good, not because of himself, but for the sake of the other. But in another way, if one wishes that the other exist because of himself and not because of oneself, even if not apportioning good things to him, let alone existence, one would most of all seem to love him. In another way, if he is the one with whom one chooses to live because of his company and not because of something else. For example, fathers choose that their children exist, but live with other people. All these views, of course, clash with each other; for some people do not think they are loved if the other does not [wish good things] for them, others if he does not [wish] their existence, others if he does not [wish] to live together with them.

Further, we will suppose that sharing in the suffering of one who suffers is a mark of loving, when it is not because of something else (like slaves in relation to their masters because they are harsh when in pain) but because of the sufferers themselves, like mothers for their children and birds who share each other's suffering.[92] For the friend most wishes not just to share in the pain of his friend, but even the same pain,

91. The phrase recurs at 1244[a]21; the reference is not entirely clear.
92. *HA* 612[b]34–613[a]2.

if possible (for example, sharing in thirst if his friend is thirsty), or if not, very close to it. And the same account also applies to enjoying; for it is fitted to friendship to rejoice not because of something else but because the other is rejoicing.

Further, things of the following sort are said about friendship: "friendship is equality," and "true friends are one soul." But all of these things are ascribed to the one individual; for he in fact wishes good things to himself in this way. For no one does well for himself because of something else, or of gratitude, nor does he say he did so, insofar as he is one individual; for someone who makes it clear that he loves wishes to seem to love, but not to love. And above all existing, living together, enjoying together, suffering together, and being one soul, of course, and not being able even to live without each other, but rather dying together—for this is how it is for the one individual, and how he associates with himself. **1240^{b}1**

All these things belong to the good person in relation to himself. But in the wicked one they are in discord, as they are in the person who lacks self-control. And that is why it seems possible for one even to be one's own enemy. Insofar as a person is one and undivided, however, he is an object of desire to himself. And the good person and the friend in accord with virtue are of this sort, since the wicked person, at any rate, is not one but many, and in the same day becomes another person and is unstable. So even a person's love for himself is referred back to that for the good; for it is because he is in a way the same, one, and good for himself that he is thereby a friend to, and an object of desire to, himself. And a person is of this sort by nature, while the wicked one is contrary to nature.

And a good person does not reproach himself at once either, like the one who lacks self-control, nor does his later self reproach his earlier self, like the person who is full of regrets, nor his earlier self his later one, like the person who makes a false promise (in general, if one must draw the distinctions the sophists draw, it is like Coriscus and excellent Coriscus; for it is clear that their quantity of excellence is the same), since, when people bring a charge against themselves, they are condemning themselves to death. But it seems that everyone is good to himself. And the unconditionally good person seeks to be a friend to himself as well, as has been said, because he has two things within himself that by nature wish to be friendly and impossible to split apart. That is why, in the human case, each self seems to be a friend to itself. But not in the case of the other animals—for example, a horse [does not seem to be any of these things] to itself; and it is not, therefore, a friend [to itself]. But it is not so in the case of children either, though once they have deliberate choice it is; for only at that time is the child[93] in discord with appetite. The friendship one has for oneself, for its part, seems akin to that in accord with family ties; for in neither case is it up to the parties themselves to dissolve it, but rather, even if they differ, in the one case they are still family members, and in the other one is still one person for as long as one lives.

93. Or, more exactly, the understanding of the now adult child.

In how many ways, then, things are said to love, and that all the forms of friendship are referred back to the primary form, is clear from what has been said.

7.7
Friendship, Concord, and Goodwill

1241a1 It properly belongs to our investigation to get a theoretical grasp on both concord and goodwill. For it seems to some people that they are the same thing [as friendship], to others that they do not exist without each other.

Goodwill is neither altogether other than friendship nor the same thing. For, given that friendship is divided into three modes, goodwill is not present either in that due to utility or in that in accord with pleasure. For if one wishes good things for someone because it is useful, one would be wishing them not because of him but because of oneself, and it seems that, just as in the case of friendship, goodwill is not for oneself, the one who has the goodwill, but for the person one has goodwill for. And if goodwill were present in friendship for the pleasant, there would also be goodwill for inanimate things. So it is clear that goodwill has to do with character friendship. But while wishing alone is a mark of the person of goodwill, the friend must also do in action what he wishes. For goodwill is the starting-point of friendship; for every friend has goodwill, but not everyone who has goodwill is a friend; for the one with goodwill is like one who starts out, which is why it is a starting-point of friendship, but not friendship.

Friends seem indeed to be in concord and those in concord to be friends. But the concord fitted to friendship is not concerned with everything, but with the things doable in action by the ones in concord, and those that contribute to their living together. And it is not only concord with respect to thought or with respect to desire; for it is possible for what moves us to appetitively desire contrary things [to what thought prescribes], just as in the person who lacks self-control there is discordance. Nor is it the case that if there is concord with respect to deliberate choice, there is also concord with respect to appetite. But concord is found among good people—at any rate, when base ones deliberately choose and have an appetite for the same things, they harm each other.[94]

And it seems that concord is not said of things in a simple way, any more than friendship is. Instead, though the primary and natural sort is excellent (which is why it is not possible for base people to be in concord), there is another sort in accord with which even base people are in concord, whenever they have a deliberate choice and an appetite for the same things. But they must desire the same things in such a way that

94. Because they are then in selfish competition for the same appetite-satisfying things. See *NE* 1168a30–35.

it is possible for both to get what they desire; for if they desire the sort of thing that it is not possible for both to have, they will fight, while those in concord will not fight.

There is concord too whenever the deliberate choice of ruling and being ruled is the same, not each deliberately choosing himself, but both choosing the same person. And [this] concord is political friendship.

About concord and goodwill, then, let this much be said.

7.8
Benefactors and Beneficiaries

A puzzle arises as to why those who benefit others love their beneficiaries more than the beneficiaries love their benefactors, while the contrary seems to be just. And one might suppose that this comes about because of what is useful and what is beneficial to the person; for something is owed to the one and the other must make a return. But it is not only that this does happen; it is also natural. For the activity is more choiceworthy, and here the work and the activity have the same account, and the beneficiary is, as it were, the work of the benefactor. That is why even in animals there is concern for offspring, both in begetting them and in preserving them once they are born. And fathers (and mothers more than fathers) love their offspring more than they are loved. And these in turn love their own offspring more than they love their parents, because the activity is the best thing. And mothers love more than fathers because they think that the offspring are more their own work; for people determine work by its difficulty and the mother suffers more in childbirth.

7.9
Friendships and Communities

Also, as regards friendship with oneself and within a group, let it be determined this way. It seems both that the just is a sort of equality and that friendship consists in equality, if it is not said pointlessly that "friendship is equality." And all constitutions involve a form of justice; for they are a community, and everything that is common is established by means of justice. So there are as many forms of justice and of community as there are of friendship, and all these border on each other and exhibit nearly the same difference. But since the relations of soul to body, of craftsman to instrument, and of master to slave are all alike, there is no community between these; for they are not two, but rather one, and the other is part of the one. Nor is what is good for each of them divided, but rather the good of the one for whose sake the other exists is good for both of them; for the body is in effect an innate instrument; a slave is a sort of part and detached instrument of his master; and an instrument is a sort of inanimate slave.

And the other communities are part of the city's communities—for example, that of the clans, the religious cults, or the crafts of wealth acquisition. And all the constitutions co-exist among family members, both the correct constitutions and the deviant ones (for it is just the same in constitutions as it is in the case of musical harmonies): kingship is that of the father, aristocracy that of husband and wife, while that of brothers is a polity. And deviations from these are tyranny, oligarchy, and democracy. There are, then, that many sorts of justice.

But since some equality is arithmetic and some proportional, there will also be forms of justice, friendship, and community. For the democratic community[95] and companionate friendship are arithmetic; for they are measured by the same defining mark. But the aristocratic one, which is best, and the kingly one are proportional. For it is not the same thing that is just for superior and inferior, but rather what is proportional. The friendship of father and son is like that, and in communities it is the same way.

7.10
Political Friendship

1242a1 Friendships are said to be familial, companionate, or communal (so-called political friendship).

Familial friendship, for its part, is of many forms, one that of brothers, another that between father and sons (for it is both proportional, like paternal friendship, and arithmetic, like that of brothers; for the latter is close to companionate friendship; for there too they claim privileges of seniority). Political friendship, on the other hand, is most certainly established in accord with utility; for people seem to come together because they are not self-sufficient, since they would have come together, at any rate, even for the sake of living together. Only political friendship and the deviation from it are not merely friendships, but it is also as friends that people are community members, while the other friendships are in accord with superiority. But the justice in utility friendship is most of all justice, because it is political justice; for a saw and a craft come together in another way, not for the sake of something common (for then an instrument and a soul would be a whole) but for the sake of the user. But it also happens that instrument itself gets care of the sort that is just in relation to its work; for it exists for the sake of the latter. And the being for a drill is twofold, of which the one in the fuller sense is the activity, the drilling. And in this form are included the body and the slave, as was said previously.[96]

To investigate how one should associate with one's friend, then, is to investigate a sort of justice. For, in general, the entirety of justice is in fact in relation to a friend;

95. Reading ἡ δημοκρατικὴ κοινωνία.
96. 1241b18–23.

for what is just is so for certain people, that is, for community members, and a friend is a community member, of the family in one case, of life in the other. For a human being is not only a political animal, but also a household-managing one, and, unlike the other animals, which, whether male or female, copulate in season with just any random partner, but otherwise are solitary throughout life; on the contrary, a human is an animal disposed to form a community with those with whom it is by nature of the same kind. Therefore, there would be both a community and a sort of justice, even if there were not a city. And a household is a sort of friendship.

The relationship between master and slave, then, is the very same as between craft and instruments, soul and body, but such relationships are neither friendships nor sorts of justice, but something analogous, just as the healthy is not just but something analogous. But between wife and husband there is friendship as something useful and a community. And the friendship of father and son is the very same as that of god to human, benefactor to beneficiary, and, in general, of what is by nature a ruler to what is by nature ruled. But that of brothers for each other in accord with equality is above all companionate:

> For never was I proved by him to be a bastard,
> But for both of us the father was declared the same,
> My ruler, Zeus.[97]

For this is what is said by people seeking equality. That is why it is in the household that one first finds the starting-points and sources of friendship, constitution, and justice.

But since there are three forms of friendship (in accord with virtue, with utility, and with pleasure) and each of these has two different varieties (for each of these is in accord with either superiority or with equality), and the just in each of them is clear from the disputes, [it follows that] in the friendship in accord with superiority the friends claim what is proportional, but not in the same way; instead, the superior person claims what is inversely proportional, that as he stands to the inferior, so too what comes from the inferior stands to what he provides, his position being like that of ruler in relation to ruled. But if this is not the case, at all events, he claims what is numerically equal. (And it is especially like this in other communities too; for sometimes their shares are numerically equal, while at other times they are equal in ratio; for if each contributes a numerically equal amount of silver, they make an equal division, that is, a numerically equal one. But if it is unequal, then a proportional one.) The inferior person, on the contrary, inverts the proportion, and couples diagonally.[98]

97. Sophocles, Fr. 688 Nauck.

98. The four points of the square are the superior, the inferior, the superior's contribution, and the inferior's contribution. The superior thinks that the inferior should contribute more than he does, in proportion to his own superiority; the inferior wants the services rendered to be equal, and thus couples, or equalizes, the points represented by the two contributions.

But in this way the superior person would seem to come out worse and the friendship and the community to be a public service. One must, therefore, equalize and produce a proportion by means of something else. And this is honor, which is precisely the thing that belongs by nature to the ruler—and to the god—in relation to the ruled. And the profit must be equalized relative to the honor.

The friendship that is in accord with equality is political friendship. And political friendship is in accord with utility, and just as cities are friends with each other, so too are the citizens as well and in like fashion: "The Athenians no longer know the Megarians."[99] Neither do the citizens when they are not useful to each other, but rather their friendship is a hand-to-hand exchange. And here too there is a ruler and a ruled, though neither natural nor kingly ones, but taking turns. And it is not for the sake of conferring a benefit, like a god, but in order that there be equal sharing in the good and in public service. Political friendship, then, tends to be in accord with equality.

But there are two forms of utility friendship, one legal and the other ethical. And political friendship looks to equality and to the thing at hand, as buyers and sellers do. That is why it is said "To a friendly man his wage."[100] When it is in accord with an agreement, then, this political friendship is also legal. But when the partners trust each other, it tends to be ethical and companionate. That is why there are complaints most of all in this form of friendship. And the cause is that it is contrary to nature; for friendship in accord with utility and friendship in accord with virtue are distinct. But the parties wish to have both at the same time, that is, they associate for the sake of utility, but they make it ethical, as decent people do. That is why, as trusting each other, they do not make it legal.

For in general, of the three forms, most complaints arise in utility friendship; for virtue leaves no grounds for complaint; pleasure friends get it, give it, and depart; but utility friends, if their dealings are not legal but companionate, do not dissolve their relationship right away. Nonetheless, legal utility friendship also leaves no grounds for complaint. And the legal resolution is to look to money (for it is by it that the equal is measured), while the ethical is voluntary. That is why there is a law in some places that those whose association consists in being friendly in this way are not to bring lawsuits over voluntary transactions—and rightly so; for it is not naturally just for good people to do so, and these people engage in transactions as good and trustworthy people. And in this form of friendship the complaints are dubious on both sides, as to how either will complain, when they trusted ethically, not legally.

Also, there is certainly a puzzle about what way one should judge what is just, whether in relation to the thing at hand, looking to how large the service rendered was, or of what sort the beneficiary. For it is possible for it to be precisely the way

99. 1236ª37.

100. Hesiod, *Works and Days* 370.

Theognis said, "A small thing for you, goddess, but for me a great one."[101] But it is also possible for the opposite to come about, as in the saying, "It's an amusement for you but death for me."[102] Hence the complaints. For the benefactor claims recompense as having done a great service, because he did it for someone in need, or something else of that sort, stating how much of a benefit it was able to produce for the other party, but saying nothing about what it meant for himself, while the beneficiary does the contrary, stating how much it was for the other party, but not how much it meant to himself.

Sometimes too when they are the recipients there is doubt. For the beneficiary states how little benefit resulted for him, while the benefactor states how great a thing it was for him to do it—for example, if the latter took great risks to confer a drachma's worth of benefit, he speaks of the amount of danger, the other of the amount of money, just as in the repayment of a financial loan. For there too the disputes are about these things; for, unless they have made the matter explicit, one wants its value to be what it was then, the other what it is now.

Political friendship, then, looks to the agreement and the thing, while ethical friendship looks to the deliberate choice. So the latter is more of a just thing, and a justice fitted to friendship. The cause of the fighting is that ethical friendship is more noble, utility friendship more necessary. People start as if they are ethical friends, and being friends because of virtue, but when opposed over some aspect of their individual interests, it becomes clear that they were something else. For ordinary people pursue the noble when they have an abundance of property, which is also why they pursue the nobler form of friendship.

So it is evident how to make determinations about these cases. For if they are **1243^{b}1** ethical friends, one must look to their deliberate choice to see whether it was fair, and then nothing else must be claimed by either party against the other. But if they are useful and political friends, one must look to see how their agreement would have been profitable. If one party says it's one way, and the other that it's the other, it is not a noble thing, when repayment must be made, to speak noble words (and it is the same way in the other case). But since they did not make this explicit, as is ethically done, someone must render a judgment, and neither of them should be deceptive in answering. So each must be content with his luck.

But that ethical friendship is in accord with deliberate choice is clear, since even if after having received great benefits one does not repay them because of inability, but does so to the extent one can, one acts nobly. Even the god is content with receiving sacrifices that are in accord with our capacity. But it will not be enough for a seller, if one says that one is not able to pay more, nor for a lender.

Many complaints arise in friendships for those not on a straight course, and seeing what is just is not easy. For it is difficult to measure what is not on a straight course

101. Theognis, ln. 14 Diehl.
102. Source unknown.

by one thing, as happens in the case of sexual relationships; for the one party pursues the other as pleasant to live with, while the other at times pursues the one as useful. But when the pursuer's love ceases, because the other has changed, he changes, and then they both rationally calculate the quid pro quo, and disagree: as Pytho and Pammenes[103] did; as, in general, teacher and student do (for scientific knowledge and money are not measured by one thing); as Prodicus[104] the doctor did with the person who paid him [too] small a fee; and as the lyre player and the king did. For the king associated with the lyre player as pleasant, the lyre player with the king as useful. Then, when the king had to pay, he made out that he was himself involved as being pleasant, and said that just as the lyre player had pleased with his singing, so had he by making promises.

Nonetheless, here too it is evident how one may recognize [what is just]; for here too one must measure by one thing—not by a single term, however, but by a ratio (for one must measure by what is proportional), just as political community too is measured. For how will a shoemaker have communal relations with a farmer if their works are not equalized by proportionality? And for those whose relationship is not on a straight course, the proportional is the measure—for example, if one party complains that he has given wisdom, and the other money, what is the ratio of the wisdom to the wealth? And then what is what has been given to each? For if one has given half of the lesser thing, while the other has given not even a small fraction of the greater one, it is clear that the latter is being unjust. But here too it may be in a starting-point that dispute lies, if one says that they came together as useful to each other, while the other denies it, saying that it was in accord with some other sort of friendship.

7.11
Problems about Friendship

1244a1 As regards the good person, and the friend in accord with virtue, we must investigate whether it is to him that one should provide useful services and help or to someone who is capable of making a return. This is the same problem as whether one must benefit the friend or the excellent person more. For if someone is a friend and also excellent, it is presumably not a very difficult one, provided that one does not amplify the one factor and diminish the other, doing a lot for him as a friend, but little for him as decent. But if not, many problems arise—for example, if one person was a friend but will not be in the future, while another will be one but is not yet; or if one person became a friend but is not one now, while another is a friend now but was not one nor will be one in the future.

103. The identities are uncertain. Pammenes may be the famous Theban general of that name, in which case Pytho is unknown. Or Pytho may be the Byzantine rhetorician and ambassador of Philip of Macedon, and Pammenes an otherwise unknown student of his.
104. Perhaps the Hippocratic doctor from Selymbria.

But the first problem is more difficult. For perhaps Euripides was on to something when he wrote:

> Words are just wages if words you bring,
> But a deed for him who a deed supplies.[105]

Also, not all things are owed to the father, but there are others that are owed to the mother; and yet the father is better; for not all sacrifices are owed to Zeus, nor does he receive all the honors, but [only] some. Perhaps, then, some things are owed to the useful person, others to the good one. For example, if someone provides food and necessities, he is not also owed being lived with; therefore, one who is owed being lived with is also not owed the things that the utility friend provides but he does not. But those who do this, giving everything to their beloved when not owed, are worthless.

Also, all the defining marks of friendship in our accounts are certainly in a way marks of friendship, but not of the same form of it. For it is a defining mark of a utility friend and a benefactor and, indeed, of a friend of any sort to wish to do what is good for the other person (for this definition of friendship does not distinguish the sort); but to wish that another exist, to wish to live together with him, and to wish to be pained and pleased together with a friend in accord with pleasure [are distinct marks]. But all these defining marks are said of things in accord with certain sorts of friendship, but none in accord with just one sort. That is why there are several, and why each—for example, the deliberate choice of existence—seems to be, but none really is, that of a single sort of friendship. For the superior party and benefactor also wishes his own work to exist; and to the one who gives existence a return is also owed, but it is not with this person that one wishes to live together, but with the pleasant person.

Some friends do injustice to each other; for they love the things at issue more than the one who possesses them. That is why [each] is friends even with their things—for example, he has chosen wine because it is sweet, and wealth because it is useful; for it is more useful [than its possessor]. That is why, then, the friend gets annoyed, as if he had chosen more in return for less. And [such friends] complain; for they are now seeking someone who is a good person, having previously sought the pleasant one or the useful one.

7.12
Friendship and Self-Sufficiency

We must also investigate self-sufficiency and friendship, and how their capacities stand in relation to each other. For someone might raise a puzzle as to whether, if someone were self-sufficient in all respects, he will have [any need for][106] a friend, if **1244b1**

105. Fr. 890 Nauck.
106. Supplied to fill a lacuna in the manuscripts.

a friend is sought in accord with a need. Or is this not so? If the good person will be most self-sufficient, and the person with virtue is happy, why would he need a friend? For it is characteristic of a self-sufficient person to need neither useful people, nor amusing ones, nor living together [with others]; for to be with himself is sufficient for him.

This is especially evident in the case of a god; for it is clear that needing nothing added, he will not need a friend either, nor will there be [one] for him, for whom nothing is ever needed. So too a human being who is the happiest will least of all need a friend, except to the extent that it is impossible for him to be self-sufficient. It is therefore necessary for the one who is living the best life to have the fewest friends, and they must always be becoming fewer. And he must not treat as a serious matter that there should be friends, but rather be contemptuous not only of the useful ones, but even of those that are choiceworthy with a view to living together.

But then surely too in that case it would seem evident that the friend would not be for the sake of utility or benefit. But neither is he a friend because of virtue alone; for whenever we are in need of nothing, it is then that we all seek others to join us in our pleasures, and beneficiaries rather than benefactors. But we have better judgment when we are self-sufficient, which is when we also especially need friends worthy of living with, than when we are in need.

But we must investigate this puzzle, in case, while something is correctly said, something else escapes our notice because of the comparison [to a god]. But this is clear once we have grasped what living in accord with activity and as an end is. It is evident, then, that living in accord with activity is perceiving and knowing, so it also follows that living together is perceiving together and knowing together. But it is perceiving itself and knowing itself that is most choiceworthy for each thing, and because of this the desire for living is innate in all; for one should posit living as a sort of knowing. If, then, someone were to make a cut and produce knowing by itself and not [knowing] itself,[107] there would be no difference between somebody else knowing instead of oneself. But that would be like someone else living instead of oneself.

It is reasonable, indeed, that to perceive and to know oneself is more choiceworthy. For one must at the same time put together two things in the argument, both that the living is choiceworthy and that the good is, and, on the basis of these things, that the same sort of nature belongs to these. If, then, of a column-pair of this sort[108] one or other of the columns is always in the rank of the choiceworthy, both the knowable and the perceptible are generally speaking [in it] by having a share of the determinate nature. So to wish to perceive oneself is to wish oneself to be of such a nature. Since, then, we are not intrinsically each of these things, but rather by partaking of the capacities [active] in perceiving and knowing (for, when perceiving,

107. Accepting the seclusion of ἀλλὰ τοῦτο . . . λανθάνειν ("but this escapes notice, as it was written in the argument, though in the thing at issue it is something that does not escape notice").

108. *Met.* 1066a14–16.

one becomes perceptible in this way and in accord with this,[109] just as what one is antecedently perceiving does, and in accord with the way in which and what one is perceiving, and when knowing, one becomes knowable [likewise]). So because of this too one wishes always to live because one wishes oneself always to know, and this because one wishes oneself to be knowable.

Choosing to live together might seem to those investigating the matter to be in a way foolish, first, in the case of things we share in common also with the other animals—for example, eating and drinking together; for what difference does it make if these things occur among those nearby or those apart, if one sets aside speech? But surely even sharing in random conversation is another thing of this sort. At the same time, neither teaching nor learning is possible for friends who are self-sufficient; for if one is learning, one is not in the state one should be, and if the other is teaching, the friend is not. But the likeness [between them] is friendship.

But surely it appears at least that [one should choose to live with others], and that we all share in good things more pleasantly with friends, to the extent that these fall to each, and are the best of which he is capable. But of these, bodily pleasures fall to one, contemplation of music to another, and philosophy to another. And it should be at the same time as the friend (which is why one says "distant friends a burden are"), so that they should not be apart from each other when this is taking place. Hence sexual love too seems similar to friendship; for the lover desires to live together [with his beloved], though not in the way he most of all should, but in accord with perception.

Therefore, on the one hand, the argument says these things, in going through the puzzles, while, on the other hand, the fact is manifestly this [latter] way. So it is clear that going through the puzzles has led us astray in some way. Hence we must look to see what is true. For the friend wishes to be, as the proverb says, another Heracles, another oneself.[110] But he is split apart, and it is difficult for all to come about in one. But, while with respect to his nature a friend is what is most akin, one is like [him] with respect to body, another with respect to soul, and one with respect to one part of these, another with respect to another. But nonetheless the friend wishes to be, as it were, a separate oneself. To perceive one's friend, then, is necessarily to perceive oneself in some way, and to know oneself in some way. So it is reasonable for both mutual enjoyment of unrefined things and living together with the friend to be pleasant (for there is always a simultaneous perception of him), but more so in the case of the more divine pleasures. The cause of this is that it is always more pleasant to contemplate oneself [participating] in the better good. But sometimes this is a **1245^{b}1** feeling, sometimes an action, sometimes something else. But if [it is more pleasant to contemplate] oneself living well, and also in the same way one's friend, being active in living together, their community consists most of all of the ones included in their end. That is why it consists in contemplating together and feasting together, not for

109. *DA* 430^{a}2–5, *Met.* 1072^{b}20–23.
110. *NE* 1166^{a}31–32.

the sake of nourishment and the necessities (for associations of this sort seem not to be) but rather indulgences [only]. But it is in [pursuing] the end he is capable of achieving that each one wishes to live together with another. And if this is not possible, people most of all wish to benefit friends and be benefited by them.

Therefore, that we should live together with others, that all wish for this most of all, and that the happiest and best person is most of all of this sort is evident; and that this did not appear to be so according to the argument, though it was saying something true, happened reasonably too. For although the comparison [with a god] is true, the resolution is in accord with the putting together. For because the god is such as not to need a friend, its claim is that the one who is like him is such too. And yet according to this argument the excellent person will not even understand; for it is not in this way that the god is in a good state [of activity]; instead, he is better than to understand something else beyond himself. And the cause of this is that for us the good is in accord with something else, while for that being he himself is the good for himself.

As for our seeking and praying to have many friends, while at the same time saying that he who has many friends has none, it is correct to say both. For if it is possible to be living together and perceiving together with many at the same time, doing so with as many as possible is most choiceworthy. But since it is very difficult to do so, it is necessary for the activity of perceiving together to be among fewer, so that it is not only difficult to acquire many friends (for one must put them to the test) but also to make use of them when one has got them.

Sometimes too we wish the loved one to be absent, if he is doing well, while at other times we wish to share the same things, and wishing to be together is fitted to friendship; for when it is possible to both be together and do well everyone chooses it. But when it is not possible to be together, we choose, perhaps, just as his mother might have chosen for Heracles, to be a god rather than to be with her and to labor for Eurystheus.[111] For they all might also make a quip like the one made by the Spartan in a storm, when someone told him to call on the Dioscuri[112] for help.

It seems to be characteristic of the lover to keep others from sharing in his hardships, and characteristic of the beloved to wish to share in them. And it happens that both are reasonable. For nothing should be as painful to a friend as his friend is pleasant. On the other hand, it seems that he should choose what is not in his own interest. That is why people prevent sharing (for it is enough that they themselves are suffering), in order not to appear to be looking out for themselves, to be choosing enjoyment even at the cost of the suffering of their friend, and further, to be preferring the easiness of not bearing the evils alone.

111. The one who imposed the famous labors on Heracles.

112. Castor and Pollux, who were often invoked by sailors in a storm, were important members of the Spartan pantheon. What the Spartan said was probably something like "Now that I'm in trouble, you want me to involve my friends in it too."

But since both doing well and being together are choiceworthy, it is clear that being together plus a lesser good is more choiceworthy in a way than being apart plus a greater one. But since it is unclear how much being together is worth, people disagree about this from the outset and think that sharing everything together is fitted to friendship, just as they also say that eating together is more pleasant, even when having the same things. On the other hand, however, others do not wish this, since, if indeed one will take extreme cases, they would be agreeing that doing very badly together [is more pleasant] than doing very well apart.

The situation is also much the same as this as regards strokes of bad luck. For sometimes we do not wish our friends to be present or to be suffering, when they are not going to make anything better. But at other times for them to be present is a very pleasant thing. And this contrariety is also a reasonable one. For it comes about because of the things just said, that is, because, on the one hand, we simply try to shrink from contemplating a friend suffering or being in a bad state (just as in our own case), while, on the other hand, seeing a friend is pleasant (just like any other very pleasant thing), due to the cause that was mentioned, and to see him not ill, if one is ill oneself. So whichever of these is most pleasant tips the balance of wishing him to be present or not.

And this is also what happens in the case of inferior people, and comes about due to the same cause; for they are most anxious that their friends not do well nor even exist, if it is necessary for they themselves to do badly. That is why they sometimes kill their beloveds together with themselves. For they perceive their own bad state more, just as one who has also remembered that he was once doing well would perceive his bad state more than if he thought he had always been doing badly.

BOOK 8

8.1
Are Virtues Sciences?

One might raise a puzzle as to whether it is possible to use each thing both for its natural end and otherwise, and this either insofar as it is itself or, on the other hand, coincidentally—for example, if it is an eye, to see or also otherwise, to mis-see, by distorting it so that one thing appears to be two. Both of these uses, then, are because it is an eye, being used as an eye, but another use is coincidental—for example, if it were possible to sell it or eat it. It is the same way with using scientific knowledge; for one can use it truly and to err—for example, when one voluntarily writes incorrectly, one uses it as if it were just now ignorance, as it were, altering one's hand; in fact, dancing girls sometimes use their foot as a hand and it as a foot.

If, then, all virtues are sciences, it would also be possible to use justice as injustice. Therefore, a person doing unjust things will act unjustly from justice, just as he will do ignorant ones from scientific knowledge. But if this is impossible, it is evident
1246b1 that the virtues could not be sciences. Nor, if it is not possible to be ignorant from scientific knowledge, but only to err, and do the same things as if from ignorance, will
5 someone act from justice as from injustice.

But if, further, practical wisdom is a science and something true, it too will behave in the same way as it; for it would be possible to act foolishly from practical wisdom, and to make precisely the same errors as the fool does. But if the use of each thing, insofar as it is the thing, is simple, then, in acting in that way, they would also be acting in a practically wise way. But in the case of the various sciences there is another
10 controlling one that produces the distortion. But what controls the one that controls all of them? For it cannot any longer be scientific knowledge, at any rate, or understanding.[113] But then it cannot be virtue [of character] either; for it is the virtue of the ruling element that uses the virtue of the one that is ruled [not the other way around].

What science, then, is it? Or, just as lack of self-control is said to be a vice of the non-rational part of the soul, is the one lacking self-control, while still possessing
15 understanding, somehow intemperate? But if, then, when his appetite is strong, it will produce distortion, and the practical wisdom of the person who lacks self-control will rationally calculate contraries, it is clear that if there is virtue in [the appetitive part] but ignorance in the rational part, they are altered in the other way. So it will be possible to use justice in a non-just way, and practical wisdom in a bad and foolish way, so that it even [calculates] contraries; for it would be strange that whenever
20 wickedness comes to be present in the non-rational part, it will distort the virtue of the calculative part and make it ignorant, while virtue in the non-rational part, ignorance being present, will not distort it and will make it judge in a practically wise way and as it should. (And, conversely, practical wisdom in the rationally calculative
25 part [will make] intemperance in the non-rational part act temperately—which is precisely what self-control seems to do.) So there will also be [acting] in a practically wise way from ignorance.

These results are strange, especially that of behaving in a practically wise way from ignorance; for we do not see this in any of the other cases, as, for example, [a case
30 where] intemperance distorts medical and grammatical knowledge,[114] but not ignorance, if it is the contrary, because there is no excess present in it, but rather virtue, in general, is related to vice in this way. For in fact the just person is capable of all that the unjust one is, and in general incapacity is included in capacity.

So it is clear that, at the same time, people are practically wise and the states
35 of their non-rational part are good, and the Socratic view, that nothing is stronger than practical wisdom, is correct. But his saying that it is scientific knowledge is not

113. Reading ἢ νοῦς.
114. *NE* 1140b12–16, *Pol.* 1287a32–b3.

correct; for practical wisdom is a virtue, not scientific knowledge, but another kind of knowledge.

8.2
Luck and Happiness

Since not only do practical wisdom and virtue produce doing well in action, but we say too that lucky people do well, as if good luck also produces doing well, and the **1247^{a}1**
other things that scientific knowledge does, we must therefore investigate whether it is by nature that one person is lucky, another unlucky, or not, and how things stand on these matters. For that some people are lucky is something we see; for, though foolish, they accomplish many things correctly where luck is in control, and further, even in cases where a craft exists, but where in fact there is much luck involved—for 5
example, in generalship and in navigation. Are people like this, then, due to some state? Or are some people doers of lucky actions not due to being of a certain sort? For as things stand, people think that some are lucky by nature, and that nature makes people be of a certain sort, and that they are different straight from birth: just as some people are blue-eyed and others dark-eyed, due to this part being of this sort, so too 10
some are lucky, others unlucky.

For that they do not accomplish things correctly due to practical wisdom is clear; for practical wisdom is not non-rational, but has a reason because of which it acts the way it does, while the lucky could not say what the cause of their accomplishing things correctly is (for then it would be due to a craft). Further, they are manifestly foolish, not because they are so about other things (for there would be nothing 15
strange in that—for example, Hippocrates was a geometer, but seemed stupid and foolish about other things, and so lost a lot of money to the customs officers in Byzantium), but rather because in the very areas in which they are lucky, they are foolish. For as regards navigation, it is not the cleverest who are lucky, but rather it is 20
like in throwing dice, where the one gets nothing, while the other throws in accord with his being by nature lucky.

Or is it due to being loved, as they say, by a god, and is the correct accomplishment of things due to something external? For example, a badly built ship often sails better, although not because of itself, but because it has a good navigator. Does the 25
lucky person, in this way, have a daimonic thing as his good navigator? But it would be strange for a god or a daimon to love someone of that sort rather than the best and most practically wise person.

If, then, it is necessary for someone to accomplish things correctly either by nature, or by understanding, or by [divine] protection, and it is not two of these, it would be by nature that the lucky are lucky.

But surely nature is the cause of what is always in the same way or what holds for the most part, while luck is the contrary. If, then, to be successful in accomplishing 30

things correctly in a way that goes contrary to reasonable expectation seems to be characteristic of luck, but if indeed having good luck is due to luck, its cause would not be the sort of thing that is the cause of what is always the same or holds for the most part. Further, if it is because of being of such-and-such a sort that one is successful or unsuccessful in accomplishing things correctly (as it is because he is blue-eyed that he is not sharp-sighted[115]), it is not luck that is the cause but nature. Therefore, he is not lucky but, as it were, naturally gifted. So one would have to say this, that those that we say are lucky are not so because of luck. Therefore, they are not really lucky; for the lucky ones are those for whom luck is a cause of good things.

1247b1

But if this is so, will luck not exist at all, or will it exist but not be a cause? But in fact it is both necessary that it exist and be a cause. Therefore, it will be a cause of good or bad things for certain people. But if we are to remove it altogether and say that nothing is due to luck, but that we, though there is another cause, because we do not see it, say that luck is the cause (which is why in defining luck people posit that it is a cause that [appears to be] non-rational to human rational calculation, on the supposition that it is a certain nature), this would be another problem.

But since we see some people being lucky just once, why would they not also accomplish things correctly again and again because of the same thing? (For of the same thing the same thing is the cause.) This, therefore, will not be a matter of luck. But whenever the same thing results from causes that are indefinite and indeterminate, the result will be good or bad, but there will not be scientific knowledge of it through experience, since otherwise certain people would have learned to be lucky, or else indeed all the sciences, as Socrates said,[116] would be sorts of good luck. What, then, prevents things of this sort from often happening in succession to someone, not because he is of such-and-such a sort, but like being always blessed [with good luck] in throwing dice?

But now what? Won't there, then, be some impulses present in the soul that stem from rational calculation, and others that stem from non-rational desire? And are the latter not prior? For if the impulse caused by appetite for the pleasant, that is, the desire, exists by nature, then by nature, at any rate, all would proceed toward the good. If, then, certain people are naturally gifted (as singers without the scientific knowledge of how to sing are well endowed by nature in this way) and are impelled without reason in the way that nature naturally does, and have an appetite for what one should, when one should, and as one should, these people will accomplish things correctly, even if they are in fact foolish and without reason, just as the others will sing well though they are not capable of teaching it. People of this sort, who, without reason, for the most part accomplish things correctly, are lucky. Therefore, the lucky people would be so by nature.

Or is good luck said of things in many ways? For some things are done due to impulse and to deliberately choosing to do them, while others are not, but quite the contrary. Even in those cases in which people seem to have rationally calculated

115. *GA* 779b34–780a14.

116. Plato, *Euthydemus* 279d.

badly, we say that their accomplishing things correctly was also a matter of luck; and, again in these cases, if they wished for another and lesser good than they got. Therefore, it is possible for the latter people to be lucky because of nature; for their impulse and desire, being for the thing they should, did accomplish things correctly, though their rational calculation was silly. And for those in this position, whenever their rational calculation seems not to be correct, their appetite, being the cause of it, saved them by being correct by luck (although sometimes someone reasons thusly because of appetite and is unlucky). But then in the other cases how will good luck be in accord with a naturally good disposition of desire and appetite? But surely either good luck here and in the other cases is the same, or else there are several sorts of good luck, and luck is twofold.

But since we see that some people are lucky contrary to all the sciences and all correct rational calculations, it is clear that what would be the cause of good luck is something else. But is that good luck or not? If a person has an appetite for what one should and when one should, human rational calculation, at any rate, could not be the cause of this; for that for which the appetite is natural, at any rate, is certainly not altogether without reason, but does get destroyed by something. He seems, then, to be lucky, because luck is a cause of things that are contrary to reason, and this case is contrary to reason; for it is contrary to scientific knowledge and the universal. But, as looks to be the case, it is not due to luck, though it seems to be due to it. So this argument does not prove that good luck is by nature, but rather that not all those who seem to be lucky accomplish things correctly because of luck, but that some do so because of nature. Nor does it prove that luck is in no way the cause of anything, but rather that it is not the cause of all the things it seems to be the cause of.

One might, however, raise a puzzle about this, as to whether luck is the cause of this very thing, having an appetite for what one should and when one should. Or in this way, at any rate, will it be the cause of everything? For it will even be the cause of understanding and deliberating; for one certainly does not deliberate after having deliberated about it, and having in turn deliberated about that, but there is a starting-point; nor does one understand, after having understood before understanding, and so on without limit. Therefore, the understanding is not the starting-point of understanding, nor is deliberation the starting-point of deliberation. What else could this be, then, except luck? So everything is due to luck.

Or is there some starting-point with no other external to it, which, because it is itself of this sort, is capable of doing this sort of thing? This is what we are seeking: what the starting-point of movement in the soul is. It is clear, then, that just as in the universe, so there too, [the] god moves everything. For the divine thing in us in a way moves everything. Of reason, however, the starting-point is not reason, but something superior. But what except [the] god is superior even to scientific knowledge? For virtue is an instrument of the understanding.[117]

117. 1246ᵇ12.

And it is because of this, as I said earlier, that people are called "lucky" who, if they are impelled to, accomplish things correctly, though they are non-rational. And for them it is not advantageous to deliberate; for they have the sort of starting-point that is greater than understanding and deliberation (while those who have reason do not have this) and are divinely inspired, but cannot [deliberate]. For though non-rational they are successful. Also, the prophesizing of practically wise and theoretically wise people is quick, and the only thing it must not receive is the prophesizing based on reason. But in some people it is due to experience and in others due to habit, in place of the use of examination, and these prophesizings are due to the god; and this sees well what will be and what is, especially in those whose reason is released in this way. That is why passionate people also have vivid dreams; for the starting-point seems to be stronger because reason is released, just as blind people remember better when released from their relationship with visible things, because what does the remembering is stronger.

It is evident, then, that there are two forms of good luck, the one divine (which is why the lucky person seems to be correct because of a god, and this is the one who in accord with impulse tends to be correct), while the other is the one who goes contrary to impulse. Both are non-rational. And the former is rather a continuous sort of good luck, while the latter is not continuous.

8.3
Noble-Goodness, Complete Virtue, and Correct Reason

About each particular virtue we have spoken previously.[118] But since we have determined the capacity of each of them separately, we must also define precisely the virtue composed of them, which we have already called "noble-goodness."[119] That it is necessary, then, for anyone who will truly get this title to have the particular virtues is evident. For it cannot be otherwise in other cases either; for no one is healthy in his body as a whole, but not in any part of it; rather, it is necessary for all, most, or the most controlling parts[120] to be in the same state as the whole.

Being good and being noble-and-good are different not only in name but also intrinsically. For of all goods, the ones choiceworthy for their own sake are ends. But of these the noble ones are all those that are praiseworthy because of themselves. For these are the ones that the actions due to which are praiseworthy and that are also praiseworthy themselves—both justice itself and just actions, and temperate actions (for temperance too is praiseworthy). But health is not praiseworthy (for neither is

118. About the virtues of character in *EE* 3 and 4 (= *NE* 5) and about those of thought in *EE* 5 (= *NE* 6).
119. *NE* 1124a4, 1179b10.
120. *GA* 776b5–6.

the work it does), nor is [acting] strongly (for neither is strength). They are good, but they are not praiseworthy. Likewise, this is also clear by induction in other cases.

A good person is one for whom things that are good by nature are good; for the fought-about goods and the goods believed to be the greatest ones (honor, wealth, virtues of body, strokes of good luck, and capacity), though good by nature, can be harmful to certain people because of their states. For a person who is foolish, or is unjust or intemperate, would get no benefit from making use of them, just as a sick person would get none from making use of the nourishment of a healthy one, or a weak, deformed one of the adornments of a healthy, whole one. But a person is noble-and-good because good things that are noble because of themselves belong to him, and because he is a doer of noble actions also for their own sake. And noble things are both the virtues and the works that are due to virtue.

There is a certain political state [of character], however, such as the Spartans and others of this sort have. This is a state of this sort. For there are people who think that they should possess virtue, but for the sake of the things that are by nature good. That is why they are good men[121] (for the natural goods are good for them), but they do not possess noble-goodness. For the things that are noble because of themselves do not belong to them, while those to whom they do belong because of themselves and who deliberately choose them are noble-and-good; and not only these things, but also the ones not noble by nature, but rather good by nature, are noble for these people. For things are noble whenever what people do them for the sake of, and choose them for the sake of, is noble. That is why the things that are good by nature are noble for the noble-and-good person; for the just is noble, and this is the just in accord with worth; and this person is worthy of these things. And what is appropriate is noble. And these things—wealth, good breeding, capacity—are appropriate for this person. So for the noble-and-good person the same things are both advantageous and noble. But for ordinary people there is a discordance here; for things that are unconditionally good are not also good for them, though they are good for the good person. And for the noble-and-good person they are also noble; for he does many noble actions because of themselves. But the person who thinks that he should possess the virtues for the sake of external goods does noble actions [only] coincidentally. Noble-goodness, then, is complete virtue.

Also as regards pleasure, it has been stated[122] what sort of thing it is and in what way it is good, and that the things that are unconditionally pleasant are also noble and the unconditionally good ones pleasant. And pleasure does not come about except in action. That is why the truly happy person will also live most pleasantly, and why it is not pointlessly that human beings think this.

But since there is a certain defining mark also for the doctor, by reference to which he judges what is a healthy body and what is not, and up to what point each thing

121. Reading ἀγαθοὶ for the mss. ἄγριοι ("wild men").
122. 1237ᵃ6–7, *NE* 1152ᵇ25–1153ᵃ35, 1153ᵇ9–12, 1154ᵇ15–31.

must be produced (and if it is produced well the body is healthy, but no longer so if it is too little or too much); in a similar way too for the excellent person, as regards actions and choices that are good by nature but not praiseworthy, there must be a certain defining mark for the possession and choice—and as regards the avoidance of abundance or scarcity—of wealth and of other results of good luck. Previously, it was said[123] that this [defining mark] was "as reason [prescribes]," but this is as if someone were to say in matters of nourishment that it is "as medicine and its reason [prescribe]." It is true, but not perspicuous.

Just as in other areas, then, one must live by reference to the ruling element, and by reference to the state and activity of the ruling element, as a slave by reference to that of his master, and each thing by reference to its own ruling starting-point. But since a human being too is by nature composed of a ruler and a ruled, each one would also have to live by reference to its own proper ruling starting-point. But this is twofold; for medicine and health are ruling starting-points in distinct ways (the former is for the sake of the latter). This is the way it is as regards what contemplates. For the god is not a prescriptive ruling starting-point, but that for the sake of which practical wisdom prescribes, since [the god], at any rate, is in need of nothing. (The for-the-sake-of-which is twofold. The distinction has been made elsewhere.[124]) Whatever choice and possession, then, of natural goods—whether goods of the body, wealth, friends, or other goods—will most of all produce the contemplation of the god, this is the best one, and this the noblest defining mark; and whatever choice, whether because of deficiency or because of excess, prevents serving the god and contemplation—this is a bad one. And this holds for the soul, and this is the best defining mark, to perceive as little as possible the other part of the soul, insofar as it is such.

What the defining mark is for noble-goodness, then, and what the target is for the unconditional goods, let it be stated thus.

123. E.g., 1220b28, 1222a34, 1233b6.

124. *Ph.* 194a35–36, *DA* 415b2–3, *Met.* 1072b1–4.

POLITICS*

BOOK 1

1.1
The City and Its Rule

Since we see every city to be a sort of community, and every community to be composed for the sake of some good (for everyone does every action for the sake of what seems to be good), clearly, then, while every community aims at some good, the community that has the most control of all, and encompasses all the others, aims both at the good that has the most control of all and does so to the highest degree. And this community is the one called a "city," the community that is political. **1252a1**

Those who think[1] that the positions of politician, king, household manager, and master [of slaves] are the same are not correct. For they think that each of these differs with regard to large or small number, but not in form—for example, if someone rules few people, he is a master, if more, a household manager, if still more, he has the position of politician or king—the assumption being that there is no difference between a large household and a small city. And as for the positions of politician and king, they say that someone who is himself in charge has the position of king, while someone who, in accord with the reasons belonging to this sort of science, takes his turn at ruling and being ruled has the position of politician. But these claims are not true.

What is meant will be clear, if we investigate the matter in accord with our normal method of inquiry. For as in other cases, a composite must be analyzed until we reach things that are incomposite (for these are the smallest parts of the whole), so too it is by investigating the parts of which a city is composed that we will see better both how these differ from each other, and whether or not it is possible to gain some craft-like expertise concerning each of the things we have mentioned.

* Translated by C. D. C. Reeve. Text: W. D. Ross, *Aristotelis Politica* (Oxford, 1957).

1. E.g., Plato, *Statesman* 258e–261a.

1.2
The Emergence and Naturalness of the City

If we were to see how these things grow naturally from the start, we would in this way,
25 in this case as in the other ones, get the best theoretical grasp on them. First, then, those who are incapable of existing without each other necessarily form a couple, as female and male do for the sake of procreation (they do not do so from deliberate choice, but, as in the case of the other animals and plants, because the urge to leave behind something of the same sort as themselves is natural), and as what rules by
30 nature and what is by nature ruled do for the sake of preservation. For if something is capable of looking ahead by using its thought, it is by nature a ruler and by nature a master, while whatever can labor by using its body is ruled and is by nature a slave. That is why the same thing is advantageous for both master and slave.

1252b1 By nature female is distinguished from slave. For, unlike the blacksmiths who make the Delphian knife, nature produces nothing in a stingy way, but instead makes one thing for one [thing]; for each one of the instruments will be completed best if it serves for one work rather than many. Among barbarians, however, a woman and a
5 slave occupy the same position. The cause of this is that they have no element that is by nature a ruler, but rather their community is that of male and female slave. That is why the poets say "It is reasonable for Greeks to rule barbarians,"[2] on the supposition that a barbarian and a slave are by nature the same.

From these two communities, then, the household was first to arise, and Hesiod
10 was correct when he said in his poem, "First and foremost a house, a woman, and an ox for the plow."[3] For to poor people an ox takes the place of a servant. The community composed to satisfy everyday needs, then, is the household in accord with nature, whose members are called "meal-sharers" by Charondas and "manger-sharers" by Epimenides the Cretan.

15 The first community, consisting of several households, for the sake of satisfying needs other than everyday ones, is the village. And above all the village in accord with nature seems to be a colony of the household, consisting as it does of what some[4] have called "sharers of the same milk," sons and the sons of sons. That is why cities were at first ruled by kings, as [barbarian] nations still are; for those who came together were
20 living under kingly rule; for every household is ruled by the eldest as a king. And so the same holds in the colonies, because of the kinship [of the villagers]. This is what Homer is describing when he says: "Each one lays down the law for his own wives and children."[5] For they were scattered about, which is how people used to dwell in ancient times. And it is because of this that all people say that the gods too are ruled

2. Euripides, *Iphigenia in Aulis* 1266, 1400.
3. *Works and Days* 405.
4. Identity unknown.
5. *Odyssey* 10.114–115.

by a king, because they themselves were ruled by kings in ancient times, and some still are. And human beings model not only the forms of the gods on their own but their mode of life as well.

The community, coming from several villages, when it is complete, is the city, once it has already reached (one might almost say) the limit of total self-sufficiency. It comes to be for the sake of living, but it exists for the sake of living well. That is why every city exists by nature, if indeed the first communities also do. For this one is their end, and nature is an end; for what each thing is when its coming to be has been completed, this we say is the nature of each—for example, of a human being, of a horse, or of a household. Further, the for-the-sake-of-which—the end—is best, and self-sufficiency is both end and best.

From these considerations, then, it is evident that a city is among the things that **1253ª1** exist by nature, that a human being is by nature a political animal, and that anyone who is without a city, not by luck but by nature, is either a wretch or else better than human, and, like the one Homer condemns, he is "clanless, lawless, and homeless";[6] for someone with a nature of this sort has at the same time an appetite for war, like an isolated piece in a game of checkers.

It is also clear why a human being is more of a political animal than any bee or any other herd animal. For nature does nothing pointlessly, as we say, and the human being alone among the animals has speech. A voiced sound is a sign of what is pleasant or painful, which is why it is also possessed by the other animals (for their nature does extend this far, to having the perception of pleasure and pain and signifying them to each other). But speech is for indicating what is advantageous or harmful, and so too what is just or unjust; for this is special to human beings, in comparison to the other animals, that they alone have perception of the good and the bad, the just and the unjust, and the rest. And it is community in these that makes a household and a city.

Also the city is prior in nature to the household and to each of us individually. For it is necessary for the whole to be prior to the part; for if the whole body is put to death, there will no longer be a foot or a hand, except homonymously, as one might speak of a stone "hand" (for, once dead, the hand will be like that). But everything is defined by its work and by its capacity, so that when they are no longer in that condition they must not be said to be the same things but homonymous ones. It is clear, then, that the city both exists by nature and is prior in nature to the individual; for if an individual is not self-sufficient when separated, he will be in a similar state to that of the other parts in relation to the whole. And anyone who cannot live in a community with others, or who does not need to because of his self-sufficiency, is no part of a city, so that he is either a wild beast or a god.

By nature, the impulse toward this sort of community exists in everyone; but the person who first put one together was also the cause of very great goods. For just as when completed a human being is the best of the animals, so when separated

6. *Iliad* 9.63–64. Homer is describing a man who "loves fighting with his own people."

from law and judicial proceeding he is worst of all. For injustice is harshest when it possesses weapons, and a human being grows up possessed of weapons for practical wisdom and virtue to use, which may be used for absolutely contrary purposes. That is why he is the most unrestrained and most savage of animals when he lacks virtue, as well as the worst as regards sex and food. But justice is something political; for justice is a political community's order, and justice[7] is judgment of what is just.

1.3
The City's Parts; Household, Master, and Slave

1253b1 Since it is evident from what parts the city is composed, it is necessary first to speak about household management; for every city is composed of households. And the parts of household management correspond in turn to the parts of which the household is composed, and a complete household is composed of slaves and free people. But since one must first inquire about each thing in terms of its smallest parts, and the primary and smallest parts of a household are master and slave, husband and wife, and father and children, one must investigate these three things to see what each of them is and what sort of thing each must be. The three in question are mastership, "marital" science (for the union of woman and man is nameless), and, third, "procreative" science (for this too has not been given a name that is special to it). Let these three that we mentioned stand. But there is also a part, which some believe to be identical to household management, and others believe to be its largest part; one must get a theoretical grasp on how things stand with it too. I mean what is called "the craft of wealth acquisition."

But let us first discuss master and slave in order that we may see the things that are related to necessary use, and also whether we can acquire something in the way of knowledge about these things that is better than what it is supposed at present. For some people believe that mastership is a sort of science, and that household management, mastership, politics, and kingship are all the same, as we said at the start.[8] But others believe that it is contrary to nature to be a master;[9] for it is by law that one person is a slave and another free, while by nature there is no difference between them. That is why to be a master is not just either; for it is based on force.

1.4
The Nature of the Slave

Since property is part of the household, the craft of property acquisition is also a part of household management; for it is impossible either to live or to live well without

7. Reading ἡ δὲ δίκη.
8. 1252a7–16.
9. E.g., Alcidamas of Elaea.

the necessities. So, just as it is necessary for the specialized crafts to have their proper instruments if they are going to do their works, the same applies to a household manager. Among instruments, however, some are inanimate and some are animate—for example, for the ship's captain a rudder is an inanimate instrument, while his lookout is an animate one; for in the crafts an assistant is in the form that consists of instruments. So too a piece of property is an instrument for living, and property [in general] a number of instruments of this sort, a slave is a sort of animate piece of property, and all assistants are like instruments for [using] instruments. For if each instrument could do its own work on command or by anticipating instructions, and if—like the statues of Daedalus or the tripods of Hephaestus (which the poet describes as having "entered the assembly of the gods of their own accord"[10])—shuttles wove cloth by themselves, and plectra played the lyre, an architectonic craftsman would not need assistants and masters would not need slaves.

What are commonly said to be instruments are productive instruments, while a **1254^{a}1** piece of property is a practical one; for something comes from a shuttle beyond the use of it, but from a piece of clothing or a bed only the use comes. Further, since production and action differ in form, and both need instruments, their instruments must differ in the same way as they do. But life is action, not production. That is why a slave is an assistant in the things related to action. And something is said to be a piece of property in the same way as it is said to be a part. For a part is not just a part of another thing, but is wholly that thing's, and the same also holds of a piece of property. That is why a master is just his slave's master, not simply his, while a slave is not just his master's slave, but wholly his.

From these considerations it is clear what the nature and capacity of a slave are. For anyone who, though human, is by nature not his own but someone else's is by nature a slave. And a human being is someone else's when, though human, he is a piece of property, and a piece of property is an instrument that is for action and separate [from its owner].

1.5
Natural Slaves (1)

But whether anyone is like that by nature or not, and whether it is better and just for anyone to be a slave or not (all slavery being, on the contrary, against nature), must be investigated next. And it is neither difficult to get a theoretical grasp on the answer by argument nor to learn it from what actually happens. For ruling and being ruled are not only necessary, they are also advantageous, and some things are set apart straight from birth, some to rule, others to be ruled. And there are many forms of rulers and ruled, and rule over the better ruled is always better—for example, rule over human

10. Homer, *Iliad* 18.376.

beings is better than rule over wild beasts; for a work that is completed by something better is a better work, and where one thing rules and another is ruled, there is a certain work belonging to these; for in whatever is composed of a number of things, whether continuous with each other or discontinuous, and becomes one communal thing, a ruler and a ruled are always seen in all of them, and this is present in animate beings on the basis of their entire nature; for even in things that do not share in living some rule exists—for example, in a harmony.[11] But these issues presumably lie far outside our investigation.

In the first place, a living being is composed of soul and body, and of these, by nature, the former is the ruler, the latter the ruled. And one must investigate what is natural in things whose condition is in accord with nature, not in the corrupted ones. That is why the human being to get a theoretical grasp on is one that is in the best possible condition, both of soul and of body, since in him this is clear; for in depraved people, and those in a depraved condition, the body will often seem to rule the soul, because their condition is base and in disaccord with nature.

But it is, as we were saying, in a living being that one can first get a theoretical grasp on both the rule of a master and political rule; for the soul rules the body with the rule of a master, while the understanding rules desire with political rule or kingly rule. In these cases, it is evident that it is in accord with nature and advantageous for the body to be ruled by the soul, and for the affective part to be ruled by the understanding and the part that has reason, while if the relation were equal or reversed it would be harmful to all concerned. And again in the case of a human being and the other animals the same holds; for domestic animals are by nature better than wild ones, and it is better for all of them to be ruled by human beings; for in this way they secure their preservation. Further, the relation of male to female is that of what is better by nature to what is worse, and that of ruler to ruled. And it must be the same way in the case of all human beings.

Those people, then, who are as different [from others] as body is from soul or wild beast from human being (and they are in this condition if their work is to use their bodies, and this the best thing to come from them)—those people are by nature slaves, and it is better for them to be ruled with this rule, if indeed it is also better for the other things mentioned. For he is by nature a slave who is capable of belonging to someone else, belongs to someone else because of this, and shares in reason to the extent of perceiving it but not to the extent of having it himself. For the other animals assist not because they perceive[12] the reason but because of feelings. Also, the difference in the use made of them is small; for in relation to the necessities bodily help comes from both, both from slaves and from domestic animals.

Nature tends indeed to make the bodies of free people and slaves different, the latter strong enough to be used for necessities, the former upright in posture and

11. The reference is to the *mêsê* or *hêgemôn* ("leader"), which is the dominant note in a chord.
12. Reading αἰσθανόμενα.

useless for doing that sort of work, but useful for political life—which is itself divided into what is useful for war and what is useful for peace. But the contrary also often happens, some have the bodies of freemen, while others have the souls. Since this, at any rate, is evident: if people were to become in body alone as distinguished as the statues of the gods, everyone would say that those who fell short deserved to be their slaves. And if this is true in the case of the body, it is even more just to make this distinction in the case of the soul. But it is not as easy to see the beauty of the soul as it is to see that of the body.

It is evident, therefore, that by nature some people are free and others are slaves, for whom slavery is both advantageous and just. **1255^{a}1**

1.6
Natural Slaves (2)

But that those who make the contrary claim are also correct in a way is not difficult to see. For someone is said to be being ruled as a slave, or to be a slave, in two ways. For by law too a person can be a slave or be ruled as a slave; for the law [in question] is a sort of agreement by which what is conquered in war is said to belong to the conquerors. Against the justice of this, then, many of those versed in the law bring a writ of illegality, analogous to that brought against a [legislative] speaker, on the grounds that it is a terrible thing if what is overcome by force is going to be the slave of, and ruled by, what is able to exert force and is superior in power. And some hold the latter view, others the former, even among the wise.

The cause of this dispute, and what produces a going back-and-forth in the arguments, is that in a way virtue, when it is equipped with resources, is most able to use force, and what conquers is always superior in something good, so that it seems that there is no force without virtue, the dispute being only about justice. For because of this view one side believes that justice is goodwill,[13] while the other believes that justice is precisely this—that the stronger rule. At any rate, if these arguments are left aside, the other arguments have neither strength nor anything to persuade us that the one who is better in virtue should not rule, that is, be master.

Some people cleave exclusively to what they think is a sort of justice (for the law is something just), and maintain that enslavement in war is just. But at the same time they say that it is not just; for it is possible for wars to be started unjustly, and there is no way in which someone would say that the person who does not deserve to be in a condition of slavery is a slave—otherwise, it could turn out that those believed to be the most well-bred are slaves or the children of slaves, if any of them happen to be taken captive and sold. That is why indeed the people who hold this view are not willing to say that these are slaves, but only that barbarians are. And yet, in saying

13. Reading εὔνοια.

this, what they are seeking is nothing other than what is by nature a slave—which is precisely what we spoke about at the start; for they have to say that some people are slaves everywhere, others nowhere.

It is the same way with good breeding; for people think of themselves as well-bred not just when they are in their own country, but wherever they are, while they think of barbarians as well-bred only at home, on the supposition that it is one thing to be unconditionally well-bred and free, and another to be so but not unconditionally—as Theodectes' Helen does when she says: "Sprung from divine roots on both sides, who would think that I deserve to be called a 'hired servant'?"[14] But when people say this, it is by nothing but virtue and vice that they are defining slave and free, well-bred and ill-bred. For they think that in just the way that human comes from human, and wild beast from wild beast, so too good people come from good ones. But, though nature often tends to do this, it is nonetheless unable [always] to do so.

It is clear, then, that there is some reason for the dispute and that the one lot are not always slaves by nature nor the other free. But it is also clear that in some cases there is a distinction of this sort—cases where it is advantageous and just[15] for the one to be ruled as a slave and the other to rule as a master, and where the one should be ruled and the other should rule with the rule that is natural for him to exercise (so that he is in fact ruling as a master), and where misrule is disadvantageous to both. For the same thing is advantageous for both part and whole, body and soul, and a slave is a sort of part of his master—a sort of living but separate part of his body. That is why there is in fact a sort of mutual advantage and mutual friendship for such masters and slaves as deserve to be by nature so related. When their relationship is not that way, however, but is in accord with law, and they have been subjected to force, the contrary holds.

1.7
Mastership and Slavecraft

It is also evident from these considerations that the rule of a master and the rule of a politician are not the same, and that the sorts of rule are not all the same as each other either, as some people claim. For one is rule over people who are by nature free, the other over slaves. Rule by a household manager is a monarchy (for every household has one ruler); rule of a politician, one the other hand, is rule over people who are free and equal.

Someone is said to be a master not in virtue of his scientific knowledge but in virtue of being such-and-such a sort of person. The same is true of both slave and free. Nonetheless, there could be such a thing as mastership or slavecraft—for example, of

14. Fr. 3 Nauck.
15. Reading καὶ δίκαιον.

the sort that was taught by the man in Syracuse,[16] who, for a fee, used to teach slave boys their day-to-day services. Lessons in such things as these might well be extended to include cooking and other services of that kind. For different slaves have different works, some of which are more estimable, others more concerned with providing the necessities—"Slave before slave, master before master," as the proverb says.[17]

All sciences of this sort, then, are the business of slaves, while mastership is the science of using slaves. For being a master does not consist in the acquiring of slaves but in the using of them. But there is nothing grand or dignified about this science; for what the slave needs to have scientific knowledge of how to do is what the master needs to have scientific knowledge of how to prescribe. That is why, for those who have the resources not to bother with such things, a steward takes on this office, while they themselves engage in politics or do philosophy. As for the science of acquiring slaves (that is, of doing so justly), it is different from both of these, and is a sort of warfare or hunting.

As regards master and slave, then, let the distinctions be made in this way.

1.8
Property Acquisition and Household Management

Let us now get a general theoretical grasp on all property and the craft of wealth acquisition, in accord with the way laid down,[18] since in fact a slave has turned out to **1256ᵃ1** be a part of property. The first puzzle one might raise is whether the craft of wealth acquisition is the same as household management, or a part of it, or an assistant to it. And if it is an assistant, whether it is in the way that shuttle-making is to weaving, or in the way that bronze-smelting is to statue-making; for these do not assist in the same way, but rather the first provides instruments, while the second the matter. (By "the matter" I mean the underlying subject from which a certain product is made—for example, wool for the weaver and bronze for the statue-maker.)

But it is clear that household management is not the same as the craft of wealth acquisition (for to the former it belongs to use resources, to the latter to provide them). For otherwise what science will there be that uses what is in the household, except that of household management? But whether the craft of wealth acquisition is a part of household management or a science of a distinct form is a matter of dispute; for if it belongs to someone who possesses the craft of wealth acquisition to get a theoretical grasp on the various sources of wealth and property, and property[19] and wealth include many parts, [one must investigate] first whether farming—and, in

16. Identity unknown.
17. Philemon, Fr. 54 Kock.
18. I.e., analysis into parts. See 1252ᵃ17–23, 1253ᵇ1–8.
19. Reading ἡ δὲ κτῆσις.

universal terms, the supervision and acquisition of nourishment—is a part of wealth acquisition or some distinct kind of thing.

But there are in fact many forms of nourishment, and that is also why the ways of life of both animals and human beings are many; for it is impossible to live without nourishment, so that differences in nourishment have produced different ways of life among the animals. For some wild beasts live in herds and others live scattered about, whichever is advantageous for getting their nourishment, because some of them are carnivorous, some herbivorous, and some omnivorous. And so with a view to their convenience and their preference in these matters, nature has made their ways of life different. And since it is not the same things that are naturally pleasant to each, but rather different things to different ones, among the carnivores and herbivores themselves the ways of life are different.

The same is also true of human beings. For their ways of life differ greatly. The most idle are herders; for they—without effort and while at leisure—get their nourishment from their domestic animals. Although, when it is necessary for their herds to change pasture, they too have to move around with them, as if they were farming a living farm. Others live from hunting, and different sorts from different sorts of it: some from raiding; some—those who live near lakes, marshes, rivers, or a suitable sort of sea—live from fishing; and some off birds or wild beasts. But the human kind that is most numerous lives off the land and off cultivated crops.

The ways of life, then—at any rate, those that have the work they do arise naturally[20] and do not provide nourishment through exchange or commerce—are pretty much these: nomadic, raiding, fishing, hunting, farming. But some people live pleasantly by mixing together several of these, supplementing their mode of life where it happens to be deficient with regard to self-sufficiency—for example, some live both a nomadic and a raiding life, others, both a farming and a hunting one, and similarly in the case of the others, each passing their time in the way need, together with other things, necessitates.

Property of this sort, then, is manifestly given by nature itself to all living things both immediately from when they are first generated, and so too when they have completely developed. And in fact some animals produce at the start, together with their offspring, enough nourishment to last the latter until such time as it is able to get it for itself—for example, those that produce grubs or eggs. Animals that give birth to live offspring, on the other hand, carry nourishment for their offspring in their own bodies for a certain period—the natural substance called "milk." It is likewise clear, then, in the case of developed things too, that one must think both that plants are for the sake of animals, and that the other animals are for the sake of human beings, domestic ones both for using and eating, and if not all, nonetheless most, wild ones for nourishment and other sorts of support, so that clothes and other instruments may be got from them. If, then, nature makes nothing incomplete and

20. 1257a19–21.

nothing pointlessly, it must be that nature made all of them for the sake of human beings. That is why even warfare (for hunting is a part of it), will in a way be by nature a craft of property acquisition—one that should be used not only against wild beasts but also against those human beings who are naturally suited to be ruled but unwilling to be, on the supposition that this sort of warfare is by nature just.

One form of craft of property acquisition, then, is by nature a part of household management, in that either there must be available, or it itself must arrange to make available, a store of what is both necessary for living and useful to the community of city or household. At any rate, true wealth seems to consist of things of this sort. For self-sufficiency in this sort of property, with a view to living the good life, is not unlimited, as Solon in his poetry says it is: "No boundary to wealth has been laid down for human beings."[21] For one has been laid down just as in the other crafts; for there is no instrument of any craft that is unlimited in quantity or size, and wealth is a collection of instruments for household management and politics.

It is clear, then, that there is a natural sort of craft of property acquisition for household managers and politicians, and what the cause of this is.

1.9
Wealth Acquisition and the Nature of Wealth

But there is another kind of craft of property acquisition, which they most of all call—and justly so—"the craft of wealth acquisition." It is because of it that wealth and property seem to have no limit. And many people think that the craft of wealth **1257a1** acquisition is one and the same as what was spoken about, because the two are close neighbors. But it is neither the same as what was said nor all that far from it. One of them exists by nature, while the other does not exist by nature, but comes more from a sort of experience and craft knowledge.

Concerning the latter, let us take the following as our starting-point. For each piece of property has two uses, both of which are uses of it intrinsically, but not uses of it intrinsically in the same way. Instead, one properly belongs to the thing, while the other does not properly belong to it—for example, as regards a shoe, its use in wearing it and its use in exchange. For both are uses to which a shoe can be put; for in fact someone who exchanges a shoe, in return for money or nourishment, with someone who needs a shoe, is using the shoe insofar as it is a shoe. But this is not the use that properly belongs to it; for it did not come to exist for the sake of exchange. And it is the same way with the other pieces of property as well. For the craft of exchange applies to all of them, and first started from the natural circumstance of some human beings having more than enough of these things and less of others. (It is also clear from this that the craft of commerce does

21. Fr. 1.71 Diehl.

not by nature belong to the craft of wealth acquisition; for it was up to the point at which they had enough that it was necessary for them to engage in exchange.) It is evident, then, that in the first community, that is, the household, there is no work for exchange, but only when the community already consists of more members. For the members of the household used to share all their own things, while those in separate households in turn shared many other things, and it was necessary to make a trade of these in accord with their needs, as many barbarian peoples still do, through exchange. For they exchange useful things for other useful things, but nothing more than that—for example, they take and give wine in return for wheat, and so on with everything else of this sort.

This sort of craft of exchange, then, is neither contrary to nature nor is it any form of craft of wealth acquisition; for it existed as a replenishment of a self-sufficiency that is in accord with nature. Nonetheless, the craft of wealth acquisition arose from it, and did so in accord with reason. For when supplies came from increasingly foreign sources, because of importing what was needed and exporting the surplus, the use of money had of necessity to be devised. For not all the natural necessities are easily transportable. And that is why with a view to exchange people agreed with each other to give and take something that was itself one of the useful things and that was easily adaptable to the needs of living—for example, iron, silver, and anything else of that sort. At first, its value was determined simply by size and weight, but finally people also put a stamp on it, in order to save themselves the trouble of measuring it; for the stamp was put on to signify the amount.

1257b1 Once money was devised, from necessary exchange the second of the two forms of crafts of wealth acquisition arose, the craft of commerce. At first, it was presumably a simple affair, but then through experience it became more of a craft of how and from what sources the greatest profit could be made through exchange. That is why it seems that the craft of wealth acquisition is most of all concerned with money, and that its work is to be able to get a theoretical grasp on the sources from which a quantity of wealth will come; for it is productive of wealth and money. For wealth in fact is often assumed to be a quantity of money, because this is what the craft of wealth acquisition and the craft of commerce are concerned with.

But sometimes, contrariwise, money seems to be empty trash and to exist entirely by convention and not by nature at all, because, when changed by its users, it has no value and is useless for acquiring any of the necessities, and often someone who is rich in money will be unprovided with the nourishment that is necessary. And yet it is absurd for something to be wealth if someone well provided with it will die of hunger, like Midas in the fable, when everything set before him turned to gold in answer to his own greedy prayer. That is why people seek another notion of what wealth and the craft of wealth acquisition are, and correctly so. For the craft of natural wealth acquisition and natural wealth are of another sort, and it is [a part of] household

management, while the craft of commerce is productive of goods, not in every way, but through their exchange. And it seems to be concerned with money; for money is the element and limit of exchange.

And the wealth that derives from this sort of craft of wealth acquisition is unlimited. For just as the craft of medicine aims at unlimited health, and each of the crafts aims to achieve its end in an unlimited way (for this is what they most of all wish to do), while the things that further the end are not unlimited (for the end is the limit of all of them), so too of this sort of craft of wealth acquisition there is no limit concerning its end, but its end is wealth of this sort: the possession of money. The sort of craft of wealth acquisition that is a part of household management, on the other hand, does have a limit; for this [unlimited wealth] is not the work of household management. That is why, in one way it appears to be necessary for all wealth to have a limit, and yet, if we look at what actually happens, the contrary seems true; for all acquirers of wealth go on increasing their money without limit. The cause of this is the close relation between the two. For the use, being of the same thing, goes back and forth between the two sorts of crafts of wealth acquisition. For the use is of the same property in both cases, but not with respect to the same thing. Instead, in one case the end is increase, in the other, something else. So it seems to some people that this is the work of household management, and so they end up thinking that they should either preserve the substantial amount of money they have or increase it without limit.

The cause, though, of their being so disposed is that what they take seriously is living, not living well. And since their appetite for living is unlimited, they also have an appetite for an unlimited amount of what is productive of it. But even those who do aim at living well seek what furthers bodily gratification, so that, since this too appears to depend on having property, they spend all their time acquiring wealth. And the other form of craft of wealth acquisition arose because of this. For because their gratification lies in excess, they seek the craft that is productive of the excess in gratification. And if they cannot provide it through the craft of wealth acquisition, they try to do so by means of some other cause of it, using each of the capacities not in accord with nature. For it does not belong to courage to produce wealth but to produce confidence in the face of danger, nor does it belong to generalship or medicine to do so, but rather to produce victory and health, respectively. These people, however, make all of these into the crafts of wealth acquisition, on the supposition that acquiring wealth is the end, and that everything must further the end.

The unnecessary craft of wealth acquisition, then, what it is, and what the cause is of our need of it have been spoken about, and also the necessary sort, that it is a distinct sort, that it is a natural part of household management, since it is concerned with nourishment, and that it is not unlimited like the other, but has a defining mark.

1.10
Wealth Acquisition, Household Management, Usury

It is also clear what the solution is to the puzzle raised at the start[22] about whether the craft of wealth acquisition belongs to a household manager and a politician, or whether this is not so, but wealth must rather be available to him. For just as politics does not make human beings, but takes them from nature and uses them, so too nature must provide land or sea or something else as a source of nourishment, so a household manager must manage what comes from these sources in the appropriate way. For it does not belong to weaving to make wool but to use it, and to know which sorts are usable and suitable or bad and unsuitable.

For someone might be puzzled as to why the craft of wealth acquisition is a part of household management, while the craft of medicine is not, and yet the members of a household need to be healthy, just as they need to live and have every other necessity. But since there is a way in which it does belong to a household manager and a ruler to see even to health, while in another way it does not belong to them, but rather to a doctor, so too in the case of wealth there is a way in which it belongs to a household manager to see to it, and another in which it does not belong to him but to an assistant craft. But above all, as was said previously,[23] nature must ensure that this is on hand. For it is a work of nature to provide nourishment for what is born; for the leftovers of what they are born from are nourishment for each one. That is why in all cases the craft of acquiring wealth from crops and animals is in accord with nature.

But since it is of two sorts, as we said,[24] one belonging to the craft of commerce and the other to household management, and the latter is necessary and praiseworthy, while the craft of exchange is justly blamed (for it is not in accord with nature but involves taking from each other), usury is most reasonably hated, because it gets wealth from money itself, rather than precisely what money was provided for. For money was introduced for the sake of exchange, while interest makes money itself grow bigger. That in fact is how it got its name; for offspring (*tokos*) resemble their parents, and interest (*tokos*) is money that comes from money. And so of all the sorts of wealth acquisition this one is the most against nature.

1.11
Practical Aspects of Wealth Acquisition; Monopolies

Since we have adequately determined[25] what relates to knowledge, what relates to use must be gone through. And of all things of this sort theoretical investigation is

22. 1256a3–10.
23. 1258a20–21.
24. 1256b26–39, 1257b17–23.
25. 1253b14–18.

something free, while experience is something necessary. The practically useful parts of the craft of wealth acquisition are: Being experienced with livestock—for example, with what sorts of horses, cattle, sheep, and similarly other animals yield the most profit in which places and in which ways (for one needs experience of which of these, in comparison to each other, are the most profitable breeds, and which sorts in which places; for one thrives in one place, another in another). Next, being experienced in farming, which is now divided into land planted with fruit and land planted with cereals, and being experienced in beekeeping and in the rearing of the other creatures, whether fish or fowl, from which it is possible to derive benefit. Of the craft of wealth acquisition of the most proper and primary sort, then, these are the parts.

The most important part of the craft of exchange, on the other hand, is trading, which has three parts: ship owning, transport, and marketing. These differ from each other in that some are safer, others offering greater profit. The second part is moneylending; the third is wage-earning, of which one sort involves the unrefined craftsmen, while the other involves those who have no craft knowledge and are useful with their bodies only.

A third form of craft of wealth acquisition comes between this one and the primary one; for it contains some part of the natural one and some part of the craft of exchange. It is concerned with things that come from the earth, or are extracted from the earth, that are inedible but useful—for example, logging and every sort of mining. And this now includes many kinds; for many forms of things are mined from the earth.

Each of these has now been spoken about in universal terms. And, while an exact accounting of each particular one might be useful for putting them into practice, it would be unrefined to spend one's time on it. The most craft-like of these practices are those in which there is the least luck involved; the most unrefined, those in which the body is most damaged; the most slavish, those in which the body is used the most; the most ill-bred, those least in need of virtue in addition.

But since some people have written on these issues—for example, Chares of Paros and Apollodorus of Lemnos on how to farm both grain and fruit, and others on similar issues—anyone who cares to can get a theoretical grasp on them from these. Still, the scattered things that are said about how people have succeeded in acquiring wealth should be collected. For all of them are beneficial for those who hold the craft of wealth acquisition in esteem—for example, the one about Thales of Miletus. This involved an insight related to the craft of wealth acquisition, which, though attributed to him because of his wisdom, happens to be universally applicable. People were reproaching him, indeed, because of his poverty, claiming that his philosophy was of no benefit. And the story goes that he apprehended from his astronomy that a good olive harvest was coming. So, while it was still winter, he raised a little money and put a deposit on all the olive presses in Miletus and Chios, hiring them at a low rate, because no one was bidding against him. When the olive season came and many people all of a sudden sought olive presses at the same time, he hired them out at

whatever rate he chose. He collected a lot of money, proving that philosophers could easily become rich if they wished, but that this is not what they take seriously.

Thales, then, is said to have demonstrated his own wisdom in this way. But, as we said, this sort of insight related to the craft of wealth acquisition—establishing a monopoly for oneself if one can—is universally applicable. That is why some cities also raise revenue in this way when they are in need of resources; for they create a monopoly on goods for sale. And there was a man in Sicily, who used some money that had been deposited with him to buy up all the iron from the foundries, and later, when the merchants came from their warehouses to buy iron, he was the only seller. He did not increase his prices very much, but all the same he added a hundred talents to his original fifty. When Dionysius[26] heard about this, he told the man to take his money, but on the condition that he remain in Syracuse no longer, as he had discovered ways of making money that were harmful to Dionysius' own affairs. Yet this man's insight was the same as Thales'; for each contrived to develop a monopoly for himself.

It is also useful for politicians to know about these things. For many cities need the craft of wealth acquisition and revenues of this sort just as households do, but more so. That is why indeed some people active in politics restrict their political activities to these matters alone.

1.12
The Rule of Women and Children

Since, as we saw, there are three parts to household management, one being mastership (which was spoken about previously[27]), another the science of fatherhood, and a third, marital science, [let us now speak about the other two]; for a wife and children are both ruled as free people, but not with the same mode of rule; instead, a wife is ruled in a political way, children in a kingly one; for a male, unless he is somehow composed contrary to nature, is by nature more capable of leading than a female, and someone older and complete more than someone younger and incomplete.

In most cases of political rule people take turns at ruling and being ruled, because they tend to be equal by nature and to differ in nothing. All the same, whenever one person is ruling and another being ruled, the one ruling tries to distinguish himself [from the ruled] in dress, titles, and honors from the ruled—as, for example, in what Amasis said about his footbath.[28] Male, by contrast, is always related to female in this way.

26. Probably Dionysius I.

27. 1.7.

28. When Amasis (596–525 BC) first became king of the Egyptians, they treated him with contempt because he was of humble origins. So he had a gold footbath made into a statue of a god. The Egyptians treated the statue with great respect. Amasis pointed out that he was like the footbath. He had once been an ordinary person, but he was now a king, worthy of honor and respect. See Herodotus 2.172.

The rule over the children, on the other hand, is kingly; for a begetter rules on the basis both of affection and age, and this is precisely a form of kingly rule. That is why Homer spoke well when he addressed Zeus, who is king of them all, as "Father of gods and men."[29] For a king should be superior by nature, but belong to the same kind, which is precisely the condition of older in relation to younger, and begetter to child.

1.13
The Virtues of Men, Women, Children, and Slaves

It is evident, therefore, that household management is more seriously concerned with human beings than with inanimate property, with their virtue more than with the virtue (which we call "wealth") of acquisition, and with the virtue of free people more than with that of slaves.

The first puzzle to raise about slaves is whether the slave has some other virtue, beyond those he has as an instrument or servant, that is more estimable, such as temperance, courage, justice, and other states of character of this sort, or whether he has none beyond those having to do with the bodily assistance he provides. For there is a puzzle either way; for if slaves do have these other virtues, in what respect will they differ from free? If they do not, it is strange, since slaves are human beings and have a share in reason. Pretty much the same question arises concerning woman and child, as to whether there are virtues proper to them too—whether a woman must be temperate, courageous, and just or not, and whether there are temperate and intemperate children or not.

This question, then, about what is ruled by nature and what is ruling by nature must be investigated in universal terms, as to whether their virtue is the same or distinct. For if both of them must share in noble-goodness,[30] why should one of them rule and the other be ruled once and for all? (For it cannot be that the difference between them is one of more or less; for being ruled and ruling differ in form, not in the more and less.) On the other hand, if the one must share in virtue, while the other must not, that would be a wonder. For if the ruler is not going to be temperate and just, how will he rule well? And if the ruled is not going to be, how will he be ruled well? For if he is intemperate and cowardly, he will do none of his duties. It is evident, **1260ª1** therefore, that both must share in virtue, though there must be differences in it, just as there are in those who are by nature ruled.[31]

Consideration of the soul leads at once to this view; for in it there is by nature a part that rules and a part that is ruled, and the virtue of each, we say, is distinct, that of the part that has reason and that of the non-rational part. It is clear, therefore, that

29. E.g., *Iliad* 1.544.
30. *EE* 1249ª16–17.
31. Reading ἀρχομένων.

the same holds in the other cases as well, so that most instances of ruling and being ruled are by nature of this sort. For free rule slaves, male rules female, and a grown man rules a child in different ways, because, while the parts of the soul are present in all these people, they are present in different ways. For a slave does not have the deliberative part at all; the female has it but it lacks control; a child has it but it is incomplete.

It is to be supposed, therefore, that the same necessarily also holds concerning the virtues of character, that all must share in them, but not in the same way—instead, each must have a sufficient share for their own work. That is why a ruler needs to have complete virtue of character (for a work is unconditionally that of the architectonic craftsman, and reason is an architectonic craftsman), while each of the others must have as much virtue as pertains to them. So it is evident that all those mentioned have virtue of character, and that the temperance of a man is not the same as that of a woman, and neither is the courage or justice, as Socrates supposed,[32] but rather men have the courage of a ruler and women the courage of an assistant, and the same holds of the other virtues.

This will also be clear if we instead investigate each particular one; for people who speak in universal terms are deceiving themselves when they say that virtue is good condition of the soul, or correct action, or something of that sort; for it is far better to enumerate the virtues, as Gorgias does,[33] than to define them in this way. That is why the way the poet spoke about woman is the way one must think about every case. He said, "To a woman silence is a crowning glory"[34]—while to a man this does not apply. Since a child is incomplete, it is clear that his virtue too is not his in relation to himself, but in relation to his end and his leader. And the same holds of a slave in relation to his master. But we laid it down that a slave is useful in relation to the necessities, so of [ethical] virtue too he clearly needs only a little—just so much as will prevent him from being deficient in his works because of intemperance or cowardice.

If what has now been said is true, however, one might raise a puzzle as to whether craftsmen too need to have virtue; for shortcomings often occur in their works because of intemperance. Or is this case very different? For a slave shares in his master's living, while a craftsman is at a greater remove, and virtue pertains to him just to the extent that slavery does; for an unrefined craftsman has a sort of limited slavery. **1260b1** Moreover, a slave is among the things that exist by nature, while no shoemaker is, nor any other sort of craftsman. It is evident, therefore, that the cause of such virtue in a slave must be the master, not the one who possesses the science of teaching him his [various] works. That is why those people[35] do not speak correctly who withhold

32. Plato, *Meno* 73a–c.
33. Plato, *Meno* 71d–72a.
34. Sophocles, *Ajax* 293.
35. E.g., Plato, *Laws* 777e–778a1.

reason from slaves, but tell us to make use only of prescriptive commands; for slaves should be warned more than children.

As regards these matters, let them be determined in this way. As for man and woman, father and children, the virtue relevant to each of them, their relationships with each other, what is good and what is not good in these, and how to achieve the good and avoid the bad—it will be necessary to go through all these in connection with the constitutions. For since every household is part of a city, and these are parts of a household, and the virtue of the part must look to the virtue of the whole, it is necessary to look to the constitution in educating both women and children, if indeed it makes any difference to the excellence of a city that its children be excellent,[36] and its women too. And it must make a difference; for the women are half of the free population, and from children come those who share in the constitution.

So, since these matters have been determined, and the rest must be spoken about elsewhere, let us put aside the present accounts as complete and make a new beginning to our discussion. And let us first investigate those who have expressed views about the best constitution.

BOOK 2

2.1
Constitutions Proposed by Others

Since our deliberately chosen project is to get a theoretical grasp on which sort of political community is superior to all others for people who are able to live as far as possible in the way they would pray to live, other constitutions must be investigated too, both some of those used in cities that are said to be in good legislative order, as well as any others that happen to have been spoken about by anyone and that seem to be in good condition, in order that what is correct and useful in them may be seen, and further, that to seek something distinct beyond them not seem wholly to belong to those who wish to play the sophist; instead, we would have it seem that it is because the presently existing constitutions are not in fact in good condition that the methodical inquiry is undertaken.

One must make a start, however, at what is just the natural starting-point of this sort of investigation. For all the citizens must share either everything, or nothing, or some things but not others. It is evident that it is impossible for them to share nothing (for a constitution is a sort of community, and so they must, in the first place, share their location; for the location of one single city is a single one, and citizens are

36. Reading τοὺς παῖδας εἶναι σπουδαίους.

1261ª1 sharers of that one single city). But of the things that it is possible to share, is it better for all of them to be shared in a city that is to be well managed, or is it better for some of them to be shared but not others? For the citizens could share children, women, and property with each other, as in Plato's *Republic*.[37] For Socrates claims there that children, women, and property should be held communally. Is the present practice better, then, or one that is in accord with the law described in the *Republic*?

2.2
The Constitution of the Republic*: Unity*

For the women to be common to all involves many other difficulties, and this one especially, that what causes Socrates to say that things must be legislated in this way is manifestly not what follows from his arguments. Further, the end he says his city should have is impossible, as in fact stated, yet nothing has been determined about how one should define it. I mean about its being best for a city to be as far as possible entirely one; for this is the hypothesis Socrates adopts.[38] And yet it is evident that a city that advances [toward unity] and becomes more and more one will not be a city at all; for a city is in its nature a sort of multitude, and as it becomes more one, it will turn from a city into a household, and from a household into a human being; for we would say that a household is more one than a city, and an individual than a household. So even if someone could achieve this, it must not be done; for it will destroy the city.

A city consists not only of a larger number of human beings, but also of human beings of different forms. For a city does not come about from those who are alike. For a city is different from a military alliance; for a military alliance is useful because of the weight of numbers, even if they are all of the same form; for an alliance naturally exists for the sake of providing assistance in the way that a heavier weight does when placed on a scale. A nation will also differ from a city in this sort of way, when the multitude is not separated into villages, but is like the Arcadians. But things from which one thing must come about differ in form.

That is why reciprocal equality preserves cities, as was said previously in the *Ethics*,[39] since this is also what must exist among people who are free and equal; for they cannot all rule at the same time, but each can rule for a year or in accord with some other time scheme. In this way, then, the result is that they all rule, just as if shoemakers and carpenters were to exchange places rather than the same people always being shoemakers or carpenters. But since it is better to have it this way also in the case of a political community, it is clearly better, where possible, for the same people always to rule. But among those where it is not possible, because all are in nature equal, it is

37. 423e–424a, 449a–466d.
38. *Republic* 462a.
39. *NE* 1132ᵇ31–1133ª31.

at the same time also just for all to share in ruling (regardless of whether it is good or bad to rule), and for those who are equal to take turns, and to be similar when they are out of office, imitates this;[40] for they rule and are ruled in turn, just as if they had become other people. It is the same way among those who are ruling, some hold one office, some another. **1261ᵇ1** 5

It is evident from these considerations, therefore, that a city is not in nature one in the way some people say it is, and that what is said[41] to be the greatest good for cities destroys the cities. And yet what is good for a given thing in fact preserves it. It is also evident in another way that to seek to produce too much unity in a city is not a better thing. For a household is more self-sufficient than an individual, and a city than a household, and a city tends to come into being at the time when the community of its multitude is self-sufficient. If, then, what is more self-sufficient is indeed more choiceworthy, to be less one is more choiceworthy than to be more one. 10 15

2.3
The Constitution of the Republic*: Women and Children (1)*

But then even if this is best for a community, to be as far as possible one, this does not seem to have been proved by the argument that all at the same time say "mine" and "not mine"[42] (for Socrates takes this as a sign that his city is completely one). For "all" is ambiguous. If it means "each individually," perhaps what Socrates wants will more come about; for each will call the same person his "son," the same woman his "wife," the same things his "property," and so on, then, for each of the things that fall to him. As things stand, however, this is not how those who treat women and children as common will speak. Instead, though all [will say "mine" and "not mine"], they will not do so each individually, and similarly for property too—all, but not each of them individually. Therefore, it is evident that a sort of fallacy is involved in "all say"; for "all," "both," "odd," and "even" are ambiguous, and produce contentious deductions even in arguments.[43] That is why in one way it would be noble if all said the same, although this is not possible, while in another way it is not at all productive of harmony. 20 25 30

In addition to this, what is said [by Socrates] is also harmful in another way. For what is held communally by the most people gets the least care; for people give most thought to what is their own, less to what is communal, or only as much as falls to each of them to give; for apart from anything else, the supposition that someone else is attending to it makes them neglect it more, just as, in the case of household services, many servants sometimes give worse service than few. Each of the citizens 35

40. Reading τοῦτο δὲ μιμεῖται.
41. *Republic* 608e.
42. *Republic* 462a–e.
43. I.e., even, as in logic or dialectic where the focus is on arguments themselves.

acquires a thousand sons, although not as an individual, but rather any random one is likewise the son of any random citizen. So all will be likewise neglected by them all.

1262a1 Further, each says "mine" of anyone among the citizens who is doing well or badly, and says "mine" in this sense, that he is whatever fraction he happens to be of a certain number. What he really means is "mine or so-and-so's," referring in this way to each of the thousand or however many compose the city, and even then he is in doubt; for it is not clear who has had a child born to him, or whether any that were born survived. And yet is this way of calling the same thing "mine" as practiced by each of two or ten thousand people really better than the way they say "mine" in cities as things stand? For the same person is called "my son" by one person, "my brother" by another, "my cousin" by a third, or something else in virtue of some other sort of kinship, whether of blood or connection by marriage—his own marriage, in the first instance, or that of his relatives. Still others call him "my fellow clansman" or "my fellow tribesman." For it is better to have a cousin of one's own than a son in that [Socratic] way.

Nonetheless, it is not even possible to prevent people from having some suspicions about who their own brothers, sons, fathers, and mothers are; for the resemblances that occur between parents and children will necessarily be taken as a demonstration of this. And this is precisely what actually happens, according to the reports of some of those who write accounts of their world travels;[44] for they say that some of the inhabitants of upper Libya hold their women communally, and yet distinguish the children they bear by resemblances. And there are some women, as well as some females of other animals, such as mares and cows, that have a strong natural tendency to produce offspring resembling their sires, like the mare in Pharsalus called "the Just."[45]

2.4
The Constitution of the Republic*: Women and Children (2)*

Further, there are also other difficulties of this sort that are not easy for those establishing this sort of community to avoid, such as assaults, voluntary or involuntary homicides, or verbal abuse. None of these is pious when committed against fathers, mothers, or not too distant relatives (just as none is so even[46] against outsiders). But they will necessarily occur even more frequently among those who do not know their relatives than among those who do—and when they do occur, the latter can perform the customary expiations, while the former cannot.

It is also strange that while making sons communal, he forbids only sexual intercourse between lovers, but does not prohibit sexual love itself or the other practices

44. *HA* 586a13–14.
45. *HA* 586a13.
46. Reading καὶ.

which, between father and son or a pair of brothers, are most unseemly, since even the love alone is so. It is also strange that Socrates forbids sexual intercourse of this sort not due to any other causes but solely because the pleasure that comes from it is so strong, but thinks that the lovers being father and son or brother and brother makes no difference.[47]

It would seem more useful to have the farmers rather than the guardians share their women and children; for there will be less friendship where women and children are held communally. But, with a view to obedience and preventing rebellion, it is the ruled who should be like that. **1262b1**

In general, the effects of such a law as this must of necessity be the contrary of those that correctly laid down laws should be causes of, and the contrary of what led Socrates to think that matters concerning children and women should be ordered in this way. For we think friendship to be the greatest of goods for cities (for in this way people are least likely to engage in faction). And Socrates most of all praises a city's being one—something that seems to be, and that he himself claims to be, the work of friendship. Similarly, in the accounts of love,[48] we know that Aristophanes says that lovers, because of their intense friendship, have an appetite to grow together and from being two become one. The result in such circumstances, however, is that one or both have necessarily perished. And in a city friendship necessarily becomes watery through this sort of community, and the fact that a father hardly ever says "mine" of a son, or son of a father. For just as adding a lot of water to a drop of sweet wine makes the mixture imperceptible, so the same happens here with the kinship connections expressed in these names, it being hardly ever necessary in a constitution of this sort for a father to take care of his sons as sons, or a son his father as a father, or brothers each other as brothers. For there are two things above all that make human beings care and feel friendship, what is special [to them] and what is beloved—neither of which can exist among people under a constitution of this sort.

But then about the transference of the children, once born, from the farmers and craftsmen to the guardians, and vice versa, there is also much confusion about the way it will be done—that is, those who do the transferring and receiving must know who has been transferred to whom.

Further, in these cases what was mentioned previously—I mean assaults, love affairs, and homicides—must of necessity happen even more often; for those who have been transferred to the other citizens will no longer call the guardians "brothers," "children," "fathers," or "mothers," nor will those who have been transferred to the guardians use these terms of the other citizens, so as to avoid, through kinship, committing any offenses of this sort.

About the community of children and women, then, let this be the way our determinations are made.

47. *Republic* 403a–c.
48. Plato, *Symposium* 192c–193a.

2.5
The Constitution of the Republic*: Property*

The next issue to investigate is property, and the way those who are going to be governed by the best constitution should establish it, and whether property is to be held communally or not. One could investigate these questions even separately from the legislative provisions dealing with children and women. I mean whether in matters concerning property, even if children and women are held separately (which is now the way it is everywhere), it still might be best for property at least, or its use, to be communal—for example, the land might be held separately, while the crops grown on it are brought into a communal store to be consumed [communally] (which is precisely what happens in some nations), or, contrariwise, the land might be held communally and farmed communally, while the crops grown on it are divided up for private use (some barbarians are also said to share things in this way), or both land and crops could be communal.

If others worked the land, the way would be different and easier, while if the citizens do the work for themselves, matters concerning property will give rise to much discontent. For if the citizens happen to be unequal rather than equal both in the profits they enjoy and in the work they do, accusations will necessarily be made against those who enjoy or take a lot but do little work by those who take less but do more. In general, indeed, it is difficult to live together and to share in any human concern, above all in ones such as these. This is made clear by the community of travelers away from home; for pretty much the majority of them start quarreling, because they irritate each other in humdrum matters and little things. Further, the servants with whom we get most irritated are those we employ most regularly for day-to-day services.

The communal ownership of property, then, involves these and other similar difficulties. The way that exists now, if adorned by [the relevant] habits and by the order characteristic of correct laws, would be superior, and not by a little. For it would have the good resulting from both (by "from both" I mean both from the property's being communal and from its being private). For while property should in a way be communal, in general it should be private. For dividing up the care of it will produce not mutual accusations, but rather will lead to greater care being given, as each will be attending to his own. But as regards use, it is thanks to virtue that, in accord with the proverb, "the things of friends are common possessions."

Even now this way of arranging things exists in outline in some cities, on the supposition that it is not impossible. In well-managed cities, in particular, some elements of it exist, while others could come about; for although each citizen does have his own private property, he makes available some things to be useful to his friends, and uses some others as if they were communal—for example, in Sparta they use each other's slaves (one might almost say) as their own, and horses and dogs as well, and if they need supplies when on a journey, they may find them in the farms throughout the

territory. It is evident, therefore, that it is better for property to be private, but for its use to be made communal. And to see to it that people become disposed in such a way is the special work of the legislator.

Further, it also makes an untold difference to one's pleasure to regard something as one's own. For it is not perhaps pointless that each self loves himself, but is rather something natural. Self-love is blamed, and justly so. This is not loving oneself, however, but rather loving oneself more than one should, just as in the case of the love of money; for (one might almost say) everyone does love each of the things of this sort. But then too it is very pleasant to assist one's friends, guests, or companions, and do them favors, and this happens when the property is one's own. These things, then, do not take place for those who make the city too much one thing, and in addition it is evident that they do away with the work of two of the virtues, temperance in regard to women (for to keep away from another man's woman due to temperance is noble work) and generosity with one's property (for one cannot show oneself to be generous, nor perform any generous action; for it is in the use made of property that generosity's work lies).

Such legislation looks attractive, then, and may seem to appeal to human feelings; for anyone who hears of it accepts it gladly, thinking that all will have a wondrous friendship for all, especially when someone blames the evils now existing in constitutions on property's not being communal (I mean suits against each other over contracts, perjury trials, and flattery of the rich). Yet none of these bad things comes about because property is not communal but because of depravity, since we see that those who own and share property communally have far more disagreements than those who own their property separately. But in theory we take those who disagree over what they own communally to be few in number, because we compare them to the many whose property is private. Further, it would be just to mention not only how many bad things people will be deprived of by sharing, but also how many good things. Their life, though, appears altogether impossible.

The cause of Socrates going astray one must consider to be the incorrectness of his assumption. For a household and a city should indeed be in a way one, but not in every way. For as a city proceeds in this direction, there is a point at which it will in one way cease to be a city and at which, in another way, while it will still be a city, as it comes closer to not being a city, it will be a worse city. It is as if one were to reduce a harmony to a unison, or a rhythm to a single beat. But because a city is a multitude, as was said previously,[49] it must be unified and made into a community through education. And it is strange that the one who intends to introduce education, and who believes that through it the city would be excellent, should think to rectify it by measures of this sort, and not by habits, philosophy, and laws, just as in Sparta and Crete the legislator made property communal by means of communal messes.

49. 1261[a]18.

1264a1 And one must not ignore this point either, that one must pay attention to the long period of time and the many years during which it would not have gone unnoticed if these measures were any good; for pretty much everything has been discovered, although some things have not been collected, and others, though known, are not used. The matter would become especially evident, however, if one could see by the facts a constitution established in this way; for it is impossible to produce a city without separating the parts and dividing [them], some into communal messes, others into clans and tribes.

So nothing else will result from the legislation except that the guardians will not farm—which is precisely what the Spartans are trying to do even as things stand.

Neither, for that matter, has Socrates said what mode of the constitution as a whole applies to those who share in it, nor is it easy to say. And yet the multitude of the other citizens is pretty much the entire multitude of his city, but nothing has been determined about whether the farmers too should have communal property or each his own private property, or, further, whether both their women and their children should be private or communal.

If, in fact, all is to be held communally by all in the same way, how will these farmers differ from the guardians? And what more will they get by submitting to their rule? Or what will they learn to make them submit to it—unless the guardians adopt some clever stratagem like that of the Cretans? For they allow their slaves to have the same other things as themselves, forbidding them only the gymnasia and the possession of weapons.

On the other hand, if the farmers too are to have things of this sort, as they do in other cities, what way will their community be ordered? For of necessity there will be two cities in one, and those opposed to each other. For Socrates makes[50] the guardians into a sort of garrison, while he makes citizens of the farmers, craftsmen, and the others. Accusations, suits, and such other bad things as he says exist in other cities will all then exist among them too. And yet Socrates claims that because of their education they will not need many regulations (for example, city or market ordinances, or others of that sort), though he gives this education only to the guardians.

Further, he gives the farmers control of their property, although he requires them to pay a tax.[51] But this is likely to make them much more difficult to deal with and full of their own ideas than the helots, serfs, and slaves that some people have today.

But whether the same things are indeed similarly necessary for the farmers or not, has in fact nowhere been discussed—and neither has the related question of what constitution, education, and laws they are to have. It is not easy, either, to discover what sort of people these are, nor is the difference it makes to the preservation of the community of the guardians a small one. But if, at any rate, Socrates is going to make
1264b1 their women communal and their property private, who will manage the household

50. *Republic* 415a–417b, 419a–421c, 543b–c.
51. Rejecting the addition of τοὺς.

in the way the men manage things in the fields? Who will manage it, indeed, if the farmers' women and property are communal? It is also absurd to draw a comparison with wild beasts in order to show that women should engage in the same practices as men; wild beasts have no share in household management.

The way Socrates appoints rulers is also unstable. For he makes the same people rule all the time, which is a cause of faction even among people who have no recognized worth, and all the more so, then, among spirited and warlike men. But it is evident that it is necessary for him to make the same people rulers; for the gold from the god has not been mixed into the souls of one lot of people at one time and another at another, but always into the same ones. He says[52] that the god, immediately at their birth, mixed gold into the souls of some, silver into others, and bronze and iron into those who are going to be craftsmen and farmers.

Further, even though Socrates does away with the happiness of the guardians, he says that the legislator should make the whole city happy. But it is impossible for the whole city to be happy unless all, or most or some, of its parts possess happiness. For happiness is not the same thing as evenness; for it is possible for the latter to be present in the whole without being present in any of the parts, while happiness cannot. But if the guardians are not happy, who else is? Surely not the craftsmen or the multitude of those who are unrefined.

These, then, are the puzzles raised by the constitution Socrates describes, and there are others that are not inferior to these.

2.6
The Constitution of the Laws

Pretty much the same holds in the case of the *Laws*, which was written later; that is why it is better that the constitution there be also briefly examined. For in fact in the *Republic* Socrates[53] has determined altogether few things: how things should stand concerning the community in women and children, concerning property, and concerning the order characteristic of the constitution; for the multitude of the inhabitants is divided into two parts: the farmers and the part that goes to war for it, and from the latter comes a third, the deliberative and controlling element in the city. But about whether the farmers and craftsmen will share in ruling to some extent or not at all, and whether or not they too are to possess weapons and join in battle—about these matters Socrates has determined nothing. He does think, though, that the women should join in battle and receive the same education as the guardians. Otherwise, he has filled out his account with extraneous material, in particular about what sort of education the guardians should receive.

52. *Republic* 415a–c.

53. Socrates is not in fact a character in the *Laws*, but Aristotle includes the dialog among Plato's "Socratic accounts" ($1265^{a}11$).

1265a1 The *Laws* consists for the most part of laws, and he has said little about the constitution. And, although he wishes to make this one more attainable by [actual] cities, he gradually turns it back toward the other. For, with the exception of the community in women and property, the other things he assigns to both constitutions are the same: the same education, living in abstention from the necessary works, and the communal messes in like manner—except that in this constitution he says that there are to be messes for women too, and that those possessing hoplite weapons should be five thousand, while it is one thousand there.

All the Socratic accounts are extraordinary, sophisticated, innovative, and exhibit a spirit of inquiry, but it is presumably difficult to do everything well. In the case of the multitude just mentioned, for example, one must not overlook the fact that it would need a territory the size of Babylon, or some other unlimitedly large territory, to nourish five thousand in idleness, and another mob of women and servants, many times as great, along with them. One should assume conditions that answer to one's prayers, to be sure, but not ones that are impossible.

It is said[54] that the legislator should look to just two things in setting up his laws: the territory and the human beings. But, further, it would be good to add that he should look to the neighboring places too, if, first of all, the city is to live a political life and not an isolated one; for it must then possess the weapons that are useful for war not only in its own region, but also against the places outside it. If, however, one rejects this sort of life, both for the individual and for the city communally, the need to be fearsome to enemies is just as great, both when they have invaded its territory and when they have left it.

And the quantity of property should also be looked at, to see whether it would not be better to define it differently and in a more perspicuous way. For he says that there should be as much as is needed "to live temperately," which is as if one were to say, "to live well"—for this is too universal. Further, it is possible to live temperately but miserably. A better definition would be "to live temperately and generously" (for, when separated, the one will lead to poverty, the other to luxury), since these are the only choiceworthy states concerned with the use of property—for example, one cannot use property either in a mild-mannered way or in a courageous one, but one can do so temperately and generously. So the states concerned with its use must also be these.

Also, it is absurd that while property is equalized nothing is established concerning the number of citizens, but instead the production of children is allowed to be unlimited, on the supposition that it will remain sufficiently close to the same number, due to childlessness, no matter how many births there are, because this seems to
1265b1 be what happens in present-day cities. But the exactness this requires is not the same there as in cities nowadays; for nowadays, no one is left without resources because properties are divided among however great a number there happens to be. But in

54. Not in the extant *Laws*. Aristotle may be inferring it from 704a–708d, 747d, 842c–e.

that city properties are indivisible, so that excess children will necessarily get nothing, no matter whether they are fewer or greater in number. One might well take it that it is the production of children that should be restricted, rather than property, so that no more than a certain number would be born, and that this number should be fixed by looking to the chances of some of those who are born dying, and of childlessness on the part of others. To leave the number unrestricted, as is done in most cities, necessarily causes poverty among the citizens; and poverty produces faction and crime in the city. In fact, Pheidon of Corinth,[55] one of the most ancient legislators, thought that the households and the number of citizens should be kept equal, even if the allotments of land everyone had were of unequal size to begin with, while in the *Laws*, it is just the contrary. But these matters, and how we think these matters could be better handled, must be spoken about later on.[56]

Also omitted in these *Laws* are matters concerning the rulers and how they will differ from the ruled. For he says[57] that just as warp and woof come from different sorts of wool, so should the rulers stand in relation to the ruled. And since he permits[58] someone's total property to increase up to five times its original value, why should this not also hold of land up to a certain point? Also, the division of homesteads needs to be investigated, in case it is disadvantageous to household management; for to each individual he assigned[59] two homesteads, dividing them and making them separate, but it is difficult to manage two households.

The whole order is intended to be neither a democracy nor an oligarchy but a mean between them. It is called a "polity"; for it is made up of those with hoplite weapons. If he is establishing this, in comparison with [all] other constitutions, as the most attainable by other [actual] cities,[60] what he has said is perhaps correct, but if as next best after the first constitution, it is not correct. For one might well give more praise to the Spartan constitution, or some other more aristocratic one. Some say, indeed, that the best constitution must be a mixture of all constitutions, which is why they praise the Spartan one (for some assert that it is made up of oligarchy, monarchy, and democracy, saying that the kingship is a monarchy, the office of senators an oligarchy, and that it is governed democratically in virtue of the office of the overseers, because the overseers come from the people, while others say that the overseership is a tyranny, and that the democratic governing lies in the communal messes and the rest of daily life). But in these *Laws* it is said that the best constitution **1266ª1** should be composed of democracy and tyranny[61]—constitutions one might well take

55. Otherwise unknown.
56. 7.5, 7.10, 7.16.
57. *Laws* 734e–735a.
58. *Laws* 744e.
59. *Laws* 745c–e, 775e–776b.
60. I.e., as more attainable ($1265^{a}1$) than all other constitutions, and so most attainable.
61. Actually, monarchy and democracy (756e).

as not constitutions at all, or as the worst of all. They speak better, then, who mix together a larger number; for the constitution composed of a larger number is better.

Next, the constitution in the *Laws* manifestly has no monarchical element at all, but [only] oligarchic and democratic ones, with a tendency to lean more toward oligarchy. This is clear from the appointment of officials; for while choosing by lot from a previously elected pool is common to both, to require richer people to attend the assembly and to vote for officials, or to do some other political task, without requiring these things of the others, is oligarchic. The same is true of the attempt to make the majority of officials come from among the rich, with the most important ones coming from among those with the highest property assessment.

He also makes the election of the council oligarchic.[62] For everyone is required to elect candidates from the first property assessment class, then again in the same way[63] from the second, then from the third—except that not everyone is required to elect candidates from the third or the fourth, and only members of the first and second are required to elect candidates[64] from the fourth. Then from these, he says, an equal number must be designated from each assessment class. More of them, then, will come from the highest assessment classes and the better sort, because some of the people will not vote because they are not required to.

It is evident from these considerations, then, and from what will be said later on,[65] when our investigation turns to this sort of constitution, that a constitution of this sort should not be composed of democracy and monarchy. But in fact as regards the election of officials, electing from the elected is dangerous. For if some are willing to combine, even if they are a relatively small number, the elections will always turn out according to their wish.

This, then, is the way matters stand concerning the constitution in the *Laws*.

2.7
The Constitution of Phaleas of Chalcedon

There are also certain other constitutions, proposed either by private individuals or by philosophers and politicians, but all of them are closer to the established constitutions, by which people are governed as things stand, than either of the ones just discussed. For no one else has ever suggested the innovations of sharing children and women, or of communal messes for women. Instead, they start with the necessities. For to some of them it seems that the most important thing is to have matters concerning property ordered in a good way; for they say that it is over these matters that everyone creates factions.

62. 756b–e.
63. Reading ἴσως.
64. Reading τοὺς.
65. 4.7–9, 1296[b]34–1297[a]13.

That is why Phaleas of Chalcedon, the first to propose a constitution of this sort, did so; for he says that the property of the citizens should be equal. He thought that this was not difficult to produce when cities were just being settled, that in those already settled it would be more difficult, but that nonetheless a leveling could be very quickly achieved by the rich giving but not receiving dowries, and the poor receiving but not giving them.

Plato, when writing the *Laws*, thought that up to a certain point things should be left alone, but that no citizen should be permitted to have a property more than five times the size of the smallest, as was also said previously.[66] But people who legislate in this way must not forget, as they now do, that, while regulating the quantity of property, they should also regulate the quantity of children; for if the number of children exceeds the size of the property, it is necessary for the law to be abrogated at least. But abrogation aside, it is a bad thing for many people to become poor after having been rich; for it takes work for [the city not to allow] people of this sort to become revolutionaries.

That is why the leveling of property does indeed have some influence on political communities. This was manifestly recognized even by some in ancient times—for example, both in the legislation of Solon[67] and in the law in force elsewhere that prohibits anyone from getting as much land as he might wish. Laws likewise prevent the sale of [landed] property, as among the Locrians, where the law forbids it unless an evident misfortune can be shown to have occurred. In yet other cases it is required that the original allotments be preserved. It was the abrogation of this provision at Leucas that made their constitution democratic too; for, as a result, offices were no longer filled from the designated assessment classes. But equality of property may exist and yet the amount may be too great, so that it leads to luxury, or too low, so that it leads to living in a penurious way.

It is clear, then, that it is not sufficient for the legislator to make property equal: he must also aim at the mean. Further, even if one were to arrange a moderate property for everyone, it would be no benefit; for one should rather level appetites than property, and that cannot happen unless people have been sufficiently educated by the laws.

But perhaps Phaleas would reply that this is actually what he was saying; for he thinks that cities should have equality in these two things: property and education. But one must also say what the education is going to be, and to have it be one and the same is no benefit; for it can be the same and one, but the sort from which people will become disposed to deliberately choose to get more wealth or honor or both.

Further, people engage in faction not only because of inequality of property but also because of inequality of honors—although in contrary ways in each case: ordinary people do so because of inequality in property, sophisticated ones because of

66. $1265^{b}21–23$.
67. $1273^{b}35–1274^{a}21$, *Ath*. 5–12.

1267a1 honors, if they are equal. Hence the saying: "Noble and base are held in a single honor."[68]

Human beings, however, do not commit injustice only because of the necessities, which Phaleas thinks equality of property will remedy (in that they will not steal because of cold or hunger), they also commit them to get enjoyment and assuage their appetites; for if they have an appetite for more than the necessities, they will seek to cure it by committing injustice—and not, you may be sure, because of this alone, but rather, even without appetites, they will commit injustice in order to enjoy the pleasures that are without pain. What, then, is the remedy for these three? For the first, moderate property and work to do; for the second, temperance; third, if certain people wish to find enjoyment through themselves, they should not look for a remedy beyond philosophy. For all other pleasures require [other] people. The greatest injustices, at any rate, are committed because of excess and not because of the necessities—for example, no one becomes a tyrant to escape the cold. That is why the honors are great when one kills not a thief but a tyrant. So Phaleas' mode of constitution would be a help only against minor injustices.

Further, he wishes to establish many things thanks to which the citizens will govern well in their relations with each other, while he should also establish things thanks to which they will do so in their relations with neighbors and outsiders as a whole. It is necessary, therefore, for the constitution to be ordered with a view to military strength, about which he has said nothing.

Matters are similar as regards property. There needs to be enough not only for use within the city, but also to meet external dangers. That is why the quantity of it on hand should be neither so great that stronger neighbors will have an appetite for it, and the owners unable to repel the attackers, nor so little that they cannot sustain a war even against those who are equal or similar.

Although Phaleas has determined nothing about this, one should not overlook how much property it is advantageous to have. Perhaps the best defining mark is this: that those [neighbors] who are stronger will not profit if they go to war because of the [city's] excess in property, but as they would if the property were not so great. For example, when Autophradates was about to lay siege to Atarneus, Eubulus told him to consider how long it would take to capture the place, and then to calculate what such time would cost; for he said he was willing to abandon Atarneus at once for less. These words made Autophradates have second thoughts and stop the siege.

So, while equalizing the property of citizens is among the things that are advantageous with a view to their not engaging in faction against each other, it is (one might almost say) no big thing. For in fact sophisticated people would get vexed, on the grounds that they deserve not to be equal, which is why indeed they are often seen being on the attack and engaging in faction. Further, the wickedness of people is an
1267b1 insatiable thing, and a mere two obols is enough at first, but once that has become

68. Homer, *Iliad* 9.319.

traditional, they always ask for more, and go on doing so without limit. For it is the nature of appetite to have no limit, and satisfying it is what ordinary people live for. The starting-point in matters of this sort, then, rather than leveling property, is to establish things so that while those who are by nature decent are of such a sort that they do not wish to get more, the base ones cannot do so—which will be the case if they are weaker and not treated unjustly.

But even about the equalizing of property Phaleas has not spoken correctly. For he equalizes only landed property, but wealth also exists in slaves, livestock, and money, and there is a great supply of it in so-called movables. So either equality—or some moderate regulation—should be sought in all these or all should be left alone.

It is also evident from his legislation that the city he is establishing is a small one—if, at any rate, all the craftsmen are to be public slaves and are not to contribute to the full membership of the city. But if indeed those engaged in doing public works should be public slaves, it should be in this way, just as it was in Epidamnus and as Diophantus tried to establish in Athens.

Concerning the constitution of Phaleas, then, one should, on the basis of these considerations, be pretty much able to get a theoretical grasp on whether he spoke correctly on some issue or incorrectly.

2.8
The Constitution of Hippodamus of Miletus

Hippodamus of Miletus, the son of Euryphon, was the man who invented the division of cities and laid out the street plan for Piraeus. (He was extraordinary in other aspects of his life as well, because of his love of honor, so that he seemed to some people to be overly affected, with his long hair, expensive jewelry, and with the same cheap warm clothing besides, worn not only in winter but also in summer, and his wish too to be considered well-versed about nature as a whole.) He was the first of those not engaged in politics who attempted to say something about the best constitution.

The city he wanted to establish had a multitude of ten thousand citizens, divided into three parts; for he made one part the craftsmen, one the farmers, and a third to go to war for the city and possess weapons. And he wanted to divide the territory into three parts—one sacred, one public, and one private. That from which what is customarily rendered to the gods was produced would be sacred; that from which the ones who go to war for it would live, public; and the land belonging to the farmers, private.

He thought that there were just three forms of laws; for the things about which suits arise are three in number—wanton aggression, harm, and death. He also wanted to legislate a single court with [complete] control, to which all suits thought not to have been well judged were to be referred, which he proposed to establish from

1268a1 a certain number of elected elders. Court judgments should not be rendered, he thought, by casting ballots, but rather each judge should deposit a tablet: if he simply convicts, he should write the penalty on it; if he simply acquits, he should leave it blank; if he convicts to some extent and acquits to some extent, he should make the relevant distinctions. For he thought that as things stand legislation is not well drafted; for it compels judges to violate their oath[69] by judging one way or the other.

Further, he set up a law that those who discover something advantageous to the city should be honored, and that children of those who die in war should receive support from public funds, on the supposition that this had not been legislated elsewhere, while a law of this sort actually exists both in Athens and in some other cities. The officials were all to be elected by the people, and the people to be made up of the city's three parts. Those elected were to supervise communal matters, matters relating to aliens, and matters relating to orphans.

These, then, are most of the features of Hippodamus' order, and the ones that are most worth discussing. And the first puzzle to raise would be with the division of the multitude of citizens. For the craftsmen, the farmers, and those who possess weapons all share in the constitution. But the fact that the farmers do not possess weapons, and that the craftsmen possess neither land nor weapons, makes them both pretty much slaves of those who do possess weapons. So it is impossible that every office be shared; for the generals, civic guards, and all the officials with (one might almost say) the most control will necessarily be appointed from those who possess weapons. But if the farmers and craftsmen do not share in the constitution, how can they possibly have any friendly feelings for the constitution? On the contrary, those who possess weapons have to be stronger than both of the other parts. Yet that is not easy unless they are numerous; and, in that case, is there any need to have the others share in the constitution or control the appointment of officials?

Further, what use are the farmers to the city? Craftsmen are necessary (for every city needs craftsmen), and they can support themselves, just as in other cities, from their craft. The farmers would reasonably have been some part of the city if they provided nourishment for those who possess weapons, while, as things stand, they have private land and farm it privately.

Further, there is the public land, from which the ones who go to war for the city are to get their nourishment. If they are to farm it themselves, the fighting part will not be different from the farming one, as the legislator wishes them to be. And if there are going to be some others to do so, different from those who farm privately and from the warriors, this will be a fourth part again in the city, which shares in nothing and is alienated from the constitution. But then if one were to make those who farm the private land and those who farm the public land the same, the quantity 1268b1 of produce from each one's farming will be inadequate for two households. And why

69. *Rh.* 1375a29–30, b16–17.

is it that they will not from the same land and the same allotments at once provide nourishment for themselves and for the soldiers? There is much confusion in all this.

The law about judgments is not good either, requiring judging to consist in making distinctions, while the charge is written in unconditional terms—that is, making a judge into an arbitrator. This is possible in arbitration, even if there are many arbitrators (for they can confer together over their judgment). But it is not possible with courts, and, indeed, most legislators do the contrary and establish things so that the judges do not confer with each other.

In addition, how will the judgment not be confused when a judge thinks the defendant owes something, but not as much as the plaintiff thinks? For if the plaintiff claims twenty minas, but the judge awards ten (or the former more, the latter less), another awards five, and another four, it is clear, then, that they will split the award in this way, while some will convict for the whole sum, and others for nothing. In what way, then, will the votes be counted?

Further, nothing compels a judge who, in a just way, unconditionally acquits or convicts to perjure himself, if indeed the accusation was written in unconditional terms. For one who acquits is not judging that the defendant owes nothing, only that he does not owe the twenty minas. But a judge who convicts, without believing that he owes the twenty minas, violates his oath straightway.

As for his suggestion that those who discover something advantageous to the city should receive some honor, legislation of this sort is not safe, but only pretty to listen to; for it would involve "sycophancy" and might even lead to change in the constitution. But this slides into another problem and another investigation; for some people raise the puzzle of whether it is advantageous or harmful to cities to change their ancestral laws, if some other is better. That is why, if indeed change is not advantageous, it is not easy to give ready assent to what Hippodamus says; it is possible, however, that certain people might propose that the laws or the constitution be dissolved on the supposition that this is for the common good.

Since we have mentioned this issue, however, it is better to expand on it a little. For, as we said, there is a puzzle here and change may seem better. In the other sciences, at any rate, change has certainly proved to be advantageous—for example, medicine has changed from its ancestral ways, as has athletic training, and all the crafts and capacities generally. So, since politics too must be counted as one of these, it is clear that something similar must also hold of it.

A sign of this, one might claim, is provided by the facts themselves; for the laws [or customs] of ancient times were exceedingly simple and barbaric. For example, the Greeks used to both carry weapons and buy women from each other, and the pieces that remain of ancient laws in some places are altogether naive—such as the homicide law in Cyme that if the prosecutor can provide a number of his own relatives as witnesses, the defendant is guilty of murder. **1269^{a}1**

In general, everyone seeks not what is ancestral but what is good. But it is probable that the first ones, whether they were "earth-born" or the survivors of some

cataclysm,[70] were like random people [today] or people who lack understanding (and this in fact is precisely what is said about the earth-born). So it would be absurd to cling to their beliefs.

In addition, it is not better to leave written laws unchanged either. For just as it is in the other crafts, so too in [the science of] political order, it is impossible to write down everything exactly; for it is necessary to write them in universal terms, while actions are concerned with particulars.

From these considerations, then, it is evident that some laws must sometimes be changed. But to those who investigate the matter in another way this would seem to require much caution; for if the improvement is small, and if it is a bad thing to accustom people to casual abrogation of the laws, then some of the legislators' or rulers' errors must manifestly be left unchanged; for the benefit resulting from the change will not be as great as the harm of being made accustomed to disobey the rulers.

On the other hand, the paradigm involving the crafts is false; for changing a craft is not like changing a law; for the law has no strength to secure obedience except habit, and habit does not develop except over a long period of time. So to change easily from existing laws to new and different ones is to weaken the capacity of law itself.

Further, if laws are indeed to be changed, are they all to be changed, and in every constitution, or not? And by any random person, or by certain ones? For these things make a big difference. Let us therefore set aside this investigation for the present; for it belongs to other occasions.[71]

2.9
The Spartan Constitution

About the Spartan constitution and the Cretan one, and about pretty much all the other constitutions as well, there are two investigations to be made, one whether there is anything legislated in it that is good or not good with a view to the best order, the other whether there is anything legislated in it that is contrary to the hypothesis or to the mode of constitution they actually have.

It is generally agreed that a constitution that means to be governed in a good way must provide leisure from necessary works. But the way to provide this is not easy to grasp. For the Thessalian serfs have often attacked the Thessalians, just as the helots have the Spartans (for they are forever lying in wait, as it were, for bad luck to strike their masters). But nothing like this has so far happened in the case of the Cretans. Perhaps the cause of this is that the neighboring cities, though they war with each other, never ally themselves with the rebels, because it is not to their advantage to do

70. Plato, *Statesman* 272c–d, *Laws* 677b–678b.
71. Not in the extant *Politics*.

so, since they themselves also possess subject peoples. Sparta's neighbors, on the other hand—Argives, Messenians, and Arcadians—were all hostile. The Thessalians too first experienced revolts because they were still at war with their neighbors—Achaeans, Perrhaebeans, and Magnesians. And it would seem, even if nothing else, that the supervision of serfs, at any rate, and what way one should consort with them, is a troublesome matter; for if they are given license, they become wantonly aggressive and claim to be of equal worth to those in control; and, if they live in misery, they conspire and hate. It is clear, then, that those to whom this happens in connection with helotry have not found the best mode of it.

Further, the license of their women is also detrimental both to the deliberate choice of the constitution and to the happiness of the city as well. For just as part of a household is a man and part a woman, it is clear that a city too should be regarded as being divided into two nearly equal parts: the multitude of the men and that of the women. So in all constitutions in which matters relating to women are badly handled, half the population should be regarded as not being regulated by any law. And this is precisely what has happened in Sparta; for the legislator, wishing the whole city to have resilience, makes his wish evident in the case of the men, but has been negligent in the case of the women; for they live free of discipline, giving in to every sort of intemperance, and luxuriously.

The necessary result is that wealth is esteemed in a constitution of this sort, especially if they are actually controlled by the women, as most militaristic and warlike races are (excluding the Celts and some others who openly esteemed sexual relations between males). For the one who first told the myth seems not to have been unreasonable in coupling together Ares and Aphrodite; for all warlike men seem prone to being possessed by a desire for sexual intercourse either with men or women. That is why this happened to the Spartans, and in the days of their [hegemonic] rule, many things were managed by women. And yet what difference is there between women ruling and rulers ruled by women? For the result is the same. Rashness is not useful in day-to-day matters, but only—if indeed at all—in war, and Spartan women have been very harmful even in this respect. This they made clear during the Theban invasion;[72] for they were of no use at all, as women are in other cities, but caused more confusion than the enemy.

From the start, then, it seems that this license with regard to women occurred in Sparta for good reason. For Spartan men spent much time away from home because of their expeditions, that is, when they were at war with the Argives, and again with **1270^{a}1** the Arcadians and Messenians. When leisure returned, they placed themselves in the hands of their legislator, having been already well prepared by the military life; for it includes many of the parts of virtue. As for the women, people say that when Lycurgus tried to bring them under the laws, they resisted and he retreated. These, then, are the causes of what happened—and, it is clear, of the present error as well.

72. 369 BC under Epaminondas.

But we are not investigating the question of whom we should excuse and whom not, but what is correct and what is not correct.

The fact that matters relating to women are not well-handled seems not only to create a certain impropriety in the constitution itself, as was also said previously,[73] but also to contribute something to the love of money. For after the things just stated one might next criticize the uneven distribution of property. For because some of the Spartans came to own far too much wealth and others altogether too little, the land passed into the hands of a few. And this too is badly ordered through the laws; for the legislator quite correctly made it not noble to buy or sell an existing land holding, but he left owners free to give or bequeath their land if they wished, and yet this necessarily leads to the same results as the other. And, indeed, roughly two-fifths of all the land belongs to the women, both because many become heiresses and because large dowries are given. And yet it would have been better if it had been ordered that there be no dowry, or a small or even a moderate one. But, as things stand, a person can give an heiress daughter in marriage to whomever he wishes, and if a man dies intestate, the person he leaves as his heir gives her to whomever he pleases. As a result, in a land capable of supporting fifteen hundred cavalry and thirty thousand hoplites, there were fewer than a thousand. And it became clear because of the facts themselves that the ordering of these things served them badly; for the city did not withstand one single blow, but was ruined because of the shortage of men.[74]

It is said that in the time of their early kings, they used to give a share in the constitution to others, so that at that time there was no shortage of men, despite the fact that they were at war for a long time. Indeed, they say that at one time the Spartiates actually had ten thousand members. But regardless of whether or not this is true, a better way to keep high the number of men in a city is by leveling property. But the law dealing with the production of children is also opposed to this correction. For the
1270b1 legislator, wishing there to be as many Spartiates as possible, encourages the citizens to have as many children as possible. For there is a law exempting a father of three sons from military service, and a father of four from all taxes. And yet it is evident that if many children are born, and the land has been correspondingly divided, many people will necessarily become poor.

But then matters relating to the board of overseers[75] are badly handled too. For this office by itself controls their most important matters, but the overseers are drawn from among the entire people, so that often very poor men enter it, who, because of their poverty, are open to bribery. (This has been made clear on many occasions in the past as well, and in our own day among the Andrians; for some, corrupted by silver, destroyed the entire city, so far as it was up to them.)

73. 1269b17–23.

74. In the battle of Leuctra in 371 BC.

75. Five ephors or overseers were elected annually by the Spartiates. They supervised the operations of the political and judicial system as a whole, and they served to limit the powers of the two kings.

Also, because the office is too powerful—in fact, equal to a tyranny—even the kings were forced to act the part of popular leaders for the overseers. And because of this too the constitution has been harmed; for from an aristocracy a democracy was emerging.

Certainly, the board of overseers does in fact hold the constitution together—for the people remain at peace because they share in the most important office, so that, whether it came about due to the legislator or due to luck, it is advantageous to Spartan affairs; for if a constitution is going to survive, every part of the city itself must wish it to exist and endure.[76] And the kings are in this condition because of the honor given to them; the noble and good, because of the senate (since this office is a reward of virtue); and the people, because of the board of overseers (since appointments to it are made from all). Still, though the overseers should be chosen from all, it should not be in the way it is now[77] (for it is exceedingly childish).

Further, the overseers control the most important judicial decisions, though they are random people. That is why it would be better if they judged cases not on the basis of their own consideration but in accord with the letter of the laws. Also, the overseers' mode of life is not in keeping with what the city wishes; for while it itself is exceedingly lax, among the others it is excessive in its hardness, so that they are incapable of the resilience [it requires] but secretly escape from the law and indulge in the pleasures of the body.

Also, matters relating to the office of the senators[78] also do not serve the Spartans well either. For if the senators were decent people and sufficiently well educated in manly goodness, one might well say that this office is advantageous to the city—and yet one might dispute about whether they should have lifelong control of important matters (for there is old age of thought as there is of the body). But when they are educated in such a way that even the legislator himself distrusts them on the grounds **1271a1** that they are not good men, it is not safe. And it is evident in fact that in many matters of public concern those who have shared in this office have repeatedly taken bribes and shown favoritism. That is why it is better for the senators not to be exempt from being inspected—which at present they are. On the other hand, it might seem that the overseers should inspect every office; but this would give too much to the board of overseers, and is not the way we say that inspections should be carried out.

The election they conduct of the senators is also decided in a childish way,[79] and for the person who is going to be considered worthy of the office to have to ask for it himself is not correct; for the one worthy of the office should hold it whether he wishes to or does not wish to. But as things stand the legislator is manifestly doing just the same here as in the rest of the constitution. He arranges for the citizens to

76. Reading αὐτά.

77. Either by acclamation or by lot.

78. The Spartan senate (*gerousia*) had twenty-eight members in addition to the two kings, all over sixty and probably chosen from aristocratic families.

79. By an elaborate process of acclamation.

love honor and then uses this fact for the election of the senators; for no one would ask for office who did not love honor. And yet of most voluntary acts of injustice among human beings the majority are pretty much caused by the love of honor or by the love of money.

As regards kingship, whether it is better for cities to have one or better not to have one, is a matter for another account.[80] But it is surely better, at any rate, to choose each new king not as now, but rather in accord with his own mode of life. And it is clear that even the [Spartan] legislator himself did not think it possible to make the kings noble and good men; at any rate, he distrusts them, on the grounds that they are not sufficiently good men. That is why the Spartans used to send out a king's opponents as fellow ambassadors, and why they regarded factional conflict between the kings as tantamount to preservation for the city.

Nor were matters concerning the communal messes (or so-called *phiditia*) well legislated by the person who first put them in place. For they should rather be paid for from public funds, as they are in Crete. Among the Spartans, by contrast, each individual has to contribute, even though some are very poor and unable to afford the expense. So the result is the contrary of the legislator's deliberately chosen aim. For he wishes the communal messes to be established as something democratic, but legislated as they are now they are scarcely democratic at all. For the very poor cannot easily participate in them. Yet the defining mark of this constitution, which is ancestral for them, is that those who cannot pay this contribution cannot participate in it.

The law dealing with the admirals has also been criticized by others, and correctly criticized too. For it becomes a cause of faction; for over against the kings, who are permanent generals, the office of admiral has been put in place as pretty much another kingship.

One might also criticize the hypothesis of the legislator in precisely the way Plato criticized it in the *Laws*;[81] for the entire order characteristic of their laws aims at a part of virtue, military virtue; for this is the virtue that is useful for conquest. They were able to preserve themselves, then, while they were at war, but they started to decline once they ruled supreme, because they did not have the scientific knowledge of how to be at leisure and had never undertaken any sort of training with more control than the military sort. And the error involved in this is not small; for they think that the good things that people fight about are won by virtue rather than by vice, and this is correct, but they also think that these goods are better than virtue itself, and this is not correct.

Matters relating to communal funds are also in a bad condition among the Spartiates. For even though they are compelled to fight major wars there is nothing in the communal fund of the city and taxes are not properly paid; for because most of the land belongs to the Spartiates, they do not examine each other's tax payments.

80. 3.14–17.
81. 625c–638b.

And thus the result for the legislator is the contrary of advantageous; for he has made his city poor and the private individuals into lovers of money.

Concerning the Spartan constitution, then, let this much be said; for these are the things one might particularly criticize in it.

2.10
The Cretan Constitution

The Cretan constitution is very close to the Spartan, and while in some small respects it is no worse, most of it is less polished. For it seems in fact—at any rate, it is said—that the Spartan constitution is largely an imitation of the Cretan, and most older things are less fully elaborated than newer ones. For they say that Lycurgus, when he had relinquished the guardianship of King Charilaus and gone abroad, spent most of his time in Crete, because of the kinship connection; for the Lyctians were colonists from Sparta, and those who went to the colony adopted the order characteristic of laws existing among the inhabitants at that time. That is why even now their subject peoples employ these in the same way, on the supposition that Minos first established the order characteristic of their laws.

The island seems naturally well suited and situated to rule the Greek world; for it lies across the entire sea on whose shores pretty much all of the Greeks are settled; for in one direction it is not far from the Peloponnese, and in the other not far from Asia (the part around Cape Triopium) or from Rhodes. That is why Minos obtained the rule over the sea as well, subjugating some islands, sending settlers to others, and finally attacking Sicily, where he met his death near Camicus.

The Cretan order is analogous to the Spartan. For the helots do the farming for the latter, while the subject peoples do it for the former. Also, both cities have communal messes (and, at any rate in ancient times, the Spartans called these not *phiditia* but **1272ª1** *andreia* ("men's messes") like the Cretans—a clear indication that these came from Crete). Further, there is the order characteristic of the constitution; for the overseers have the same powers as the "order-keepers" (as they are called in Crete), except that the overseers are five in number, while the order-keepers are ten. The senators, whom the Cretans call the "council," are the equals of the Spartan senators. As for kingship, there used to be one in earlier times, but the Cretans did away with it, and the order-keepers have the leadership in war. All share in the assembly, but it has control of nothing except the ratification by vote of the resolutions of the senators and order-keepers.

Matters relating to the communal messes are better handled by the Cretans than by the Spartans. In Sparta, as was said previously,[82] each person must contribute a fixed per capita amount, and, if he does not, a law prevents him from sharing in

82. 1271^{a}29–37.

the constitution, while in Crete they are handled in a more communal way; for, out of all the public crops and livestock and the tributes paid by the subject peoples, one part is set aside for the gods and for communal public services, and another for the communal messes, so that all—women and children and men—are fed at public expense. The legislator regarded moderation in eating as advantageous and devoted much philosophizing to furthering it. And as regards the segregation of women, in order to prevent them from having many children, he has made a place for sexual relations between men—as to whether this was badly done or not badly done, will be investigated on another occasion.[83] It is evident, then, that matters relating to the communal messes have been better ordered by the Cretans than by the Spartans.

Matters relating to the order-keepers, on the other hand, are even worse than those relating to the overseers. For while what is bad in the board of overseers is also bad in the board of order-keepers (for it is composed of random people), what is for the advantage of the constitution there does not exist here. For there, the election being from all, the people share in the most important office, and so wish the constitution to continue. Here, by contrast, the order-keepers are elected not from all but from certain families, and the senators are elected from those who have been order-keepers. And one might make the same arguments about the Cretan senators as about those who become senators in Sparta (for their exemption from inspection and their life-tenure are greater prerogatives than they are worthy of, and it is dangerous that they rule not in accord with what is written down, but on the basis of their own consideration).

The fact that the people remain at peace even though they do not share in [the most important office] is no sign that it has been well-ordered; for there is no profit in it for the order-keepers, as there is for the overseers, because they live on an island, far away indeed from any who might corrupt them.

As for the cure the Cretans use for this error,[84] it is strange and characteristic not of a political constitution but of a dynasty. For the order-keepers are frequently expelled by a conspiracy either of their fellow rulers themselves or of private individuals, and it is also possible for the order-keepers to resign office in the middle of their term. But surely it is better if all these things should take place in accord with law and not with the wish of human beings; for the latter is not a safe standard.

Worst of all, however, is the suspension of order-keepers, which the powerful frequently put in place, when they wish to escape punishment at the hands of justice, which makes it clear that the order has something of a constitution about it, yet is not a constitution but more of a dynasty. And their habit is to create anarchy, form factions, and fight each other by dividing the people and their own friends into parties. And yet how does this sort of thing differ from the city ceasing to be

83. Not in the extant *Politics*.

84. Restricting the senators and order-keepers to certain families.

such for a period of time and the political community dissolving? But a city in this condition is in great danger, when those who wish to attack it are also able to do so. But, as was said, Crete is preserved by its location; for its remoteness has served to keep foreigners out. That is why the institution of subject peoples survives among the Cretans, while the helots frequently revolt. For the Cretans do not share in external rule—although a foreign war has recently come to the island, which has made the weakness of its laws evident.

About this constitution, then, let this much be said.

2.11
The Carthaginian Constitution

The Carthaginians also seem to manage their constitution well, and in many respects in an extraordinary way as compared to other people, although in some respects mostly much the same as that of the Spartans. For these three constitutions, the Cretan, Spartan, and, third among them, the Carthaginian, are all in a way very close to each other and very different from the others. Many of their ordinances are well-handled, and it is a sign that their constitution is well-ordered that the people stand by the order characteristic of the constitution, and that no faction even worth speaking about has arisen among them, and no tyrant either.

This constitution has elements that are much the same as in the Spartan constitution. The messes of the *hetairiai* are like the *phiditia*, while the office of the one-hundred-and-four is like that of the overseers, except that it is not worse (for the overseers are drawn from random people, while the Carthaginians elect to this office on the basis of worth). And their kings and senate are analogous to the Spartan ones. Also, it is better that the kings are neither a separate family nor a random one at that, but if any family distinguishes itself, then it is from its members that they are elected, rather than in accord with age. For, since they control the important matters, if they are worthless people, they will do great harm to the city—as they already have to the city of the Spartans. **1273^{a}1**

Most of the criticisms one might make because of the deviations [from the best constitution] are in fact common to all the constitutions mentioned. But of those that are deviations from the hypothesis of an aristocracy or a polity, some lean more in the direction of democracy, others more in the direction of oligarchy. For the kings and senators control what to bring and what not to bring before the people, provided they all agree, but if they do not agree, the people control these matters too. And when the rulers make proposals, the people are allowed not only to hear their proposals out, but also have control of deciding them, and anyone who wishes may speak against the proposals being made—which is precisely what does not exist in the other constitutions.

On the other hand, it is oligarchic that the boards of five, which control many and important matters, elect themselves, and also elect to the office of one-hundred,[85] which is the most important office, and further, hold office longer than the others (for they rule before taking office and after they have left it). But one must count as aristocratic the fact that they are neither paid nor chosen by lot, and anything else of that sort, and also that all suits are judged by the boards of five, and not, as in Sparta, some by some and others by others.

However, the order characteristic of the Carthaginians deviates away from aristocracy and toward oligarchy most of all in line with a thought held also by ordinary people; for they think that rulers should be chosen not solely on the basis of merit but also on the basis of wealth; for it is impossible for a poor person to rule well—that is, to be at leisure to do so. Hence, if indeed it is oligarchic to choose rulers on the basis of wealth, and aristocratic to choose them in accord with virtue, then this will be a third sort of order, in accord with which the Carthaginians have ordered matters relating to the constitution; for they elect with a view to both [criteria], especially in the case of the most important offices, the kings and the generals.

But this deviation from aristocracy must be regarded as an error on the part of the legislator. For one of the most necessary things to see to from the start is that the best people are able to be at leisure and to avoid doing anything unseemly, not only when in office but also in private life. But if one must look to wealth too, for the sake of leisure, it is bad that the most important offices, those of king and general, should be for sale. For this law makes wealth more estimable than virtue, and makes the entire city money-loving, and whatever it is that the controlling element [of the city] takes to be estimable, the belief of the other citizens will necessarily follow its belief. And where virtue is not esteemed most highly, the constitution cannot be stably governed as an aristocracy. It is also reasonable to expect that those who have bought office, that is, when they rule by having spent money, will become habituated to making a profit from it; for if a poor but decent person will want to profit from office, it would be strange if a worse one, who has already spent money, will not wish to do so. That is why those who are best able to rule[86] should rule. And even if the legislator neglected the wealth of the decent people, he had better take care of their leisure, at any rate, while they are ruling.

It would also seem to be bad for the same person to hold more than one office, which is precisely what is held in high repute among the Carthaginians; for one work is best completed by one person. The legislator should see to it that this is what happens, and not require the same person to play the pipe and make shoes. So, where the city is not small, it is more suited to political rule, and more democratic, if more people participate in the offices; for it is more communal, as we said, and each of the same things is better carried out and more quickly. This is clear in the case of military

85. I.e., the office of the one hundred and four (1272b34–35).
86. Reading ἄρχειν.

and naval affairs; for in both of them ruling and being ruled extend through (one might almost say) everyone.

But though their constitution is oligarchic, they are very good at escaping faction, because it is forever the case that some part of the people grows rich due to their sending it out to the [dependent] cities. In this way they effect a cure and make their constitution steadfast. But this is the result of luck, while they should be free of factional conflict because of the legislator. As things stand, however, if some misfortune occurs and the multitude of those who are ruled revolt, there is no remedy for restoring peace through the laws.

As regards the Spartan, Cretan, and Carthaginian constitutions, which are quite justly held in high repute, this is the way things stand.

2.12
The Constitution of Solon and Other Legislators

Some of those who have had something to say about a constitution took no part whatever in political actions, but always lived a private life. About them pretty much everything worth saying has been said. Others became legislators, some for their own cities, others for some foreign ones as well, because they engaged in politics themselves. Some of these crafted laws only, while others, such as Lycurgus and Solon, crafted a constitution too; for these put in place both laws and constitutions.

The Spartan constitution has already been spoken about,[87] and, as for Solon, some people think that he was an excellent legislator because he abolished an oligarchy that was too unmixed, put an end to the slavery of the people, and put in place the ancestral democracy, by mixing the constitution well—for the council of the Areopagus is oligarchic, the fact that officials are elected is aristocratic, and the courts are democratic. It would seem that Solon found the first two—the council and the election of officials—already in existence and did not abolish them, while by making juries open to all, he did set up the people [in power].

That is why indeed some people find fault with him; for they say that when he gave juries, which were chosen by lot, control of everything, he undid the other two [elements of the constitution]. For when this element became strong, those who gratified the people as if it were a tyrant changed the constitution into the present democracy. Indeed, Ephialtes and Pericles curtailed the power of the Areopagus, and Pericles introduced payment for judges, and in this way each popular leader developed the power of the people and led them on to the present democracy.

It appears, however, that this did not come about in accord with Solon's deliberate choice, but rather by accident (for because the people were the cause of Athens' naval supremacy during the Persian Wars, they became presumptuous, and chose

87. 2.9.

base people as their popular leaders when the decent ones proposed policies opposed to their own), since Solon, at any rate, seems to have given the people only the very minimum power necessary—that of electing and inspecting officials (for if they do not even control these, the people would be slave and enemy [of the constitution]), but drew all the officials from among the notable and rich: the five-hundred bushel-men, the yoke-men, and the third, the so-called cavalrymen, while the fourth, the day-laborers,[88] had a share in no office.

Others also became legislators: Zaleucus became legislator for the Epizephyrian Locrians, and Charondas of Catana for his own citizens and for the other Chalcidian cities in Italy and Sicily. (Some people actually try to connect them, on the supposition that Onomacritus, a Locrian, was the first person to become an expert in legislation, having been trained in Crete when he visited there in connection with his craft of divination, that Thales was his companion, and that Lycurgus and Zaleucus were pupils of Thales, and Charondas of Zaleucus. But when they say these things, they speak without regard to chronology.)

There was also Philolaus the Corinthian, who became a legislator for the Thebans. He was a member of the Bacchiad family and became the lover of Diocles, the victor in the Olympic Games. This Diocles left the city of Corinth because of his bitter hatred of the sexual passion that his mother, Alcyone, had for him, and went off to Thebes, where he and Philolaus both ended their days. Even now people point out their tombs, which are in full view of each other, although one has a view toward the land of the Corinthians, while the other does not; for the story goes that they arranged to be buried in this way, Diocles, because of his hatred of [his mother's passion], so that the land of Corinth would not be visible from his burial mound, Philolaus so that it would be visible from his. It was due to this sort of cause, then, that the two of them dwelt among the Thebans. Philolaus became legislator for them both on other matters and concerning procreation (which they call "the laws of adoption"). This is special to his legislation, its purpose being to preserve the [same] number of estates.

There is nothing special to Charondas' legislation except suits for perjury (for he was the first to introduce denunciations for this). But in the exactness of his laws, he is more polished than even present-day legislators.

The feature special to Phaleas is the leveling of property—while to Plato it is the sharing of women, children, and property, communal messes for women, and further, the law about drinking, that the sober should preside at symposia, and the one requiring ambidextrous training for soldiers, on the grounds that one of the hands should not be useful and the other useless.

There are also Draco's laws, but it was for an existing constitution that he set up laws. There is nothing special to his laws worth speaking about, except their harshness due to the magnitude of the punishments.

88. Cf. *Ath*. 7.3–4.

Pittacus too crafted laws but not a constitution. A law special to him requires drunken people to be punished more severely, if they make a misstep, than sober ones. For because more people commit acts of wanton aggression when drunk than when sober, Pittacus looked not to the fact that greater indulgence should be shown to those who are drunk but to what is advantageous.

Androdamus of Rhegium became a legislator for the Chalcidians in the region of Thrace, and to him belong those dealing with homicides and heiresses. But there is nothing special to him that one might report.

As regards the various constitutions, then, both those that have control [in actual cities] and those described by certain people, let this be the way to get a theoretical grasp on them.

BOOK 3

3.1
City and Citizen

For someone investigating constitutions, that is, what each is and what sort of thing it is, pretty much the first investigation concerns the city, to see what exactly the city is. For as things stand, there are disputes about this, some saying that it is the city that performed a certain action, while others say that it is not the city, but rather the oligarchy or the tyrant. And we see that the politician's and the legislator's entire study concerns the city, and that the constitution is itself a certain ordering of those who inhabit the city. But since the city belongs among composite things, and things that are wholes and composed of many parts, it is clear that the first thing that must be investigated is the citizen; for a city is a particular sort of multitude of citizens. So who should be called a "citizen," and what the citizen is, must be investigated. For in **1275^{a}1** fact there is often a dispute about the citizen as well; for not everyone agrees that one and the same person is a citizen; for someone who is a citizen in a democracy is often not one in an oligarchy.

One must leave aside those who acquire the title of citizen in some other way—for example, the ones who are created citizens. Nor is the citizen a citizen through dwelling in a place (for both resident aliens and slaves share the dwelling place). Nor are those people citizens who share in matters of justice to the extent of undergoing trial or suing (for parties to treaties can also do that). In fact in many places not even resident aliens share completely in these things, but must find a "champion," so that they participate in this sort of community in an incomplete sort of way. Like children who are too young to be registered [as citizens] or old people who have been discharged, these people must be said to be citizens in a way, not unconditionally so, but rather with the addition of "incomplete" or

"superannuated" or something else of this sort (it makes no difference; for what is meant is clear). For we are inquiring about the unconditional citizen, the one who has no defect of this sort that needs to be rectified, since one can also go through and solve similar puzzles about those who have been disenfranchised or exiled.

The unconditional citizen is defined by nothing else so much as by his participation in judgment and office. But some offices are determined with respect to time, so that in some cases they cannot ever be held twice by the same person, or only after a definite period. Another [officeholder], however, holds office indefinitely, such as the judge or the assemblyman. Perhaps someone might say that the latter are not officials at all, and do not, because of doing what they do, share in office. And yet surely it would be absurd to deny that those with the most control are officials. But let this point pass; for the argument is about a name. For what is common to a judge and an assemblyman lacks a name that could apply to both. For the sake of determining it, then, let us call it "indefinite office." We take it, then, that those who share in office in this way are citizens.

So the definition that best fits all those called "citizens" is pretty much one of this sort. But one must not overlook the fact that in the case of things in which the underlying subjects differ in form, with one coming first, another second, and so on, either the common element is not present at all, insofar as these things are what they are, or only in some rudimentary way. We see that constitutions differ in form from each other, and that some are posterior and others prior; for erroneous or deviant constitutions are necessarily posterior to those that are not erroneous. (What we mean by "deviant" will be evident later on.[89]) So it is necessary for the citizen in the case of each constitution to be different too.

That is why the citizen that was mentioned is above all a citizen in a democracy, and may possibly be so in other constitutions, but not necessarily. For in some constitutions there is no democratic body, nor is there a legally recognized assembly, but rather [specially] summoned councils, and judicial cases are tried in special courts. For example, in Sparta some cases concerning contracts are tried by one overseer, others by another, while cases of homicide are tried by the senate, and other cases by perhaps some other official. And it is the same way in Carthage; for there particular officials judge all judicial cases.

But our definition of a citizen admits of correction. For in the other constitutions, it is not the holder of indefinite office who is assemblyman and judge, but someone whose office is definite; for it is either to some or to all of the latter that deliberation and judgment, whether about some or about all matters, is assigned.

Who the citizen is, then, is evident from these considerations; for whoever is authorized to share in deliberative or[90] judicial office, we can now say, is a citizen of

89. 3.6–7.
90. Reading ἢ.

the relevant city, and a city, simply speaking, is a multitude of such people adequate for self-sufficiency in living.

3.2
Pragmatic Definitions of the Citizen

But the definition that gets used in practice is that a citizen is someone who comes from citizens on both sides, and not just on one—for example, on the father's or on the mother's. And some go even further back, looking for two or three or more generations of ancestors. But quick,[91] political definitions of this sort lead some people to raise a puzzle about how that third- or fourth-generation ancestor will be a citizen. Hence Gorgias of Leontini, half perhaps to raise a real puzzle and half in jest, said that just as mortars are things made by mortar-makers, so Larissaeans too are what are made by craftsmen; for some craftsmen are Larissaean-makers.[92] But the puzzle is a simple one. For if the ancestors shared in the constitution in the way that is in accord with the definition just given, they were citizens; for "what comes from a citizen father or mother" cannot even be applied to the first inhabitants or founders.

But more of a puzzle is perhaps raised by the case of those who come to share in a constitution after its being changed, such as the citizens created in Athens by Cleisthenes[93] after the expulsion of the tyrants; for he adopted many foreigners and alien slaves into the tribes. But the dispute in the case of these people is not about which of them is a citizen, but whether they are justly or unjustly so. And yet a further puzzle might be raised as to whether someone who is not justly a citizen is not a citizen at all, as "unjustly" and "falsely" seem to have the same force. But since we **1276^{a}1** see that there are also some people holding office unjustly, whom we say are holding it, albeit not justly, and since a citizen is defined by his holding a sort of office (for someone who shares in office of this sort is a citizen, as we said), it is clear that these people too must be said to be citizens.

3.3
The Identity of a City

The puzzle about justly and not justly is connected to the dispute mentioned previously.[94] For some people raise a puzzle about how to determine when a city has or has not performed an action—for example, when from an oligarchy or a tyranny a democracy comes about. At these times, some do not wish to honor treaties, as it

91. Reading ταχέως.
92. A Larissaean was both a citizen of Larissa and a type of pot made there.
93. *Ath.* 20.1–22.1, 29.3, 41.2.
94. 1274^{b}34–36.

was not the city, but its tyrant who entered into them, or many other things of the same sort, on the grounds that some constitutions exist by the exercise of power and not because of being for the common advantage. If indeed, then, some cities are democratically ruled in this way, it must be conceded that the actions of this constitution are the actions of this very city in the same way as those of the oligarchy or the tyranny.

This argument seems to be akin to the puzzle of when one is to say that a city is the same, or not the same but a distinct one. The most obvious way to inquire about this puzzle is by looking to the location and the human inhabitants; for it is possible for a city's location and its human inhabitants to come apart, and for some to live in one place and some in another. That is why the puzzle must be counted as a rather tame one (for the fact that something is said to be a city in many ways makes inquiry about such puzzles in a way easy).

Things are similar if one asks when the people inhabiting the same location should be considered to be one city. Not, certainly, because it is enclosed by walls; for one wall could be built around the Peloponnese. Perhaps Babylon is like this, or anywhere else that has the dimensions of a nation rather than a city. At any rate, they say that after its capture a part of the city was not aware of it for three days.

But it will be useful to investigate this puzzle on another occasion[95] (for the size of the city, both as regards numbers and as regards whether it is advantageous for it to have one[96] or several [locations], should not be overlooked by the politician).

But where the same human beings are inhabiting the same place, is the city to be called "the same" as long as the inhabitants remain of the same stock, even though all the time some are passing away and others coming to be—just as we are accustomed to say that rivers and springs remain the same, even though all the time water is flowing in and flowing out? Or is one to say that while human beings can remain the same due to this sort of cause, the city is different? For if indeed a city is a sort **1276b1** of community, a community of citizens sharing in a constitution, then, when the constitution becomes another one in form, that is, becomes different, it would seem that the city too is not the same. At any rate, just as we say that a chorus that is at one time comic and at another tragic is a different chorus, even though the human beings in it are often the same. In the same way too any other community or composite is different if the form of the composite is different—for example, we say that a harmony composed of the same notes is a different harmony if it is at one time Dorian and at another Phrygian. If, then, this is how things are, it is evident that a city must be said to be the same city by looking above all to its constitution. But the name to call it may be different or the same one whether its inhabitants are the same or altogether distinct human beings.

95. 7.6.
96. Secluding ἔθνος.

But whether it is just to honor or not to honor agreements when a city changes to a different constitution requires another argument.

3.4
Virtues of Man and Citizen, Rulers and Ruled

Connected with the issues just now discussed is the investigation of whether to count the virtue of a good man and of an excellent citizen as the same or not the same. But then if this is what the investigation should be about, surely the virtue of a citizen must first be grasped in some sort of outline.

Just as a sailor is one of the members of a community, so too, we say, is a citizen. And though sailors are dissimilar in their capacities (for one is an oarsman, another a captain, another a lookout, and others have other sorts of titles), it is clear both that the most exact account of the virtue of each sort of sailor will be special to him and that there will also be some common account that fits them all alike. For the preservation of the ship while sailing is a work of all of them; for this is what each of the sailors desires. In the same way, then, the citizens too, even though they are dissimilar, have the preservation of the community as their work, and the constitution is the community. That is why the virtue of a citizen must be relative to the constitution. If, then, there are indeed several forms of constitutions, it is clear that there cannot be one virtue that is the virtue of an excellent citizen: complete virtue. But the good man, we say, is such in accord with one virtue, the complete one. It is evident, then, that it is possible for someone to be an excellent citizen without having acquired the virtue in accord with which someone is an excellent man.

By going through the puzzles in a different way, the same argument can be made about the best constitution. For if it is impossible for a city to be composed entirely of those who are excellent, but each must at least do his own intrinsic work well, and this is doing it out of virtue, and since it is impossible for all the citizens to be similar, then there cannot be one virtue of a citizen and of a good man. For that of an excellent citizen must belong to all (for this is necessary if the city is to be best), but the virtue of a good man cannot be had by all, unless it is necessary for all the citizens in an excellent city to be good men.

Further, since a city consists of dissimilar inhabitants (that is, just as an animal straightaway consists of soul and body, a soul of reason and desire, a household of man and woman, and property of master and slave, so a city too consists of all these, and of other dissimilar forms in addition), the virtue of all the citizens cannot be one virtue, just as the virtue of the leader of a chorus and that of one of its ordinary members cannot be one virtue either.

Why the virtue of man and of a citizen are not unconditionally the same, then, is evident from these considerations, but will the virtue of a certain sort of excellent citizen and that of an excellent man be the same? We say that an excellent ruler is good

and practically wise, but it is not necessary for a citizen to be practically wise. Also, some say that the education of a ruler is different right from the start—as is evident in the case of the sons of kings, who are educated in horsemanship and warfare, and in Euripides, when he says, "No subtleties for me . . . but what the city needs" (the supposition being that there is a sort of education proper to a ruler). But if the virtue of a good ruler and of a good man is the same, and if the one who is ruled is also a citizen, then the virtue of a citizen would not be unconditionally the same as that of a man (although that of a certain sort of citizen would be); for the virtue of a ruler and a citizen would not be the same. Perhaps that is why Jason said that he went hungry except when he was being a tyrant, on the assumption that he lacked the scientific knowledge of how to be a private citizen.

But then someone is surely praised for being able to rule and be ruled, and being able to do both of them well seems to be the virtue of a reputable citizen. If, then, we take a good man's virtue to be ruling virtue, but a citizen's to be both ruling and ruled, then the two virtues would not be praiseworthy in the same way.

Since, then, they seem to be distinct in some cases, and that it is not the same things that should be learned by the ruler and the ruled, while a citizen should have scientific knowledge of both and share in both, one may see what follows from that.

For there is rule of a master—by which we mean the sort concerned with the necessities. It is not necessary for the ruler to have scientific knowledge of how to perform these [works], but rather of how to use [those who do]. In fact, the former is slavish. (By "the former" I mean the capacity to do in someone's service the actions of a servant.) But there are several forms of slave, we say; for the sorts of work they do vary. Among these, one part is that done by manual laborers. These are people, as their name itself signifies, who live by their hands. The unrefined craftsman is included among them. That is why among some peoples craftsmen did not share in office in former times, until extreme democracy arose. Thus the works performed by people ruled in this way should be learned neither by the good politician nor by the[97] good citizen, unless for himself out of some need of his own; for then it is no longer a case of one person becoming master and the other slave.

But there is also a sort of rule exercised over those who are similar in kind and free. For this is what we say is political rule, and the ruler must learn it by being ruled, just as one learns to be a cavalry commander by serving under a cavalry commander, to be a general by serving under a general, and [similarly] under a major, or company commander. That is why this too is well said[98] that one cannot rule well unless one has been ruled. And while the virtues of these are distinct, the good citizen must have the scientific knowledge needed and the ability both to be ruled and to rule, and this is the virtue of a citizen, to know the rule of free people from both sides.

97. Retaining οὐδὲ τὸν.
98. Solon (DL 1.60, 174–175).

In fact, the good man has both virtues, even if a distinct form of justice and temperance is characteristic of a ruler. For if in fact a good man is ruled, but is a free citizen, it is clear that his virtue (justice, for example) is not one thing, but includes one form for ruling and another for being ruled, just as a man's and a woman's temperance and courage are distinct (for a man would seem a coward if he were courageous in the way a woman is courageous, and a woman would seem garrulous if she were moderate in speech in the way a good man is, since even household management is of distinct sorts for a man and a woman; for his work is to acquire property and hers to preserve it). Practical wisdom, by contrast, is the only virtue special to a ruler. For the others, it would seem, must be common to both rulers and ruled. At any rate, the virtue of someone ruled is not practical wisdom but true belief; for those ruled are like makers of pipes, while rulers are like the pipe players who use them.

Whether, then, the virtue of a good man and that of an excellent citizen are the same or distinct, and in what way they are the same and in what way distinct, is evident from these considerations.

3.5
Should Craftsmen Be Citizens?

One of the puzzles about the citizen still remains. For is it really the case that a citizen is someone to whom it is open to have a share in office, or must unrefined craftsmen also be counted as citizens? If, indeed, those who do not share in office must be counted as citizens, the sort of virtue we discussed cannot belong to every citizen (for these craftsmen will then be citizens). On the other hand, if none of these sorts is a citizen, in which part of the city must they each be put? For they are neither resident alien nor foreigner.

Or will we say that nothing absurd follows—at any rate, not because of this argument? For slaves and freed slaves are not among those just mentioned, either. **1278^{a}1** In fact, the truth is that not everyone without whom there would not be a city is to be counted as a citizen, since not even children are citizens in the same way that men are. Instead, the latter are unconditional citizens, while the former are so on the basis of a hypothesis; for though they are citizens, they are incomplete ones. Among some peoples in ancient times the unrefined element was slave or foreign, which is why most of them are such even now. And the best city will not confer citizenship on an unrefined person. But if [in other cities] even this sort of person is a citizen, then what we have said is a citizen's virtue must not be ascribed to everyone, or even to all free people, but only to those who are released from the necessary works. Among the necessary ones, those who perform services of this sort for an individual are slaves; those who perform them for the community are unrefined and hired laborers.

It will become evident, if we carry our investigation a little further, how things stand with these people. For what has been said[99] makes this clear. For since there are several constitutions, there must also be several forms of citizen, and above all of citizens who are being ruled, so that in some constitutions the unrefined element and the hired laborer must be citizens, while in others it is impossible—for example, in any so-called aristocracy, that is, one in which offices are awarded in accord with virtue and in accord with worth; for it is impossible to engage in virtuous pursuits while living the life of an unrefined person or a hired laborer.

In oligarchies, on the other hand, while it is not possible for hired laborers to be citizens (for participation in offices is based on high property assessments), it is possible for an unrefined person; for in fact many craftsmen become rich. (In Thebes there used to be a law that anyone who had not kept away from the market for ten years could not share in office.)

But in many constitutions the law goes so far as to invite even some foreigners to be citizens; for in some democracies the descendant of a citizen mother is a citizen, and in many places the same holds of bastards too. Nonetheless, since it is because of a shortage of legitimate citizens that they make such people citizens (for it is because of underpopulation that they employ laws in this way), when they are well supplied with a mob of them, they gradually disqualify, first, those with a slave as father or mother, then those with citizen mothers [alone], until finally they make citizens only of those who come from citizens on both sides.

It is evident from these considerations, then, that there are several forms of citizens, and that the one who is above all said to be a citizen is the one who shares in the honors of office, as Homer too implied when he wrote, "like some dishonored vagabond";[100] for the one who does not share is like a resident alien. And whenever this sort of thing is kept concealed, it is for the sake of deceiving fellow inhabitants.

And whether, then, to count the virtue in accord with which a man is good and a citizen is excellent as the same or as distinct is clear from what has been said: in one sort of city the good man and the excellent citizen are the same, while in another they are distinct. And that man is not just anyone; rather, he is the politician, that is, the one who controls or is capable of controlling, either by himself or with others, the supervision of community affairs.

3.6
Correct and Deviant Constitutions

Since these issues have been determined, what comes after this must be investigated, whether one must take it that there is one constitution or several, and, if there are several, what they are, how many they are, and how they differ.

99. 3.1.
100. *Iliad* 9.648, 16.59.

A constitution is an ordering of a city and of its various offices, and above all of the office that controls everything. For in every case the governing body controls the city, and the constitution is the governing body. I mean, for example, that in democratic cities the people are in control, while in oligarchic ones, on the contrary, the few are. And we say that the constitution too is different in these cases. And we will state the same account about the others as well.

First, then, it must set down what a city is set up for, and how many forms of rule are concerned with human beings and their community in living.

In our first discussions, then, where determinations were made about household management and rule of a master, it was also said that a human being is by nature a political animal.[101] That is why, even when they do not need each other's assistance, people desire no less to live together. Nonetheless, it is also true that the common advantage brings them together, to the extent that some share of noble living falls to each. It is especially this, then, that is the end both of all communally and of each separately. But they also come together and maintain the political community for the sake of living itself. For there is presumably some share of the noble present even in living itself alone, as long as the hardships in life are not too excessive. In any case, it is clear that most human beings are willing to endure much misery in order to cling to living, on the supposition that there is a sort of joy in it and a natural sweetness.

But then it is also easy to distinguish, at any rate, the modes of rule that are spoken about, since even in the external accounts they are often discussed. For rule of a master, although in truth the same thing is advantageous for both what is by nature a master and what is by nature a slave, is nonetheless rule exercised with a view to the master's own advantage, though coincidentally with a view to that of the slave (for if the slave is destroyed, the mastership cannot be preserved).

On the other hand, rule over children, wife, and the household (*oikia*) generally, which we call "household management (*oikonomikê*)," is either for the sake of the ruled or for the sake of something common to both ruled and ruler. Intrinsically, it is for the sake of the ruled, as we also see in the various crafts (for example, medicine and athletic training), but coincidentally it may be for the rulers as well. For nothing **1279^{a}1** prevents a coach from sometimes being one of those being trained, just as a ship's captain is always one of the sailors. A coach or a ship's captain looks to the good of the ruled, but when he too becomes one of them himself, he shares coincidentally in the benefit. For in the one case he is a sailor, and in the other, though still a coach, he becomes one of the trained.

That is why, in the case of political offices too, where they have been set up in accord with the equality of the citizens and their similarity, the citizens expect to rule in turns. In the past, as is natural, they expected to perform public service when their turn came, and then to have someone else look to their good in turn, just as they had previously looked to his advantage when they were ruling. Nowadays, however,

101. 1253^{a}7–8.

because of the benefits to be had from public funds and ruling office, people wish to rule continuously, as if being always healthy resulted for those sick people who [always] rule. At any rate, the latter would presumably pursue ruling office in that sort of way.

It is evident, therefore, that those constitutions that aim at the common advantage are, in accord with what is unconditionally just, correct, while those that aim only at the advantage of the rulers are erroneous, and deviations from the correct constitutions; for they are like the rule of a master, while a city is a community of free people.

3.7
The Classification of Constitutions

Now that these matters have been determined, the next thing is to investigate how many constitutions there are and what they are, starting with the correct ones; for in fact the deviations will be evident once these have been defined.

Since constitution and governing body signify the same thing, and the governing body is what has control in cities, and the one in control must be either one person, or few, or many, then, whenever the one, the few, or the many rule with a view to the common advantage, these constitutions must be correct, while those that do so with a view to the private advantage, whether of the one, the few, or the multitude, they are deviations. For either those who share[102] must not be called "citizens," or they should share in the advantages.

Among monarchies, the one that looks to the common advantage is usually called a "kingship," and rule by a few, but more than one, an "aristocracy" (either because the best people rule, or because they rule with a view to what is best for the city and those who share in it), while when the multitude governs with a view to the common advantage, the constitution is called by the name "polity (*politeia*)," which is common to all constitutions (*politeiai*). Moreover, this happens reasonably; for while it is possible for one or a few to be superior in virtue, in the case of more people it is already difficult for them to be exact practitioners of every sort **1279b1** of virtue—the major exception being military virtue; for this does come about in a multitude. That is why in this constitution the element that goes to war on its behalf is the one with the most control, and why those who possess their own weapons are the ones who share in it.

Deviations from the ones mentioned are tyranny from kingship, oligarchy from aristocracy, and democracy from polity. For tyranny is monarchy with a view to the advantage of the monarch, oligarchy with a view to the advantage of the rich, and democracy with a view to the advantage of the poor. But none of them is for the common profit.

102. Rejecting the addition of μὴ.

3.8
Defining Oligarchy and Democracy

But it is necessary to say a little more about what each of these constitutions is; for certain puzzles are involved, and, in the case of each methodical inquiry, it is appropriate for the person who is carrying it out in a philosophical manner, and not merely with a practical purpose in view, not to overlook or omit anything, but to make clear the truth about each.

A tyranny, as was said, is a monarchy that exercises the rule of a master over the political community, an oligarchy is when those who control the constitution are the ones who have the properties, and a democracy, on the contrary, is when those who control it do not have much property, but are poor.

The first puzzle concerns definition. For suppose that the majority were rich and controlled the city, and that it is a democracy whenever the majority has control. In the same way again suppose that the poor are fewer in number than the rich, but are stronger and control the constitution, but that when a small group is in control it is said to be an oligarchy. It would seem, then, that these constitutions have not been correctly defined.

But then even if one were to combine being few with being rich, in the one case, and being a majority with being poor, in the other, and to describe the constitutions accordingly—oligarchy as that in which the rich are few in number and hold the offices, and democracy as that in which the poor are many and hold them—another puzzle arises. For what are we to call the constitutions we just described, those where the rich are a majority and the poor a minority, but each controls in its own constitution, if indeed there is no other constitution besides those mentioned?

What this argument seems to make clear, therefore, is that it is coincidental that the few or the many are in control in oligarchies or in democracies, and that this is because the rich are everywhere few and the poor many. That is why, in fact, the causes just mentioned are not the causes of any differences between the constitutions. What does differentiate democracy and oligarchy from each other is poverty and wealth, that is, whenever some, whether a minority or a majority, rule because of their wealth, the constitution is necessarily an oligarchy, and whenever the poor rule, it is **1280^{a}1** necessarily a democracy. But it turns out, as we said, that the former are in fact few and the latter many. For only a few people are rich, but in freedom all share. And it is due to these causes that both groups dispute over the constitution.

3.9
Justice and the End of the City

The first thing one must grasp, however, is what they say the defining marks of oligarchy and democracy are, and what both oligarchic justice and democratic justice are.

For all grasp a sort of justice, but they only go to a certain point and do not discuss the whole of what is just in the strictest sense. For example, justice seems to be equality, and it is—not for everyone, however, but for equals. Justice also seems to be inequality, and in fact it is—not for everyone, however, but for unequals. They do away with this—the for whom—and so judge badly. The cause is that the judgment concerns themselves, and pretty much most people are bad judges about their own affairs.

So, since what is just is just for certain people, and consists in dividing both things and people in the same way (as was said previously in the *Ethics*[103]), they agree about equality in the thing but disagree about the for whom. This is mostly because of what was just mentioned, that they judge badly about what concerns themselves, but also because, by both of them speaking up to a point about a sort of justice, they consider themselves to be speaking about justice unconditionally. For one lot, if they are unequal in one respect (for example, wealth), think that they are wholly unequal, while the other lot, if they are equal in one respect (for example, freedom), think that they are wholly equal. About what has the most control, however, they do not speak. For if it were for the sake of property that people formed a community and came together, then they would share in the city to the extent that they shared in property, and the oligarchic argument would as a result seem to be a strong one; for [they would say] it is not just for someone who has contributed one mina to share equally in a hundred minas with the one who has contributed all the rest, whether of what was there at the start or of the interest.

But they do not do these things only for the sake of living, but more for the sake of living well; for otherwise there could also be a city of slaves and of the other animals, while as things stand there is not one, because these share neither in happiness nor in living in accord with deliberate choice.

Nor do they do them for the sake of an alliance, to safeguard themselves from being treated unjustly by anyone, or because of exchange and their usefulness to each other—for otherwise in fact the Etruscans, the Carthaginians, and all those who have treaties with each other would be like citizens of one city. At any rate, they have import agreements, treaties about not doing injustice, and formal documents of alliance. No offices, however, that are common to all of them have been put in place to deal with these matters, but rather each city has distinct ones. Nor are those in one city concerned that those in the other should be of a certain quality, not even that those covered by the agreements should not be unjust or depraved in any way, but only that they should not act unjustly toward each other. By contrast, political virtue and vice are closely investigated by those concerned with good legislative order. Thus it is quite evident that the city must be concerned with virtue—at any rate, the city that is truly, and not just for the sake of argument, so called. For otherwise the community becomes

103. *NE* 5.5.

an alliance, differing only in location from the other alliances in which the allies live far apart, and law becomes an agreement, and, as Lycophron the sophist said, "a guarantor of just behavior toward each other," but not such as to make the citizens good and just.

It is evident that this is the way it is. For even if their territories were brought together into one, so that the city of the Megarians and that of the Corinthians were fastened together by surrounding walls, it still would not be a single city. Nor would it be so if their citizens intermarried, and yet this is one of the sorts of community that is special to cities. Nor, similarly, if there were some who lived in separate places, yet not so far apart as to share nothing communally, and had laws against doing injustice to each other in their business transactions (for example, if one were a carpenter, another a farmer, another a shoemaker, another something else of that sort, and their number were ten thousand), yet their community was in nothing else besides such things as exchange and alliance—not even in this case would there be a city.

What, then, is the cause of this? Surely, it is not because of the non-proximity of their community. For even if, while forming a community of this sort, they came together, yet each treated his own household like a city and the others as if a defensive alliance existed, coming to their aid only against those committing injustice—even so, they still would not seem to be a city to those who get an exact theoretical grasp on such things, if indeed they continued to associate with each other in the same manner when together as they did when separated.

It is evident, therefore, that a city is not a community of location, nor one either for the sake of preventing mutual injustice or for the sake of exchange. On the contrary, while these must be present if indeed there is to be a city, when all of them are present it is nonetheless no city yet. Rather, the city is the community in living well for both households and families, that is, for the sake of complete and self-sufficient living. But in fact this will not be possible unless they inhabit one and the same location and practice intermarriage. That is why marriage connections arose in cities, as well as brotherhoods, religious sacrifices, and the pastimes characteristic of living together. And things of this sort are the work of friendship; for the deliberate choice to live together is friendship. The end of the city is living well, then, but these other things are for the sake of the end. And the city is the community of families and villages in complete and self-sufficient living, which we say is living happily and nobly. **1281^{a}1**

So political communities must be counted as being for the sake of noble actions, not for the sake of living together. That is why those who contribute the most to this sort of community have a larger share in the city than those who are equal or superior in freedom or family but unequal in political virtue, and those who are superior in wealth but inferior in virtue.

That all those who dispute about constitutions, then, speak about a part of justice is evident from what has been said.

3.10
Control of the City

There is a puzzle as to which part is to be in control of the city. For surely it is either the majority, the rich, the decent people, the one who is best of all, or a tyrant. But all of these apparently involve difficulties. For what if the poor, because they are the majority, divide up the property of the rich—is this not unjust? "Well, by Zeus, it seemed just to the body in control." But what then is one to say the ultimate injustice is? Again, if the majority, having seized everything, divides up the property of the minority, it is evident that they are destroying the city. But surely virtue does not destroy what has it, nor is justice something capable of destroying a city. So it is clear that this law cannot be just. Further, [it would follow that] it is necessary for all the actions done by the tyrant to be just too; for he, being stronger, uses force, just as the majority do against the rich.

Then is it just for the minority and the rich to rule? If they act in the same way, plundering and confiscating the property of the majority, and this is just, then the other case is as well. It is evident, therefore, that all these things are bad and unjust.

Then should the decent people rule and have control of everything? In that case, everyone else will necessarily be deprived of honors, since they are denied the honors of holding political office; for offices are positions of honor, we say, and when the same people always rule, the rest will necessarily be deprived of honor.

Then is it better that the one who is most excellent should rule? But this is even more oligarchic; for those deprived of honors will be more numerous.

But perhaps someone might say that it is a bad thing in general for a human being rather than the law to be in control, since, at any rate, he has the feelings that arise in the soul. But if law is oligarchic or democratic, what difference will it make in the case of the puzzles that were raised? For the things we have described will happen all the same.

3.11
Majority Control?

As for the other cases, let them be the subject of some other account. But the view that the majority rather than those who are the best people, although few, should be in control would seem to be [one] to resolve[104] and to involve some puzzlement, but perhaps also some truth. For the many, each of whom individually is not an excellent man, nonetheless may, when they have come together, be better than the few best people, not individually but collectively, just as feasts to which many contribute are better than feasts provided at one person's expense; for, being many, each can have

104. Reading λύεσθαι.

some part of virtue and practical wisdom, and when they come together, the multitude is just like one human being, with many feet, many hands, and many perceptual modalities, and so too for their characters and thought. That is why the many are also better judges of works of music and of the poets; for distinct ones are better judges of distinct parts, and all of them are better judges of all the parts.

Indeed, it is in this respect that excellent men differ from each of the many, just as noble people are said to differ from those who are not noble, and the things in paintings produced by craft knowledge from real things, by bringing together what is scattered and separate into one—even though, if taken separately, at any rate, this person's eye and some other feature of someone else will be more noble than the painted ones.

Whether it is in the case of every people and every multitude that this superiority of the majority to the few excellent people can exist is not clear. Although, by Zeus, it presumably is clear that in some of them it cannot possibly do so. (For the same argument would apply to wild beasts; and yet what difference is there, one might ask, between some people and wild beasts?) But there is nothing to prevent what has been said from being true of some multitude.

That is why, by means of these considerations, one might also resolve the puzzle mentioned previously as well as the one connected to it, of what the free and the multitude of citizens—those who are not rich and have no claim whatever to virtue—should control. For to have them share in the most important offices is not safe (for, because of their injustice and foolishness, they would of necessity act unjustly in some instances and make errors in others). On the other hand, neither to give a share nor have a share is a fearful thing (for when there is a large number of people deprived of honors and poor, that city is necessarily full of enemies). The remaining alternative, then, is to have them share in deliberation and judgment. That is why Solon and some other legislators arrange to have them elect and inspect officials, but do not allow them to hold office individually. For when they all come together their perception is adequate, and, when mixed with their betters, they benefit their cities, just as a mixture of impure nourishment with the pure sort makes the whole thing more useful than a little [of the latter]. Taken separately, however, each of them is incomplete as regards judging.

But this order characteristic of the constitution itself raises puzzles. In the first place, it might seem that it belongs to the very same person to judge whether someone has treated a patient correctly, and to treat patients, that is, to cure them of their present disease—the doctor. And the same would also seem to hold in other areas of experience and other crafts. Hence, just as a doctor should be answerable to doctors, so others should also be answerable to their peers. A doctor, however, may be either an ordinary practitioner of the craft, an architectonic one, or thirdly, someone well educated in the craft (for there are people of this third sort in—one might almost say—all crafts). And we allow judgment to well-educated people no less than to those who know the craft.

It might seem, therefore, that election [of officials] is the same way. For choosing correctly is also a work of those who know the craft—for example, choosing a geometer is a work of geometers, and choosing a ship's captain of ship's captains. For even if, in the case of some works and crafts, certain private individuals also have a share in choosing, they do not have a greater share than those who know the craft. According to this argument, then, the multitude must not be put in control of the election or inspection of officials.

But presumably not all of these things are said correctly, both because of the argument just given, provided that the multitude is not too slavish (for each individually may be a worse judge than those who know the craft, but a better or no worse one when they all come together), and also because there are some crafts in which the maker might not be either the only or the best judge—the ones where those who lack the craft nonetheless know its products. For example, knowing about a house does not belong only to the maker—instead, the one who uses it is an even better judge (and the one who uses it is the household manager). A ship's captain too is a better judge of a rudder than a carpenter is, and a dinner guest, rather than the cook, a better judge of a feast. This puzzle, then, might seem to be adequately solved in this way.

There is another, however, connected with it. For it seems to be absurd for base people to control more important matters than decent ones do. But inspections and elections of officials are a most important thing. And in some constitutions, as was said, these are assigned to the people; for the assembly controls all such matters. And yet those who share in the assembly, in deliberation, and in judging are drawn from those with low property assessments (whatever their age), while the treasurers and generals and those who hold the most important offices are drawn from those with high property assessments.

But one can, then, also solve this puzzle in the same way. For presumably this way of doing things does seem to have something correct about it. For the official is neither the judge, nor the councilor, nor the assemblyman, but rather the court, the council, and the people, while each of the individuals mentioned (I mean the individual councilor, assemblyman, and judge) is only a part of these. So it is just for the majority to have control of the more important matters; for the people, the council, and the court consist of many individuals. Also, their collective property assessment is greater than the assessment of those who, whether individually or in small groups, hold the important offices. These matters, then, must be determined in this way.

1282b1 The first puzzle mentioned,[105] on the other hand, makes nothing else so evident as that the laws, when correctly laid down, should be in control, and that the ruler, whether one or many, should have control of only those matters on which the laws cannot pronounce with exactness, because it is not easy to make universal determinations concerning every case. But about what laws should be like if they are to be

105. 1281a35–39.

correctly laid down, nothing is yet clear. On the contrary, the puzzle stated previously[106] remains to be solved. For the laws must necessarily be base or excellent, just or unjust, at the same time and in the same way as the constitutions. Still, this at least is evident, that it is with a view to the constitution that the laws must be laid down. But if this is so, it is clear that laws that are in accord with correct constitutions must be just, and those in accord with deviant constitutions not just.

3.12
Justice, Equality, and Control

Since in every science and craft the end is a good, and the greatest and best good is the end of the one that has the most control of all, and this is the capacity of politics, and the just is the political good, and this is the common advantage, [one must, then, investigate what the just is]. It seems to everyone that the just is some sort of equality, and up to a point, at least, they agree with what has been determined in those philosophical accounts in which ethical matters were determined[107] (for justice is something to some people, and they say that it should be something equal to those who are equal). But what sort of equality and what sort of inequality—one should not overlook that. For it also involves a puzzle for political philosophy.

For perhaps someone might say that offices should be unequally distributed in accord with superiority in every good, provided people do not differ in their remaining qualities but happen to be similar, since for people who are superior something other [than an equal share] is just and in accord with worth. But if this is true, it will follow that those who excel in complexion, height, or any other good whatever should get more of what is distributed by political justice. And is this not obviously false? Manifestly, in the case of the other sciences and capacities, it is; for where pipe players are equally proficient in their craft, better pipes are not given to those who are more well-bred (for they will not play the pipe any better); rather, it is the one who is superior with respect to his work who is to be given the superior instruments. If what has been said is not yet clear, it will become still more evident if we take it further. For if someone is superior in pipe playing, but is very inferior in good breeding or beauty, then, even if each of these (I mean birth and beauty) is a greater good than pipe playing, and is proportionally more superior to pipe playing than he is superior in pipe playing, he must still be given the excellent pipes. For it is to the work of pipe playing that the superiority should contribute, and superiority in wealth and in good **1283^{a}1** breeding contribute nothing to it.

Further, according to this argument at any rate, every good would have to be comparable in contribution to every other. For if a certain height counted more in

106. 1281^{a}11–13.
107. *NE* 5.

competition, height in general would be in competition both with wealth and with freedom. So if this person is more superior to that one in height than that one is in virtue, and in general height is superior to virtue,[108] then all goods would be comparable. For if this much size is better than this much [virtue], it is clear that that much is equal to it. But, since this is impossible, it is clear that in the case of politics too it is reasonable not to dispute over political office in accord with every sort of inequality (for if some are slow runners and others fast, they should not have any more or any less a share of office because of this—but it is in athletic competitions that this sort of superiority wins honor). Rather, the sorts from which a city is composed are the ones in terms of which the dispute must be formulated. That is why it is reasonable for the well-bred, the free, and the rich to lay claim to the honor of office. For both those who are free and those who have assessed property are needed (for a city cannot consist entirely of poor people, any more than of slaves). But then if these things are needed in a city, it is clear that justice and political virtue are as well. For a city cannot be managed without these—except that without the former a city cannot exist, and without the latter it cannot be well managed.

3.13
The Just Basis for Control

With a view to the existence of a city, all or, at any rate, some of these qualities would seem to have a correct claim in the dispute. But with a view to good living, education and virtue would seem to have the most just claim of all in the dispute, as was also said previously.[109] But since those equal in one thing only should not have equality in everything, nor inequality either if they are unequal in only one thing, all constitutions of this sort are necessarily deviations.

It was said previously[110] that all dispute in a way justly, but that not all do so in an unconditionally just way. The rich have a claim because they own a larger share of the land, and the land is something communal, and further, because they are for the most part more trustworthy when it comes to treaties. The free and well-bred have a claim as being closely related to each other (for those who are more well-bred are more properly citizens than those who are ill-bred, and good breeding is esteemed at home by everyone). Further, they have a claim because the sons of better people are likely to be better, for good breeding is virtue of family. In the same way, then, we will say that virtue has a just claim in the dispute, for justice, we say, is a virtue relating to communities, which all the other virtues necessarily accompany. But then the majority also have a just claim against the minority, for in fact they are stronger, richer, and better, when taken as the majority in relation to the minority.

108. Reading πλεῖον ἀρετῆς μέγεθος ὅλως ὑπερέχειν.
109. 1281ᵃ1–8.
110. 1280ᵃ7–25.

If they were all to be present in a single city, therefore (I mean, for example, the good, the rich, the well-bred, and further, a political multitude distinct from them), **1283ᵇ1** will there be a dispute as to who should rule, or will there not? Within each of the constitutions mentioned, to be sure, the judgment as to who should rule is not disputed (for these differ from each other because of the ones who are in control—for 5 example, because in one the rich are in control, in another the excellent men, and each of the others differ the same way). Nonetheless, we are investigating how, when all these are present at the same time, the matter is to be determined. Suppose, then, that those who possessed virtue were altogether few in number—how should the 10 matter be settled? Should the fewness be investigated with a view to the work—to whether they are able to manage the city—or to whether there is a multitude of them large enough for there to be a city composed of them?

There is a certain puzzle that faces all who dispute over political office. For it could seem that those who claim that they deserve to rule because of their wealth have no 15 justice to their claim at all, and similarly those claiming to do so because of family; for it is clear that if someone were richer again than all the others, then, in accord with the same justice, this one person should rule all of them. Similarly, it is clear that someone who is superior when it comes to good breeding should rule those who dispute because of freedom. And the same thing will perhaps also occur in the case of 20 virtue in aristocracies; for if one single man were to be better than the others in the governing body, even though they are excellent men, then, in accord with the same justice, this man should be in control. If, then, the majority too should be in control because they are superior to the few, then, if one person or more than one—but fewer than the many—were superior to the others, these should be in control rather than 25 the majority.

All these considerations, then, seem to make it evident that none of the definitions in accord with which people claim that they themselves deserve to rule, while everyone else deserves to be ruled by them, is correct. And in fact even against those who claim that they deserve to have control of the governing body in accord with their virtue, and similarly against those who do so in accord with 30 wealth, majorities would have an argument of some justice; for nothing prevents a majority from being sometimes better and richer than the few, not as individuals but jointly.

That is why the puzzle that some people put forward and investigate can also be 35 dealt with in this way. For they raise a puzzle about whether a legislator who wishes to set up the most correct laws should legislate with a view to the advantage of the better citizens or that of the majority when the case just mentioned occurs. But what is correct must be taken to mean "in an equal way," and correct in an equal way is what holds with a view to the advantage of the whole city—that is, with a view to 40 the common advantage of the citizens. And a citizen commonly is someone who shares in ruling and in being ruled, and while in accord with each constitution he is someone different, in the best constitution he is the person who has the capacity, and **1284ᵃ1**

makes the deliberate choice, to rule and to be ruled with a view to the life that is in accord with virtue.

If, however, there is one person, or more than one (though not enough to fill up a city), who is so outstanding in extreme virtue that neither the virtue nor the political capacity of all the others is comparable to his (if there is only one) or theirs (if there are a number of them), then people of this sort can no longer be counted as a part of the city; for they would be treated unjustly if they were thought worthy of equal shares despite being so unequal in virtue and political capacity; for anyone of that sort would probably be like a god among human beings.

From this it is clear that legislation too must be concerned with those who are equals both in family and in capacity, and that for the other sort there is no law; for they themselves are law. For in fact anyone who attempted to legislate for them would be ridiculous. For they would presumably respond in the way Antisthenes tells us the lions did when the hares acted like popular leaders and demanded equality for everyone.

And that is why, due to the same cause, democratically governed cities introduce ostracism;[111] for of all cities these are held to pursue equality most, and so they used to ostracize those who seemed to be superior in power because of their wealth, their many friends, or any other sort of political strength, banishing them from the city for fixed periods of time. Also, the story goes that the Argonauts left Heracles behind due to this sort of cause; for the *Argo* refused to carry him along with the others because he greatly exceeded the other sailors. That is also why those who criticize tyranny and the advice of Periander to Thrasybulus must not be thought to be simply correct in their censure (for they say that Periander said nothing to the messenger who had been sent to him for advice, but rather leveled a field by taking away the ears of wheat that were superior in height, and when the messenger, who was ignorant of the cause of this, reported what happened, Thrasybulus understood that he was to do away with the superior men).

This practice is advantageous not only to tyrants, however, nor are tyrants the only ones who use it; instead, the same situation holds in the case of both oligarchies and democracies; for ostracism has the same capacity in its way as cutting the superior people down to size or sending them into exile. And the same thing is done with regard to cities and nations by those in control of power—for example, Athens with regard to the people of Samos, Chios, and Lesbos (for as soon as it had a firm grip on its rule, despite the agreements, it humbled them); and the king of the Persians often pruned back the Medes and Babylonians, as well as any others who had grown presumptuous because they had once ruled empires of their own.

1284b1

The problem is a universal one that concerns all constitutions, even the correct ones; for though the deviant constitutions, looking to the private good [of the rulers],

111. This form of banishment without loss of property or citizenship for ten (later five) years was introduced in Athens by Cleisthenes. See *Ath.* 22.1–8.

do what Periander advises, nonetheless those that look to the common good proceed in the same way. But this is also clear in the case of the various crafts and sciences; for no painter would allow the animal he was painting to have a foot that was out of proportion, not even if it were one of outstanding beauty, nor would a shipbuilder allow this in the case of the stern or any of the other parts of the ship, nor indeed would a chorus master allow someone to be a member of the chorus who had a louder and more beautiful voice than the entire chorus. And so, because of this, there is nothing to prevent monarchs from being in harmony with the city they rule when they do what Periander advises, provided that their own rule benefits their cities. That is why, as regards the generally agreed-upon sorts of superiority, there is a certain political justice to the argument in favor of ostracism.

It would be better, certainly, if the legislator from the start sets up the constitution so that it had no need for a remedy of this sort. But the next best path is to try to correct the constitution, should the need arise, with a corrective of this sort. This, though, is precisely what tended not to happen in cities; for people did not look to the advantage of their own constitutions, but used ostracisms in a factious way.

It is evident, then, that in each of the deviant constitutions ostracism is to the private advantage [of the rulers] and is just, but it is also evident, presumably, that it is not also unconditionally just. In the case of the best constitution, however, there is much puzzlement, not about superiority in other goods, such as power or wealth or having many friends, but about what must be done if there happens to be someone who is outstanding in virtue. For surely people would not say that someone of that sort should be expelled or banished—but then neither would they say that there should be rule over him; for that would be much the same as claiming that they deserved to rule over Zeus by dividing the offices. The remaining possibility, therefore, and it seems to be precisely the natural one, is for everyone to obey such a person gladly, so that those like him will be permanent kings in their cities.

3.14
Kinds of Kingship

It may perhaps be a good thing, after the arguments just discussed, to change to an investigation of kingship; for we say that it is one of the correct constitutions. But what must be investigated is whether it is advantageous for a city or territory that is going to be well managed to be under a kingship or not, but rather under some other constitution instead, or whether it is advantageous for some but not for others.

First, then, it must be determined whether there is one single kind of kingship or whether it exhibits differences. *This*, then, is easy to see, that it encompasses many **1285ª1** kinds, and that the mode of rule is not the same in all of them. For the one in the Spartan constitution, which seems to be most of all a kingship in accord with law, does not have control of everything, but it is only when the king leaves the territory

that he has leadership in military affairs. Further, matters relating to the gods are assigned to the kings.

This sort of kingship, then, is a sort of permanent autocratic generalship; for the king does not have control of life or death, except in a certain sort of kingship,[112] similar to that exercised in ancient times on military expeditions, by law of force. Homer makes this clear; for Agamemnon put up with being abused in the assemblies, but when they went out to fight he had control even over life or death; at any rate, he says:

> Anyone I find far from the battle . . .
> Will have no hope of escaping dogs and vultures,
> For I myself will put him to death.[113]

This, then, is one form of kingship, generalship for life. And of generalships for life some are in accord with family, while others are elective.

But there is another form of monarchy beyond this, such as kingships that exist among some barbarians. The powers all these have are much the same as those that tyrants have, but they are in accord with law and are hereditary. Because barbarians are by nature more slavish in their characters than Greeks, those in Asia being more so than those in Europe, they submit to rule of a master with no complaint. They are tyrannical, then, because of being of this sort. But they are stable because they are hereditary and in accord with law. And their bodyguards are kingly and not tyrannical due to the same cause. For it is the citizens who guard kings with their weapons, while a foreign contingent guards tyrants; for kings rule in accord with law and rule voluntary subjects, while the latter rule involuntary ones, so that the former have bodyguards drawn from the citizens, while the latter have bodyguards against the citizens.

These, then, are two forms of monarchy. But there is another, which is precisely the one that existed among the ancient Greeks, the ones they call "dictators." This, simply speaking, is an elected tyranny, which differs from barbarian kingship not by not being in accord with law but only by not being hereditary. Some holders of this office ruled for life, others for a defined period of time or for defined actions—for example, the Mytileneans once elected Pittacus to defend them against the exiles led by Antimenides and the poet Alcaeus. And Alcaeus makes it clear in one of his drinking songs that they did elect Pittacus tyrant; for he complains that "they set up baseborn Pittacus as tyrant of that gutless and ill-omened city, with great praise from the assembled throng."[114] These monarchies are and were tyrannical because of being like the rule of a master, but kingly because of being elective and over voluntary subjects.

112. Reading ἔν τινι βασιλείᾳ.
113. *Iliad* 2.391–393. The last line is not in our text of Homer.
114. Fr. 87 Diehl.

A fourth form of kingly monarchy, which existed in the heroic age, was over voluntary subjects, hereditary, and came about in accord with law. For because the first ones were benefactors of the multitude due to their knowledge of crafts or warfare, or because of bringing them together or providing them with land, they became kings over voluntary subjects, and their descendants inherited the office from them. They were in control of leadership in war and of those religious sacrifices which were not in the hands of priests. They also judged legal cases. Some of them did so under oath, and others not—the oath consisted in lifting up the scepter. In ancient times they ruled continuously over the affairs both of the city and of its territory and over foreign affairs. But later, when the kings themselves relinquished some of these things, and others were taken away by the mob, in various cities only the sacrifices were left to the kings, and even where there was a kingship still worthy of the name, they held leadership only in military affairs conducted beyond the frontiers.

There are, then, these forms of kingship, four in number. One belongs to the heroic age—this one was over voluntary subjects but for certain defined purposes, the king being general, judge, and in control of matters to do with the gods. The second is the barbarian—this is rule of a master, on the basis of family, in accord with law. The third is so-called dictatorship—which is elective tyranny. And fourth among them is Spartan kingship—this, simply speaking, is permanent generalship in accord with family. These, then, differ from each other in this way.

But there is a fifth form of kingship, when one person controls all matters, just as each nation and each city controls common matters. It is ordered on the model of household management. For just as household management is a sort of kingship of a household, so this kingship is household management of a city or a nation or several nations.

3.15
Kingship and Law

It is pretty much the case, then, that there are (one might almost say) just two forms of kingship that must be investigated, the last one and the Spartan; for most of the others lie in between these; for they control less than absolute kingship but more than Spartan kingship. So our investigation is pretty much about two questions: first, whether it is advantageous for cities to have a permanent general (whether chosen in accord with family or by turns), or not advantageous; second, whether it is advantageous for one person to control everything, or not advantageous. However, the **1286^{a}1** investigation of this sort of generalship looks to be of a form that belongs more to an investigation of laws than of constitutions (for it can come to exist in any constitution). So the first question may be set aside. But the remaining mode of kingship is a form of constitution. So one should get a theoretical grasp on it and go through the puzzles it involves.

The starting-point of the investigation is this, whether it is more advantageous to be ruled by the best man or by the best laws. Those who think it advantageous to be ruled by a king hold that laws speak only of the universal, and do not prescribe with a view to particular circumstances, so that it is foolish to rule in any craft in accord with what is written down. And so it is a good thing that in Egypt the doctors are allowed to change the treatment [prescribed by the manuals] after the fourth day—although, if they do so earlier, it is at their own risk. It is evident, therefore, that the best constitution is not one that is in accord with what is written down and laws, due to the same cause. But then, the rulers should possess the universal account as well. And something to which the element of feeling is wholly unattached is better than something in which it is innate. This element does not belong to the law, while every human soul necessarily possesses it. But presumably it should be said, to balance this, that a human being will deliberate better about particular cases. That it is, therefore, necessary for [the ruler] to be a legislator is clear, and for laws to be laid down, but for them not to be in control insofar as they deviate from what is best, although they should certainly be in control everywhere else.

As regards cases that the law cannot judge either at all or well, though, should the one best person rule, or everyone? For even as things stand, people come together to hear cases, deliberate, and judge, and the judgments themselves all concern particulars. Taken individually, any one of these people is presumably inferior [to the best person]. But a city consists of many people, just like a feast to which many contribute is better than one that is one and simple. That is why a mob can also judge many things better than any random individual.

Further, a large quantity is more incorruptible, like a larger quantity of water, and so the multitude are more incorruptible than the few. And while the judgment of an individual is necessarily corrupted when he is overcome by anger or some other passion of this sort, in the same situation it takes work to get all the citizens to become angry and make mistakes at the same time.

Suppose the multitude in question consists of the free, however, and that it does nothing outside the law, except as regards matters the law cannot cover. Granted, this is not an easy thing to arrange where numbers are large. But suppose there were a number who were both good men and good citizens: which would be more incorruptible, one ruler or a larger number all of whom were good? Isn't it clear that it would be the latter? "But such a group will split into factions, while the single person is free of factional conflict." One should, perhaps, oppose this objection by pointing out that they may be excellent in soul just like the single individual.

If, then, the rule of a number of people, all of whom are good men, is to be counted as an aristocracy, and the rule of one person as a kingship, aristocracy would be more choiceworthy for cities than kingship, both when the office involves capacity and when it is separate from capacity, provided that it is possible to find a number of people of similar quality. This is presumably also why people were formerly under

kingships, because it was rare to find men who were very superior in virtue, especially as the cities they lived in at that time were small.

Further, they made men kings as a consequence of benefits conferred, and conferring benefits is precisely what it is the work of good men to do [and good men were rare]. When, however, there began to be many people who were similar in virtue, they no longer put up with kingship, but looked for something common and put in place a [non-monarchical] constitution. But they grew worse when they began to acquire wealth from the communal funds, and it was from this, one might reasonably suppose, that oligarchies arose; for they made wealth an honored thing. Then from oligarchies they changed first into tyrannies, and from tyrannies to democracy; for by concentrating power into ever fewer hands because of a shameful desire for profit, they made the multitude stronger, with the result that it revolted and democracies arose. Now that cities have become even larger, it is presumably no longer easy for any other constitution to arise besides democracy.

If one does posit kingship as the best thing for a city, how is one to handle the matter of children? Is the family as such to rule as kings? But if they turn out as some have done, it would be harmful. "But in that case, even though he is in control, he will not give it to his children." But this is no longer easy to believe; for it would be a hard thing to do, and would demand greater virtue than is in accord with human nature.

There is also a puzzle about the king's power, as to whether anyone who is going to rule as king should have some force in attendance with which he can force anyone who does not wish to obey his rule. If not, how can he possibly manage his office? For even if he exercised control in accord with the law, and never acted in accord with his own wishes contrary to the law, nonetheless it would be necessary for him to have some power with which to guard the laws. In the case of this sort of king it is perhaps not difficult to determine the solution; for he should have a force, but a force so great as to be stronger than an individual, whether by himself or together with many, but weaker than the multitude. This is the way the ancients gave bodyguards when they appointed someone from the city to be what they called a "dictator" or "tyrant," and when Dionysius asked for bodyguards, someone advised the Syracusans to give him bodyguards of this sort.

3.16
Absolute Kingship

The account has now arrived at the king who does everything in accord with his own wish, and it is he that must be investigated. For the king, so-called, who rules **1287ᵃ1** in accord with law, is not, as we said,[115] a form of constitution (for a permanent

115. 1286ᵃ2–4.

generalship can exist in all of them, for example, in a democracy and an aristocracy, and many put one person in control of managing affairs—there is an office of this sort in Epidamnus, indeed, and to a lesser extent in Opus as well).

But as regards so-called absolute kingship (which is where the king rules everything in accord with his own wish), it seems to some people that it is not even natural for one person from among all the citizens to be in control, when the city consists of similar people; for, in accord with nature, justice and worth must be the same for those who are similar by nature. So if indeed it is harmful to their bodies for unequal people to have equal nourishment or clothing, the same also holds in the case of honors, and similarly, therefore, when equal people have inequality. That is why it is just for them to rule no more than they are ruled, and, therefore, to do so in turn. But this already involves law; for the order is law.

It is more choiceworthy, therefore, to have law rule than any one of the citizens. And, by this same argument, even if to have certain people rule is better, they must be appointed as guardians of the laws and assistants to them; for it is necessary for there to be some offices, although it is not just, they say, for there to be only one—at any rate, not when all are similar.

As for the things that the law seems unable to determine, they could not be known by a human being either. Rather, the law, having designedly educated the rulers for these eventualities, hands over the rest to be judged and managed by the ruler in accord with their most just consideration. Further, it allows itself to be rectified in any way that seems, on being put to the test, to be better than the existing laws.

The one who bids the law to rule, then, would seem to be bidding the god and the understanding alone to rule, while the one who bids a human being to do so adds on a wild beast as well; for appetite is a thing of that sort, and spirit distorts [the judgment of] rulers even when they are the best men. That is why law is understanding without desire.

And the comparison with the crafts, that it is bad to give medical treatment in accord with what is written down and more choiceworthy to rely on those who possess craft knowledge instead, would seem to invoke a false paradigm. For doctors never do anything contrary to [medical] reason because of friendship, but earn their pay by healing the sick. Those who hold political office, on the other hand, are accustomed to doing many things out of spite or gratitude. In fact, if people suspected their doctors of being persuaded by their enemies to do away with them because of a bribe, they would seek treatment derived from what is written down instead. Moreover, doctors themselves call in other doctors to treat them when they are sick, and
1287b1 coaches call in other coaches when they are exercising, on the supposition that they are unable to judge truly because they are judging about their own cases and under the influence of feelings. So it is clear that in seeking what is just they are seeking the mean; for the law is the mean.

Further, laws that are in accord with habits have more control and deal with things that have more control than do written laws, so that even if a human ruler is safer than written laws, he is not safer than those that are in accord with habit.

Moreover, it is certainly not easy for a single ruler to oversee many things. Therefore, there will need to be numerous officials appointed under him. So what difference is there between having them there right from the start and having one person appoint them in this way? Further, as was also said previously,[116] if it is indeed just for the excellent man to rule because he is better, well, two good ones are, at any rate, better than one. Hence the saying "When two go together . . . ," and Agamemnon's prayer, "May ten such counselors be mine."[117]

Even as things stand, however, the judgment of officials, such as judges, has control of some matters, those that the law cannot determine, since about those matters that it can determine, no one disputes that the law itself would rule and judge best. But since some matters can be covered by the laws, while others cannot, the latter cause people to raise and investigate the puzzle as to whether it is more choiceworthy for the best law to rule or the best man; for to legislate about matters that call for deliberation is impossible. The counterargument, therefore, is not that it is not necessary for a human being to judge matters of this sort, but that there should be not only one judge, but rather many.

For each official judges well if he has been well educated by the law. And it would presumably seem strange if someone, when judging with one pair of eyes, one pair of ears, and doing actions with one pair of feet and hands, could see better than many people with many pairs; for, even as things stand, monarchs provide themselves with many eyes, ears, hands, and feet; for they make into co-rulers those who are friendly to their rule and to themselves. If they are not friendly in this way, they will not do things in accord with the monarch's deliberate choice. But if they are friends of his and of his rule—well, a friend is someone equal and similar, so if he thinks they should rule, he must likewise think that those who are equal and similar to him should rule.

The arguments of those who dispute against kingship, then, are pretty much these.

3.17
Constitutions Suited to Different Peoples

But presumably these arguments hold in the case of some people, but do not hold in the case of others. For what is by nature both just and advantageous is one thing in the case of rule by a master, another in the case of kingship, and another in the case of rule by a politician. In the case of tyrannical rule, however, or of the other constitutions that are deviations, nothing is just or naturally advantageous; for they come about contrary to nature. But from what has been said, it is evident, at any rate, that in a case where people are similar and equal, it is neither advantageous nor just **1288ᵃ1**

116. 1286ᵇ3–5.
117. Homer, *Iliad* 2.372, 10.224.

for one person to be in control of all, regardless of whether there are no laws, and the king himself is law, or whether there are laws, or whether he and the laws are good, or he and the laws are not good, or even—except in a certain way—whether he is their superior in virtue. What that way is must now be stated—although it has in a way already been stated too.[118]

First, it must be determined what is suited to kingship, what to aristocracy, and what to polity. Suited to kingship, then, is a multitude of the sort that naturally yields a stock that is superior in the virtue appropriate to political leadership. Suited to aristocracy is a multitude that naturally yields a multitude[119] capable of being ruled, with the rule appropriate to free people, by those who are suited to leadership by their possession of the virtue required for the rule of a politician. And suited to polity is a multitude in which there naturally arises a multitude useful for war,[120] which is capable of ruling and being ruled, under a law that distributes the offices to the rich in accord with worth.

Whenever there happens to arise, then, either a whole family, or even some one individual from among the others, who is so superior that his virtue exceeds that of all the others, then it is just for this family to have the kingship and to control everything, and for this one individual to be king. For, as was said previously, this is not only in accord with the justice usually put forward by those who put in place polities, aristocracies, oligarchies, or again democracies (for they all claim to be worthy of rule in accord with superiority in something, though not superiority in the same sort of thing), but also in accord with what was said previously.[121] For it is surely not appropriate to kill or exile or ostracize an individual of this sort, nor to claim that he deserves to be ruled in turn; for it is not natural for the part to exceed the whole, but this is what has happened to the one who is at this extreme. So the only remaining option is to obey such a person and for him to have control not by turns but unconditionally.

Kingship, then, and its differences, and whether it is advantageous for cities or not, and if so, for which and in what way, may be determined in this way.

3.18
The Best Constitution

We say that there are three correct constitutions, and that of these the best must be the one managed by the best people. This is the sort of constitution in which there happens to be either one particular person or a whole family or a multitude that is superior in virtue to all the rest, and where the latter are capable of being ruled and

118. 1284[a]3–[b]35.
119. Reading πλῆθος.
120. Reading πλῆθος πολεμικὸν.
121. 1284[a]3–[b]34.

the former of ruling with a view to the most choiceworthy way of living. And in our first accounts[122] it was proved that the virtue of a man must be identical to that of a citizen of the best city. Hence it is evident that in the same way, and through the same things, as a man becomes excellent, one might set up a city that is ruled by an aristocracy or by a king, so that the education and habits that make a man excellent are pretty much the same as those that make him a political or kingly ruler. **1288^b1**

Since these matters have been determined, we must attempt to discuss the best constitution, the way it naturally arises and how it is put in place. {It is necessary, then, for anyone who is going [to do this] to make the appropriate investigation . . .}[123]

BOOK 4[124]

4.1
The Science of Politics

Among all the crafts and sciences that are not partly developed but that, having become complete, deal with some one kind, it belongs to a single one to get a theoretical grasp on what is fitting in the case of each kind. For example, what sort of training is fitting for what sort of body, what sort is best (for the best is necessarily fitting for the sort of body that is by nature most noble and most nobly equipped), and what one sort is fitting for most bodies (for this too is a work of athletic training). Further, if someone has an appetite neither for the [physical] state nor for the scientific knowledge appropriate for those involved in competition, it belongs no less to coaches and athletic trainers to provide this capacity too. And we see something similar occurring with regard to medicine, shipbuilding, clothing manufacture, and every other craft.

So it is clear that it belongs to the same science to get a theoretical grasp on what the best constitution is and what it would have to be like to be most of all in accord with our prayers, provided that no external impediments stand in its way.

Also, which constitution is fitting for which cities; for achieving the best constitution is presumably impossible for many of them, and so neither the unconditionally best constitution nor the one that is best in the underlying conditions should be neglected by the good legislator and true politician.

122. 3.4–5.

123. This incomplete sentence appears in a slightly different form as part of the opening sentence of Book 7.

124. The end of 3.18 prepares us for a discussion of the best constitution. Moreover, the opening of 4.2 suggests that such a discussion has already taken place, while Aristotle's own best constitution is not formally discussed until Books 7–8. For this reason some editors place these immediately following Book 3.

Further, the constitution based on a hypothesis; for it must be able to study how any given constitution might come into existence from the start, and in what way, once in existence, it might be preserved for the longest time. I mean, for example, when some city happens to be governed neither by the best constitution (not even having the necessary resources for it) nor by the best one possible in the existing circumstances, but by a worse one.

Besides all these things, the science should know which constitution is most fitting for all cities. And so most of those who have expressed views about constitutions, even if what they say is correct in other respects, certainly fail to give useful advice. For one should not get a theoretical grasp only on the best constitution, but also on the one that is possible, and similarly on the one that is easier and more attainable for all cities.

As things stand, however, some inquire only about the constitution that is highest and requires a lot of resources, while others, though they discuss a more commonly attainable constitution, do away with the actually existing constitutions and praise the Spartan or some other. But what must be done is to describe the sort of order that people will be easily persuaded to accept and be able to set in motion,[125] given what they already have, as it is no less work to reform a constitution than to establish one from the start, just as[126] it is no less work to unlearn something than to learn it at the start.

That is why, in addition to what has just been mentioned, a politician should also be able to help existing constitutions, as was also said previously.[127] But this is impossible if he does not know how many forms of constitutions there are. As things stand, however, some people think that there is just one sort of democracy and one of oligarchy. But this is not true. So one must not overlook the differences in each of the constitutions, how many they are and in how many ways they can be combined.

And it is [the work] of this same practical wisdom to see both which laws are best and which are fitting for each of the constitutions. For laws should be set up, and all do set them up, by looking to the constitutions and not the constitutions by looking to the laws. For a constitution is for cities the order of their offices, how they are distributed, what element is in control in the constitution, and what the end of each community is. But the separate laws, which are among the things that make clear what the constitution is, are those that the officials must rule by and guard against those who transgress. And so it is clear that a knowledge of the differences in each constitution and of their number[128] is also necessary for setting up laws; for the same laws cannot be advantageous to all oligarchies nor to all democracies—if indeed there are several sorts of them, and not only one sort of democracy or of oligarchy.

125. Reading κινεῖν.
126. Reading ὡς.
127. 1288b27–33.
128. Reading τὸν ἀριθμὸν.

4.2
Deviant Constitutions and the Tasks of Book 4

In the initial methodical inquiry concerning constitutions, we distinguished[129] three correct ones (kingship, aristocracy, polity) and three deviations from them (tyranny from kingship, oligarchy from aristocracy, and democracy from polity). Aristocracy and kingship were also spoken about (for getting a theoretical grasp on the best constitution is the same as discussing these names; for each of them wishes to be set up in accord with virtue furnished with resources). Further, how aristocracy and kingship differ from each other, and when a constitution should be considered a kingship, was determined previously.[130] It remains to deal with the constitution that is called by the name shared in common by all constitutions,[131] and also with the others—oligarchy, democracy, and tyranny.

It is also evident which of these deviations is worst and which second worst. For the deviation from the first and most divine constitution must of necessity be the worst. But the kingship must either be in name only and not in fact or it must be due to the great superiority of the person ruling as king. So tyranny, because it is **1289b1** the worst, is furthest removed from being a constitution, oligarchy is second worst (for aristocracy is very far removed from this constitution), and democracy the most moderate.

An earlier thinker[132] has already expressed this same view, though he did not look to the same thing as us. For he judged that when all these constitutions are decent (for example, when an oligarchy is good, and also the others), democracy is the worst of them, but that when they are bad, it is the best. But we say that these constitutions are wholly in error, and that it is not correct to speak of one sort of oligarchy as better than another, but as less bad.

But making a judgment about this sort of issue may be set aside for the present. Instead, we must determine: First, how many differences there are in constitutions—if indeed there are several forms of democracy and oligarchy.

Next, which constitution is most attainable, and which most choiceworthy after the best constitution.

And if there is some other constitution that is ruled in the best way and is correctly composed, and at the same time fitting for most cities, what it is.

Next, which of the other constitutions is more choiceworthy for which people (for maybe democracy is more necessary than oligarchy for some, while for others the reverse holds).

129. 3.7.
130. 3.7, 3.17.
131. I.e., "polity (*politeia*)."
132. Plato, *Statesman* 302e–303b.

After these things, we must determine in what way someone who wishes to do so should put in place these constitutions—I mean, each form of democracy and again of oligarchy.

Finally, when we have gone as far as we can to give a concise account of each of these issues, we must attempt to go through the ways in which constitutions are destroyed and those in which they are preserved, both in general and in the case of each one separately, and through what causes these most naturally come about.

4.3
Why There Are Several Constitutions

The cause of there being several constitutions is that in every city the number of the parts is greater than one. For, in the first place, we see that all cities are composed of households, and next again that within this multitude there have to be some people who are rich, some who are poor, and some who are in the middle, and that of the rich and of the poor, the first lot possess hoplite weapons, while the second lot are without hoplite weapons. We also see that the people are part farming, part trading, and part unrefined. And among the notables there are differences both in their wealth and in the extent of their property—for example, in the breeding of horses (for this is not easy for those without wealth to do; that is why, indeed, there were oligarchies among those cities in ancient times whose power lay in their cavalry, and who used horses in wars with their neighbors—for example, the Eretrians, the Chalcidians, the Magnesians on the river Maeander, and many of the others in Asia). Further, in addition to differences in accord with wealth, there are differences in accord with breeding, in accord with virtue, and in accord with everything else of the sort that was
1290a1 said to be part of a city in our discussion of aristocracy;[133] for there we distinguished the number of parts that are necessary to any city; for sometimes all of these parts share in the constitution, sometimes fewer, sometimes more.

It is evident, therefore, that there must be several constitutions that differ in form from each other; for their parts themselves also differ in form. For a constitution in fact is an ordering of the offices, and all constitutions distribute these either in accord with the capacity of the participants, or in accord with some sort of equality common to them (I mean, for example, the capacity of the poor, or that of the rich, or some equality common to both). There must, therefore, be as many constitutions as there are orders that are in accord with the sorts of superiority and the differences of the parts.

But there seem to be two in particular, since just as in the case of the winds some are said to be northern, others southern, and the others deviations from these, so there seem to be two constitutions, democracy and oligarchy. For aristocracy is

133. Probably a reference to 1283a14–26, although the issue is also discussed in 7.7–9.

regarded as a sort of oligarchy, on the supposition that it is a sort of rule by the few, while a so-called polity is regarded as a sort of democracy, just as the west wind is regarded as northerly, and the east as southerly.[134] And something similar holds in the case of harmonies, so some people say; for there as well two forms are posited, the Dorian and the Phrygian, and the other modes are called either "Doric" or "Phrygic."

People are particularly accustomed, then, to think of constitutions in this way. But it is truer and better to distinguish them as we have, and say that two constitutions (or one) are correctly composed, and that the others are deviations from them, some from the well-mixed "harmony," and others from the best constitution, the more tightly controlled ones and those that are more like the rule of a master being more oligarchic, and the unrestrained and soft ones, democratic.

4.4
Democracy and Oligarchy

One should not regard democracy, in the way some people[135] are accustomed to do now, as simply being where the majority is in control (for both in oligarchies and everywhere else, the larger part is in control), nor an oligarchy as where the few control the constitution. For if the inhabitants totaled thirteen hundred, and a thousand were rich and gave no share in the honors of office to the three hundred poor, although these were free people and equal to the rich in all other respects, no one would say that they were democratically governed. Similarly, if the poor were few, but stronger than the rich, who were a majority, no one would call a constitution of this sort an "oligarchy" if the others, though rich, did not share in the offices. Therefore, one must rather say that a democracy is when the free are in control, and an oligarchy when the rich are in control. But it happens that the former are many **$1290^{b}1$** and the latter few; for many are free but few are rich. For otherwise there would be an oligarchy even if offices were distributed in accord with height (as is said to happen in Ethiopia) or in accord with noble stature; for people of noble stature and tall people are both few in number.

Yet it is not enough to define these constitutions by these things alone. Rather, since the parts both of democracy and of oligarchy are several, it must be grasped further that it is not a democracy if a few free people rule over a majority who are not free, as, for example, in Apollonia on the Ionian Gulf and in Thera (for in each of these cities the offices were held by those who were outstanding for their good breeding and had first taken possession of the colonies, although they were few among many), and that it is not a democracy[136] either if the rich rule because they are a majority, as was formerly the case in Colophon, where the majority possessed large

134. *Mete*. $364^{a}18–27$.
135. Plato, *Statesman* 291d.
136. Reading δῆμος.

properties before the war against the Lydians occurred.[137] Rather, it is a democracy when the free and poor, who are a majority, have the control of office, and an oligarchy when the rich and wellborn, who are few, do.

It has been stated, then, that there are several constitutions, and what the cause of this is. But let us now say why there are more than the ones mentioned, which ones they are, and due to what cause, taking as our starting-point what was stated previously.[138] For we agreed that no city has only one part but several.

If we wanted to grasp the forms of animal, we would first determine what precisely it is that every animal must have—for example, some of the perceptual organs, something capable of working on and absorbing nourishment, such as a mouth and a stomach, and in addition to these, parts by which each of them moves. If, then, there were only this many parts, but there were differences in them (I mean, for example, if there were several kinds of mouths, stomachs, and perceptual organs, and further, parts for movement too), then the number of ways of combining these will necessarily produce several kinds of animals (for the same animal cannot have many different sorts of mouth, nor of ears either). So, when all the possible ways of coupling them have been grasped, they will produce forms of animal, and as many forms of animal as there are combinations of the necessary parts. It is the same way with the constitutions mentioned. For cities in fact are composed not of one but of many parts, as has often been said.[139]

One of these parts is the multitude concerned with nourishment, the ones called "farmers." A second is the one called "unrefined." This is the one concerned with the crafts a city cannot be managed without—and of these, some are present of necessity, while others contribute to luxury or noble living. A third is the trading part (by which I mean the one concerned with selling and buying, retail trade and commerce). A fourth is that of hired laborers. A fifth is the kind that goes to war for the city, which is no less necessary than the others, if the inhabitants are not to become the slaves of any aggressor. For presumably it is impossible for any city that is by nature slavish to deserve to be called a "city"; for a city is self-sufficient, while a slavish thing is not self-sufficient.

That is why what is said in the *Republic*,[140] though sophisticated, is not adequate. For Socrates says that a city is composed of four most necessary parts, and these, he says, are a weaver, a farmer, a shoemaker, and a builder. Then, on the supposition that these are not self-sufficient, he adds a blacksmith, people to look after the necessary livestock, and further, both someone engaged in retail trade and someone engaged in commerce. All these become the full complement of his first city—as if every city were composed for the sake of providing the necessities, not rather for the sake of what is noble, and had equal need of both shoemakers and farmers. Nor does he

137. In the reign of Gyges in the first half of the 7th cent BC.
138. 1289b27.
139. 1274b38–40, 1283a14–17, 1289b27–28, 1290b23–24.
140. 369d–371e.

assign it a part that goes to war for the city until, its territory being expanded and encroaching on that of their neighbors, they become involved in war.

Yet even in these communities of four (or however many) parts, there must be the one making assignments and rendering judgment about what is just. So, if indeed one should regard soul as more a part of an animal than body, then, in the case of cities too, things of the following sort are to be counted as parts rather than those directed to the satisfaction of necessary needs: the part concerned with war, the part that participates in administering judicial justice, and in addition to these the part that deliberates, deliberation being precisely a work of political comprehension. (It makes no difference to the argument whether these works belong to separate people or the same ones; for in fact it often happens that the same people both serve as hoplites and do the farming. So, if indeed both the former and the latter are to be regarded as parts of the city, it is certainly evident that the hoplite element must be a part of the city.)

Seventh is the part that performs public service by means of its property, the one we call "the rich."

Eighth is the part that renders public service, that is, holds the various offices, if indeed without officials a city cannot exist. There must, then, be some people who are able to rule and render public service for the city either continuously or in turn.

There remains the one we happened to distinguish just now, the part that deliberates and renders judgment about the claims of people involved in disputes. If indeed these things must take place in cities, then, and do so in a way that is noble and just, there must also be some people who share in the virtue of politicians.[141] **1291b1**

As for the other capacities, many hold that they can belong to the same people—for example, that it is possible for the same people to be the ones who go to war for the city and to be farmers and craftsmen, and to be both deliberators and judges besides. And everyone claims to possess the relevant virtue too, and thinks he is capable of ruling in most of the offices. But for the same people to be both rich and poor is impossible. That is why these in particular, the rich and the poor, seem to be parts of a city. Further, because the former are for the most part few in number and the latter many, it appears that of the parts of a city these two are contraries. So constitutions are put in place in accord with the sorts of superiority belonging to these, and there seem to be two constitutions, democracy and oligarchy.

That there are a number of constitutions, and what the causes of this are, was stated previously.[142] But that there are also several forms of democracy and of oligarchy, we say. This is in fact evident from what has been said. For there are several forms both of the people and of the so-called notables. For example, of the people, one form is the farmers and another that concerned with the crafts, another is the part involved in trade, which is engaged in buying and selling, another the part concerned with

141. Reading πολιτικῶν.
142. 1289b27–28.

the sea—of which part is navy, part is engaged in the craft of wealth acquisition, part in ferrying passengers, and part in fishing. (For in many places a particular one of these amounts to a large mob of people—for example, fishermen in Tarentum and Byzantium, navy men in Athens, traders in Aegina and Chios, and ferrymen in Tenedos.) In addition to these, there is the part involved in manual labor and that has little property, so that it is not able to be at leisure. Further, the part consisting of those who are free but not of citizen parentage on both sides, and whatever other similar form of multitude there may be. Among the notables, there are ones distinguished by wealth, good breeding, virtue, education, and the other characteristics that are said [of things] in accord with the same sort of difference as these.

The first sort of democracy, then, is the one that is said to be above all in accord with equality. For the law in a democracy of this sort says that there is equality when the poor enjoy no more superiority than the rich, and when neither is in control but both are similar. For if indeed freedom exists above all in a democracy, as some people suppose,[143] and equality too, then this would be particularly the case when everyone shares, as much as possible, in the constitution in a similar way. But since the people are a majority, and the belief of the majority is in control, this constitution must be a democracy. This, then, is one form of democracy.

Another is where offices are filled on the basis of property assessments, but these are low, and where anyone who acquires the assessed amount may share [in the constitution], while anyone who loses it may not.

1292a1 Another form of democracy is where all the uncontested citizens share, and the law rules.

Another form of democracy is where everyone shares in office merely by being a citizen, and the law rules.

Another form of democracy is the same in other respects, but the multitude has control, not the law. This arises when decrees are in control instead of laws; and this happens because of popular leaders. For in cities under democracies that are in accord with law, popular leaders do not arise, but rather it is the best of the citizens who take the front seats. Where the laws are not in control, however, there popular leaders arise. For the people become a monarch, one monarch composed of many people; for the many are in control not as individuals but all together.

When Homer says "to have many rulers is not good,"[144] it is not clear whether he means this sort of rule, or the sort where there are a number of individual rulers. In any case, a people of this sort, because it is a monarchy, seeks to exercise monarchic rule, because of not being ruled by the law, and becomes a master. As a result flatterers are held in esteem and a democracy of this sort is the analog of tyranny among the monarchies. That is why indeed their characters are the same, in that both act like masters toward the better people, the decrees of the one are like the edicts of the

143. Plato, *Republic* 557a–c, 562b–563d.
144. *Iliad* 2.204.

other, and a popular leader and a flatterer are the same or analogous. And each of these exercises great power with each, flatterers with tyrants, popular leaders with peoples of this sort. And it is these popular leaders who, by bringing everything before the people, are responsible for decrees being in control rather than the laws; for they become great because the people are in control of everything, and also because they are in control of the belief of the people; for the majority are persuaded by them. Further, those who make accusations against officials say that the people should judge. The suggestion is gladly accepted by the people, with the result that all the offices are destroyed.

But it might seem reasonable to object that this sort of democracy is not a constitution at all, on the grounds that where the laws do not rule there is no constitution. For the law should rule everything,[145] while in the case of particulars the officials and the constitution should render judgment.[146] So if indeed democracy is one of the constitutions, it is evident that this state of affairs, in which everything is managed by decree, is not even a democracy in the strict sense; for no decree can possibly be universal.

The forms of democracy, then, should be distinguished in this way.

4.5
Forms of Oligarchy

Among the various forms of oligarchy, one is where offices are filled on the basis of such a high property assessment that the poor do not share in the constitution, even though they are a majority, but where anyone who does acquire the assessed amount may share in it.

Another is where the offices are filled on the basis of a large assessment, and the officials themselves elect those who will fill any vacancy. If they elect from among all of these, it seems more aristocratic, if from some specified group, oligarchic.

Another form of oligarchy is where a son succeeds his father.

A fourth is where what was just mentioned occurs, and not the law but the officials rule. This is the counterpart among the oligarchies of tyranny among the monarchies, and of the democracy we spoke of last among the democracies; and an oligarchy of this sort they call a "dynasty."

There are, then, these many forms of oligarchy and democracy. But one must not overlook the fact that in many places it has happened that though the constitution that is in accord with the law is not democratic, because of custom and direction they are governed democratically. Similarly, it is the reverse in other places—the constitution that is in accord with the laws is more democratic but, because of custom

145. Rejecting the addition of τῶν καθόλου.
146. Reading τὴν πολιτείαν κρίνειν.

and direction, they are governed in a more oligarchic way. This happens especially after there have been constitutional changes; for the change is not immediate, but they are content at first to get more than the others in small ways. So the laws that existed before remain in effect, but it is those who have changed the constitution who exercise the power.

4.6
Forms of Democracy and Oligarchy

It is evident from what has been said that there are this many forms of democracy and oligarchy. For either all of the mentioned parts of the people must share in the constitution, or some must and others not

When, then, the part that farms and that owns a moderate amount of property has control of the constitution, it is governed in accord with laws (for they have enough to live on as long as they keep working, but they cannot afford to be at leisure, so they put the law in charge and hold only such assemblies as are necessary). As for the other part, it is open to them to share when they have acquired the property assessment defined by the laws. That is why it is open to all those who have acquired it to share; for, generally speaking, it is oligarchic when it is not open for all to share—but, then, for it to be open to them to be at leisure is impossible in the absence of revenues.[147] This, then, is one form of democracy and these are the causes of it.

Another form arises because of the following distinction; for it may be possible for everyone of uncontested family descent to share, but for only those who have the leisure to actually do so. That is why, indeed, in this sort of democracy the laws rule, because there is no revenue.

A third form is when all who are free may share in the constitution, but, due to the cause just mentioned, they do not share, so that the law necessarily rules in this sort too.

1293a1 A fourth form of democracy was the last to arise in cities. For because of cities having become much larger than the original ones and having abundant sources of revenue, everyone shares in the constitution, because of the superiority of the multitude. And all do share and govern, because even the poor are able to be at leisure, since they get paid. A multitude of this sort is especially at leisure; for care of their own property does not impede them at all. But it does impede the rich, so that they often do not take part in the assembly or serve on juries. That is why the constitution comes to be controlled by the multitude of poor citizens, instead of by the laws.

The forms of democracy, then, are such and so many because of these necessities. And here are those of oligarchy:

147. Reading τὸ . . . οὐσῶν.

When a larger number of people own property, though not an excessive amount, this is the first form of oligarchy; for anyone who acquires the amount may share, and because of the multitude of people sharing in the governing body, law is necessarily in control, not human beings; for the more removed they are from monarchy, having neither so much property that they can be at leisure without worrying nor so little that they need to be supported by the city, the more they necessarily think that the law deserves to rule them, not themselves.

But if those who own property are fewer and their properties greater than those mentioned before, the second sort of oligarchy arises; for, being stronger, they claim that they deserve to get more. That is why they themselves elect from among the rest of the citizens those who are to enter the governing body. But as they are not yet strong enough to rule without law, they pass a law to this effect.

But if they tighten it by becoming fewer and owning larger properties, the third stage of oligarchy is reached, where they keep the offices in their own hands, but do so in accord with a law requiring deceased members to be succeeded by their sons.

But when they now tighten it excessively by their property holdings and the number of their friends, a dynasty of this sort comes close to being a monarchy, and human beings are in control, not the law. This is the fourth form of oligarchy, a counterpart of the final one of democracy.

4.7
Forms of Aristocracy

There are also two constitutions besides democracy and oligarchy, one of which is mentioned by everyone and is said to be one of the four forms of constitutions. The four they mention are monarchy, oligarchy, democracy, and, fourth, so-called aristocracy. There is a fifth, however, which is referred to by the name shared by all constitutions, the one called *politeia* ("polity"). But because it does not occur often, it gets overlooked by those who try to enumerate the forms of constitutions, and, like Plato,[148] list only the four in their discussion of constitutions. **1293b1**

It is correct, then, to call the constitution we went through in our first accounts[149] an "aristocracy" (for the one consisting of those who are unconditionally best in accord with virtue, and not those who are good men relative to a hypothesis, is the only constitution that it is just to call an "aristocracy"; for only in it is the same person unconditionally a good man and a good citizen, while those who are good citizens in the others are so relative to their constitutions).

Nonetheless, there are some constitutions that are called "aristocracies" that exhibit differences both in relation to oligarchically governed constitutions and in

148. *Republic* 8–9.
149. 1276b34–1277a1, 1278a17–21, 1278b1–5, 1286b3–7, 1288a37–b2.

relation to a so-called polity. For wherever officials are elected not only on the basis of wealth but also on the basis of merit, the constitution itself differs from both of these and is called "aristocratic." For even in those constitutions where virtue is not a concern of the community, there are still some who are held in high repute and believed to be decent.

Wherever, then, a constitution looks to wealth, virtue, and the people (as it does in Carthage[150]) it is aristocratic, as also are those, like the Spartan constitution, which look to only two, virtue and the people, and where there is a mixture of these two things, democracy and virtue.[151] There are, then, these two forms of aristocracy besides the first, which is the best constitution; and there is also a third, those that lean more than so-called polity toward oligarchy.

4.8
Polity (1)

It remains for us to speak about so-called polity and about tyranny. We have ordered things in this way, even though neither polity nor the aristocracies just mentioned are deviations, because in truth they all fall short of the most correct constitution, and so are counted among the deviations, and these deviations that we mentioned at the start of our discussions[152] are deviations from them [that is, from polity and aristocracy]. On the other hand, it is reasonable to treat tyranny last, because it is least of all a constitution, and our methodical inquiry is concerned with constitutions.

The cause, then, of our ordering things in this way has been stated; we must now explain about polity. For its capacity should be more evident since we have determined matters concerning oligarchy and democracy. For polity, simply speaking, is a mixture of oligarchy and democracy. But it is customary to call those mixtures that lean toward democracy "polities," and to call "aristocracies" those that lean more toward oligarchy, because education and good breeding more commonly accompany those who are richer.

Further, the rich seem to possess already the things for the sake of which unjust people do injustice, which is why the rich are called both "noble and good" and "notable." Since, then, aristocracies wish to give superiority to the best of the citizens, oligarchies too are said to consist primarily of noble and good men. And it seems to be impossible for a city to be in good legislative order if it is not governed aristocratically, but rather by wicked people, and equally impossible for one that is not in good legislative order to be governed aristocratically. But good legislative order is not having the well laid-down laws that are not obeyed. That is why one must take one sort of good legislative order to be when the laws that are laid down are obeyed,

150. 1273a21–b1
151. 1270b15–17, b25, 1271b2–3.
152. 1289a26–b5, also 1279b4–6.

and another to be when the laws that are in fact obeyed are well laid down (for there is also obedience to badly laid-down laws). The latter can come about in two ways; for people may either obey the best laws possible for them, or the unconditionally best ones.

Aristocracy seems above all to exist when offices are distributed in accord with virtue (for virtue is the defining mark of aristocracy, wealth of oligarchy, and freedom of democracy). But [control] by the belief of the majority is found in all of them; for in oligarchy, aristocracy, and in democracies, the belief of the major part of those who share in the constitution is what is in control.

In most cities the form of constitution is badly named; for the mixture aims only at the rich and the poor, at wealth and freedom; for among pretty much the majority of people the rich seem to occupy the place of noble and good men. But since there are three grounds for claiming equality in the constitution, freedom, wealth, and virtue (for the fourth, which they call "good breeding," is a consequence of two of the others; for good breeding is a combination of old money and virtue), it is evident that the mixture of the two, the rich and the poor, must be called a "polity," while a mixture of the three should most of all the others must be called an "aristocracy," except for the true and first one.

That there are other forms of constitutions besides monarchy, democracy, and oligarchy, then, and what they are, has been stated, also how aristocracies differ among themselves, and polities from aristocracy, and that they are not far apart from each other is evident.

4.9
Polity (2)

Besides democracy and oligarchy, we should—in continuity with what was said[153]—now discuss in what way a so-called polity arises, and how it should be put in place. And at the same time it will be clear what things define democracy and oligarchy; for one must get hold of the division of these things, and then make a composite out of them, taking, as it were, a token from each.

There are three defining marks of this composition and mixture: One is to take the legislation of both constitutions. For example, in the case of the administration of justice, oligarchies impose a fine on the rich if they do not serve on juries, but provide no payment for the poor, while democracies pay the poor but do not fine the rich. Common to both constitutions, and a mean between them, is doing both. That is why this is characteristic of a polity, for it is a mixture of both. This, then, is one way to couple them. **1294b1**

153. 1293b22–30.

Another is to take the mean between the orders characteristic of each. For example, in democracies membership in the assembly is either not based on a property assessment at all or on an altogether small one, while in oligarchies it is based on a large property assessment. Common here is doing neither, but rather the assessment that is in a mean between the two of them.

A third is to take things from both orders, some from oligarchic law and others from democratic law. I mean, for example, that it seems to be democratic for officials to be chosen by lot, oligarchic by election; democratic not on the basis of a property assessment, oligarchic on such a basis. It is aristocratic, therefore, and characteristic of a polity, to take one element from one and another from the other—from oligarchy, by making the officials elected, from democracy, by doing so not on the basis of a property assessment.

This, then, is the way to mix them. But the defining mark of a good mixture of democracy and oligarchy is when it is possible to say of the same constitution that it is both a democracy and an oligarchy. For it is clear that speakers speak of it in this way because the mixture is a good one. The mean too is like this, for each of the extremes is evident in it, which is precisely how things are in the case of the Spartan constitution.

For many people attempt to speak of it as a democracy, because it has many democratic elements in its order. In the first place, for example, there is the way sons are brought up (for those of the rich are brought up like those of the poor, and are educated in the way that the sons of the poor could be too). Similarly, at the next age, when they have become men, it is the same way (for it is not entirely clear who is rich and who is poor). The nourishment at the communal messes is the same for everyone, and the rich wear clothes that any poor person could also provide for himself. Further, of the two most important offices, the people elect candidates to one and share in the other (for they elect the senators and share in the overseership).

Other people, however, call the Spartan constitution an "oligarchy" because of its having many oligarchic elements. For example, all the officials are elected and none chosen by lot, a few have control to impose death and exile, and there are also many other elements of this sort. In a constitution that is well mixed, by contrast, both elements should seem to be present, and also neither, and it should be preserved because of itself and not because of external factors, and because of itself not because a majority wishes it (for that could happen in a wicked constitution too), but because none of the parts of the city as a whole would even wish for another constitution.

In what way a polity should be put in place, and likewise those constitutions that are termed aristocracies, has now been stated.

4.10
Forms of Tyranny

It remains for us to speak about tyranny, not because there is much argument about it, but so that it can take its place in our methodical inquiry, since we assign to it too a place among the constitutions. **1295a1**

We discussed kingship in our first accounts,[154] where we made an investigation into whether what is most of all called a "kingship" is disadvantageous for cities or advantageous, who should be appointed "king," from where, and in what way. And we distinguished two forms of tyranny while we were making our investigation of kingship, because their power in a way also overlaps with kingship, because both of these sorts of rule are in accord with law (for among some barbarian peoples they choose autocratic monarchs, and in former times among the ancient Greeks there were people who became monarchs in this way, the ones called "dictators"). There are certain differences between these. But both were kingly, because they were in accord with law and involved monarchical rule over voluntary subjects, and both were tyrannical, because the monarchs ruled like masters in accord with their own judgment.

There is a third form of tyranny, which is the very one that seems most of all to be a tyranny, because it is a counterpart of absolute kingship. And any monarchy is necessarily a tyranny of this sort if the monarch rules in a non-accountable way over people who are his equals or betters, with a view to his own advantage, not that of the ruled. That is precisely why it is involuntary; for no free person voluntarily puts up with rule of this sort.

The forms of tyranny are these and this many, then, due to the causes that were mentioned.

4.11
The Middle Class (1)

What is the best constitution, and what is the best life for most cities and most human beings, comparing it neither to a virtue that is beyond the reach of private individuals, nor to an education that requires natural gifts and resources that depend on luck, nor to the constitution that is in accord with our prayers, but to a life that most people can share and a constitution in which most cities can share? For the constitutions called "aristocracies," which we spoke about just now, either fall outside the reach of most cities or border on so-called polities—which is why the two must be spoken about as one.

154. 3.14–17.

But now the judgment about all these matters depends on the same elements. For if what was said in the *Ethics*[155] is correct, and a happy life is the unimpeded life that is in accord with virtue, and virtue is a mean [or middle] state, then it is necessary for the middle life to be best, the one that admits of being aimed at by each sort of person. These same defining marks must also define the virtue and vice of both a city and a constitution; for the constitution is a sort of life of a city.

1295b1 In all cities, then, there are three things that are parts of the city: the very rich, the very poor, and third those who are in the middle between these. Therefore, since it is agreed that the moderate and the middle is best, it is evident that possessing a middling amount of the goods of luck is also best of all. For that makes it easiest to obey reason, while whatever is hyper noble, hyper strong, hyper well-bred or hyper rich, or the contraries of these, hyper poor, hyper weak, or exceedingly without honor, makes it difficult to obey reason; for the first lot tend more toward committing wanton aggression and major vice, while the second lot tend too much to become doers of evil and petty wickedness. And injustices are caused in the one case by wanton aggression and in the other by evildoing. Further, those in the middle are least inclined either to avoid rule or to be eager to rule, both of which things are harmful to cities.

In addition, those who are superior in the goods of luck (strength, wealth, friends, and other things of that sort) neither wish to be ruled nor know how to be ruled. And this characteristic they acquire right from the start at home while they are still children; for because of their luxurious living they are not accustomed to being ruled even in school. Those, on the other hand, who are excessively deprived of goods of this sort are too humble. So the latter do not have the scientific knowledge of how to rule, but only how to be ruled in the way slaves are ruled, while the former do not have it of how to be ruled in any way, but only how to rule with the rule of a master.

What comes into being, then, is a city consisting of slaves and masters, but not of free people, the one group envious, the other contemptuous—which is the furthest thing from political friendship and political community; for community is fitted to friendship; for enemies do not wish to share even a road in common. But a city tends, at any rate, to consist as much as possible of people who are equal and similar, and this especially holds of those in the middle. So it is necessary for this city—the one that is composed of those we say a city is by nature composed of—to be governed in the best way.

Also, of all the citizens, those in the middle are the ones that preserve themselves most in cities. For they neither desire other people's property, as the poor do, nor do other people desire theirs, as the poor desire that of the rich. And because they are neither plotted against nor plot, they pass their time free from danger. That is why Phocylides did well to pray: "Many things are best for those in the middle. In the middle is where I want to be in a city."[156]

155. E.g., *NE* 1101a14–16.
156. Fr. 10 Diehl.

It is clear, therefore, that the political community that is due to those in the middle is best too, and that cities can be well governed where the middle class is numerous and stronger—especially if it is stronger than both of the others, or, failing that, than one of them; for it will tip the balance when added to either and prevent opposing excesses from arising. That is why it is the height of good luck if those in the governing body own a middling and adequate amount of property, because when some people own an excessive amount and the rest own nothing, either extreme democracy arises or unmixed oligarchy or—as a result of both excesses—tyranny; for in fact tyranny arises from the most vigorous sort of democracy and from [unmixed] oligarchy, but much less often from middle constitutions or those close to them. We will state the cause of this later on when we speak about constitutional changes.[157]

It is evident that the middle constitution is best, then; for it alone is free from factional conflict; for where there are many people in the middle, factions and disagreements least occur among the citizens. And large cities are freer from factional conflict due to the same cause, that the middle class is numerous. In small cities, on the other hand, it is easy to divide all the citizens into two, so that no middle class is left and pretty much everyone is either poor or rich. And democracies are more stable and longer lasting than oligarchies because of those in the middle (for they are more numerous in democracies than oligarchies and share in office more), since when, without these, the poor are predominant in number, failure occurs and things are quickly ruined. It should be regarded as a sign of this that the best legislators have come from the middle citizens; for Solon was one of these, as is clear from his poems, as were Lycurgus (for he was not a king), Charondas, and pretty much most of the others.

It is also evident from these considerations why most constitutions are either democratic or oligarchic. For because the middle class in them is often small, whichever of the others is superior—whether the property owners or the people—distances itself from the middle class and conducts the constitution to suit itself, so that either a democracy comes about or an oligarchy.

In addition to this, because of the factions and fights that occur between the people and the rich, whenever one side or the other happens to be stronger than its opponents, they put in place neither a communal constitution nor an equal one, but take their superiority in the constitution as a reward of their victory and make in the one case a democracy and in the other an oligarchy.

Further, those who achieved leadership in Greece[158] have looked to their own constitutions and put in place either democracies or oligarchies in cities, targeting not the advantage of the cities but their own, so that, because of this, the middle constitution has either never come about or has done so rarely and in few places; for

157. 1308ᵃ20–24, 1310ᵇ3–7, 1312ᵇ34–38.
158. Athens and Sparta.

one man alone,[159] among those who have previously held positions of leadership, has ever allowed himself to be persuaded to introduce this sort of order, and it has now become customary for those in cities not even to wish for equality, but either to seek rule or to put up with being dominated.

What the best constitution is, then, and why it is so, is evident from these considerations. As for the other constitutions (for there are, we say, several sorts of democracies and of oligarchies), which of them is to be counted as first, which as second, and so on in the very same way, in accord with whether it is better or worse, is not difficult to see now that the best has been determined. For the one nearest to this is of necessity always better and one further from the middle constitution worse—provided one is not judging relative to a hypothesis. I say "relative to a hypothesis," because it often happens that, while one constitution is more choiceworthy, nothing prevents a different one from being more advantageous for some [cities].

4.12
The Middle Class (2)

What constitution is advantageous for what [city], and what sort of constitution for what sort of city, is the next thing to go through after what has been said. First, though, a general point must be grasped about all of them, that the part of a city that wishes the constitution to endure must be stronger than the part that does not. But every city is made up of both quality and quantity. By "quality" I mean freedom, wealth, education, and good breeding; by "quantity" I mean superiority in numbers. But it is possible that the quality belongs to one of the parts of which a city is composed, while the quantity belongs to another. For example, the ill-bred may be more numerous than the wellborn or the poor more numerous than the rich, but yet the one may not be as superior in quantity as it is inferior in quality. That is why these have to be judged in relation to each other.

Where the multitude of poor people is superior in the proportion mentioned, it is natural for a democracy to exist, with each form of democracy corresponding to the superiority of each [form of] the people. For example, if the multitude of farmers is predominant, it will be the first sort of democracy, if the unrefined ones and wage earners are, the last sort, and similarly for the others in between these. But where the multitude of those who are rich and notable is more superior in quality than it is inferior in quantity, there an oligarchy [is natural], with each sort of oligarchy corresponding in the same way to the superiority of the multitude of oligarchs.

The legislator, however, should always add on those in the middle in his constitution; for if he is setting up oligarchic laws, he should aim at those in the middle, and if democratic ones, he must draw in those in the middle by these laws. And where

159. Identity unclear.

the multitude of those in the middle predominates either over both of the extremes together, or even only over one of them, it is possible to have a constitution that is steadfast. For there is no fear that the rich and the poor will ever conspire together against these; for neither will ever want to serve as slaves to the other, while if they look for a constitution that is more communal, they will find none other than this one. For they would not put up with ruling in turn, because they distrust each other. Everywhere an arbitrator is most trusted, and the middling person is an arbitrator.

The better mixed a constitution is, the more steadfast it is. But many of those who wish to produce aristocratic constitutions make the mistake not only of granting more to the rich, but also of deceiving the people. For sooner or later, false goods necessarily give rise to a true evil; for the attempts of the rich to get more destroy the constitution much more than those of the people do.

4.13
Subtle Devices Used in Constitutions

The subtleties devised in constitutions as pretexts to deceive the people are five in number, and concern the assembly, the offices, the courts, the possession of weapons, and athletic training. As regards the assembly: allowing all citizens to attend assemblies, but imposing a fine on the rich for not attending, either only on them or a much heavier one on them. As regards offices: not allowing those with an assessed amount of property to be excused under oath, but allowing the poor to be excused. As regards the courts: fining the rich for not serving on juries, but allowing the poor not to do so, or else imposing a large fine on the former and a small one on the latter—as in the laws of Charondas.[160] In some places, everyone who has registered may attend the assembly and serve on juries, but once they have registered, if they do not attend or serve, heavy fines are imposed on them. The aim is to get people to avoid registering because of the fine, and not to serve or attend because of not being registered. They legislate in the same way about possessing weapons and athletic training. For the poor are permitted not to possess weapons, but the rich are fined if they do not, and if they do not train, there is no fine for the former, but the latter are fined. That way the rich will share because of the fine, while the poor, not being in danger of it, will not share.

These subtle devices of legislation are oligarchic. In democracies, by contrast, there are subtleties devised that are contrary to these. For while the poor are paid to attend the assembly and serve on juries, the rich are not fined at all [for failing to]. So it is evident that if one wishes to have a just mixture, one must combine elements from both sides, and pay the poor while fining the rich; for in this way everyone would share, while in the other way the constitution comes to be in the hands of one side only.

160. $1274^{b}5$–8.

1297b1 A polity should, however, be composed only of those who possess weapons. But it is impossible to define the size of the relevant property assessment unconditionally, and say that it must be so-and-so much. We should instead look for what sort of amount[161] is the largest that would let those who share in the constitution outnumber those who do not, and fix on that. For the poor are willing to keep quiet even when they do not share in office, provided no one treats them with wanton aggression or takes away any of their property—but this is not easy to do; for those who do share in the governing body are not always refined people. And people are in the habit of shirking in time of war if they do not receive provisions and are poor—although if nourishment is provided, they wish to fight.

In some places, the polity consists not only of those who are serving as hoplites but also of those who have so served in the past. In Malia, the constitution consisted of both, although the officials were elected from among the active soldiers. Also, the first constitution that came about among the Greeks after the kingships consisted of the warriors. At the start, it consisted of the cavalrymen (for strength and superiority in war lay in them; for without orderly formations the hoplite element is useless, and experiences in such things and orderly formations did not exist among the ancients, so that their strength lay in their cavalry). But as cities grew larger, and those with hoplite weapons became a stronger force, more people shared in the constitution. That is why what we now call "polities" used to be called "democracies." The ancient constitutions, on the other hand, were oligarchic and kingly, and reasonably so. For because of their small population they did not have much of a middle class, and so the people, because they were inferior in number and in organization, put up with being ruled.

What the causes are, then, of there being several constitutions, and why there are others besides those spoken about (for democracy is not one in number, and likewise neither are the others), and further, what their differences are, and due to what cause they arise, and, in addition to this, which constitution, speaking for the majority of cases, is best, and which among the others fits which sort of city, have now been stated.

4.14
The Deliberative Element in a Constitution

Let us again, in connection with what comes next, discuss constitutions in common and each one separately, taking the starting-point that is appropriate to these issues. There are, then, three parts in all constitutions by reference to which an excellent legislator must get a theoretical grasp on what is advantageous for each constitution. When these parts are in good condition, the constitution is necessarily in good

161. Reading ποῖον.

condition, and constitutions differ from each other by differing in each of these parts. One of the three parts is the one that deliberates about communal affairs; the second concerns the offices, that is to say, which offices there should be, with control of what things, and in what way officials should be chosen; and the third is the one that judges suits. **1298ᵃ1**

The deliberative part has control concerning war and peace and the making and breaking of alliances, concerning laws, and concerning death, exile, and the confiscation of property, and concerning the election and inspection of officials. And it is necessary that either all these sorts of judgments be assigned to all the citizens; or all to some of them (to some single office, for example, or to several, or some to some and others to others); or some to all and some to some.

For all to deliberate about all issues is characteristic of a democracy; for this is the sort of equality the people seek. But there are several ways of having all of them do so. One way is by turns rather than all together, as in the constitution of Telecles of Miletus. And there are other constitutions in which deliberation is carried out by boards of officials meeting jointly, and all enter office by turn from the tribes and from the smallest parts of the city, until all have been gone through, and they all meet together only to consider legislation, and matters pertaining to the constitution, and to listen to official announcements. Another way is where they all meet, but only for the choosing of officials, for legislation, matters of war and peace, and for inspections, while other matters are deliberated on by the officials assigned to deal with the particular area in question, these being chosen from all the citizens either by election or by lot. Another way is for the citizens to meet together about offices and inspections, and to deliberate about war and alliances, and for other matters to be dealt with by offices which as far as possible are filled by election, these being the ones where it is necessary to have people ruling who have scientific knowledge. A fourth way is for all to meet and deliberate about all matters, while the officials make no judgments, but only prepare issues for judgment. This is the way in which the final democracy[162] is managed as things stand, the one we say is analogous to a dynastic oligarchy or a tyrannical monarchy. All these ways, then, are democratic.

But for certain people to deliberate about all matters is oligarchic. But here too there are several differences. For when they are chosen on the basis of more moderate property assessments, and there are more of them because of the moderateness of the assessments, and where they do not attempt to make changes that the law forbids, but rather follow it, and where everyone who has the assessed amount may share—a constitution of this sort is certainly an oligarchy, but because of its moderateness, one with the character of a polity. When not everyone shares in deliberation but only those elected, and when, as before, they rule in accord with law, it is oligarchic. When those who have control of deliberation elect themselves, and when son succeeds father, and they have control of the laws, this order is necessarily most oligarchic. **1298ᵇ1**

162. 1292ᵃ4–37.

But, when some have control of some matters—for example, when all have it over war and peace and inspections, while officials, who are elected and not chosen by lot, have it in the other areas, it is an aristocracy or[163] a polity. But if it happens that elected officials have control in some areas, while officials chosen by lot (either unconditionally or from a pre-selected group) have it in others, or if elected officials and officials chosen by lot share control, some of these are features of an aristocratic constitution and others of polity itself.

This is the way, then, that the deliberative part is distinguished in the various constitutions, and each constitution administers matters in accord with the determinations that were mentioned.

In the sort of democracy that now seems most of all to be a democracy (I mean the sort in which the people have control even over the laws), it is advantageous from the point of view of improving deliberation to do precisely the same thing as is done in oligarchies in regard to the courts (for they assign a fine for those people they want to have on juries to ensure that they serve as judges, while democrats pay the poor). Absolutely the same should be done in the case of assemblies too (for they will deliberate better if all deliberate together, the people with the notables, and the latter with the multitude). It is advantageous too if those who do the deliberating are elected or chosen by lot in equal numbers from these parts. And even if the democrats among the citizens are greatly superior in numbers, it is advantageous either not to provide pay for all of them, but only for a number commensurable with the number of notables, or to exclude the excess by lot.

In oligarchies, on the other hand, it is advantageous either to choose some additional people from the multitude or to establish a board of officials (like the so-called preliminary councilors or law-guardians that exist in some constitutions), and then [have the assembly] transact only the business that these have considered first (for, in this way, the people will share in deliberation, but will not be able to abolish anything concerning the constitution). Further, it is advantageous to have the people vote on decrees that are either the same as those brought before them [by the board], or on nothing contrary to them, or else to let all give advice and have only officials deliberate. Also, one should do the opposite of what happens in polities. For one should make the multitude have control when vetoing decrees but not when approving them; in the latter case, they must be referred back to the officials instead. For in polities they do the reverse; for the few have control when vetoing decrees but not when approving them, decrees of the latter sort always being referred back to the majority instead.

Concerning the deliberative part, then, and the part that has control of the constitution, let matters be determined in this way.

163. Reading ἢ.

4.15
Offices

Next after these things is the division of the offices. For this part of a constitution too has many differences: how many offices there are and with control of what things; and with regard to time—how long each office is to last (for some make it six months, others less, some make it a year, others a longer period), and whether the offices should be held permanently or for a long time, or neither of these, but instead the same people may hold office several times, or the same person not even twice but only once; further, as regards the appointment of officials—from whom they should come, by whom chosen, and in what way. Concerning all these one should be able to distinguish how many modes there can be, and then fit the sorts of offices to the sorts of constitutions for which they are advantageous.

But even that much is not easy, to determine what are to be called "offices"; for a political community needs many sorts of supervisors, which is why not everyone who is chosen by vote or by lot can be regarded as an official. In the first place, for example, there are the priests (for a priesthood must be counted as something other than and beyond the political offices). Further, patrons of the theater and heralds are elected, as are ambassadors. But some sorts of supervision are political, either concerned with all the citizens involved in a certain action (as a general supervises those who are serving as soldiers), or some part of them (as the supervisor of women or the supervisor of children). Some are related to household management (for grain rationers are often elected), while others belong to assistants (and to these, if they have the resources, they assign slaves).

Simply speaking, however, those that must most of all be called "offices" are those responsible for deliberating about certain matters, for judging, and for prescribing [what is to be done], and above all the latter; for issuing prescriptions is more characteristic of ruling. But this makes (one might almost say) no difference as regards use (for as yet no judgment has been handed down to anyone disputing over the name), although there is some further study for thought to do on it.

What sorts of offices, and how many, are necessary for the existence of a city, and what sorts, though not necessary, are yet useful for an excellent constitution, are puzzles one might raise with regard to every constitution, but especially with regard to small cities.[164] For in large cities one can and should assign a single office to a single work (for because there are many citizens, there are many people to take up office, so that some offices are held again only after a long interval and others are held only once, also each work is better performed when its supervision is engaged in one thing rather than being engaged in many things). In small cities, on the other hand, many offices have to be co-assigned to a few people (for underpopulation makes it **$1299^{b}1$** hard to have many people in office; for who will succeed them in their turn?). But

164. Listed in 6.8.

sometimes small cities need the same offices and laws as large ones, except that the latter need the same ones often, while the former need them only at long intervals. That is why nothing prevents their assigning many sorts of supervision [to the same officials] at the same time (for they will not impede each other), and why, because of underpopulation, they must make their boards of officials like spit-lamps.

If, then, we can say how many offices it is necessary for every city to have, and how many are not ones it is necessary for it to have but that it should have, it will be easier, in the light of this, to determine which offices it is fitting to combine into a single office. But it is also fitting not to overlook the question of which matters should be supervised by numerous local offices, and which a single office should everywhere have control of. For example, in the case of good order whether a market manager should have control of this in the marketplace, and another official in another place, or the same one everywhere; and whether offices should be distinguished by the thing or by the people [they deal with]—I mean, for example, whether there should be a single office for good order, or one for children and another for women.

And with regard to the constitutions too, whether the kind of offices also differs in each constitution, or not at all. For example, whether in a democracy, an oligarchy, an aristocracy, and a monarchy, the same offices have control, even though they are not filled from equal or even similar people, but from different sorts in different constitutions (for example, from the well educated in aristocracies, from the rich in oligarchies, and from the free in democracies), or whether certain offices exist that are, for their part, in accord with these differences, with sometimes the same offices and sometimes different ones being advantageous (for it is fitting for the same offices to be large in some places and small in others).

Nonetheless, some offices are indeed special [to certain constitutions]—for example, that of the preliminary councilors; for it is non-democratic. A council, by contrast, is democratic; for there must be some body of this sort to take care of preliminary deliberation on behalf of the people, so they can do their work. It is oligarchic, though, if the councilors are few in number. But the preliminary councilors are necessarily few in number, so that their office is oligarchic. Where both these offices exist, however, the preliminary councilors are put in place as a check on the councilors; for a councilor is democratic, a preliminary councilor, oligarchic. But the power of the council is also destroyed in those sorts of democracies in which it
1300a1 is the people themselves who come together and transact all business. This happens when there is wealth of the sort that provides pay to those who attend the assembly; for they then have the leisure to meet often and judge everything themselves. But the supervisor of women, the supervisor of children, and any other office that has control of this sort of supervision are aristocratic, not democratic (for how can one prevent the women of the poor from going out?) or oligarchic (for the women of oligarchs live luxuriously).

Concerning these issues let this much be determined for now, but concerning the appointment of officials, we must attempt to go through things from the start.

Differences here lie in three defining marks, the combination of which necessarily yields all the modes. Among these three, the first is who appoints the officials, second, from whom, and, lastly, in what way. And of each of these three there are three different sorts. Either all the citizens appoint or some do; and they appoint either from all or from certain determinate groups (determined by a property assessment, for example, or by breeding, or by virtue, or by some other feature of that sort—as in Megara where they appointed from those who returned from exile together and fought together against the people); and they appoint either by election or by lot; and, again, these may be coupled—I mean that all may appoint to some offices and some to others, some offices may be appointed from all and others from some, and some may be appointed by lot and others by election.

In the case of each of these differences, there will be four[165] modes. Either all appoint from all by election or all appoint from all by lot; or all appoint from some by election; or all appoint from some by lot (and, if from all, either by sections—by tribe, for example, or by deme or clan, until all the citizens have been gone through—or from all on every occasion); or partly in the first way and partly in the second. Again, if only some appoint, they may do so either from all by election or from all by lot; or from some by election or from some by lot; or partly in the first way and partly in the second—I mean, partly from all by election and partly by lot, and partly from some by election and partly by lot. This gives rise to twelve modes that are separate from the two couplings.

Among these ways of appointing, three are democratic, when all appoint from all by election, by lot, or by both (that is, for some offices by election and for some by lot). But when not all appoint at the same time, but do so from all or from some, whether by election, lot, or both, or from all for some offices and from some for others, whether by election, lot, or both (by "both" I mean some by lot and others by election)—it is characteristic of a polity. When some appoint from all, whether by election, lot, or both (for some offices by lot, for others by election), it is oligarchic—although it is more oligarchic to do so by both. But when some offices are appointed from all and others from some or when some are appointed by election and some by lot, this is characteristic of an aristocratically governed constitution. When some **1300b1** appoint from some by election, it is oligarchic, also when some appoint from some by lot (even if this does not actually occur), and when some appoint from some in both ways. But when some appoint from all, and when all appoint from some by election, it is aristocratic.

These, then, are the number of modes of appointing to offices, and this is the way they are divided in accord with the constitutions. Which are advantageous for which constitutions, and how appointments are to be made, will become evident once we determine the powers of the offices, and which these are. By the "power" of an office I mean, for example, control of revenues or control of defense—for the form of power

165. Reading τέσσαρες.

that is like the one belonging to a generalship is different from that belonging to control of marketplace contracts.

4.16
The Judicial Element

Among the three parts,[166] it remains to speak about the judicial. And the modes of these [offices] must be grasped in accord with the same hypothesis. There is a difference between courts that lies in three defining marks: from whom; about what; and in what way. "From whom": I mean whether they are appointed from all or from some. "About what": how many forms of courts there are. "In what way": whether by lot or election.

First, then, let us determine how many forms of courts there are. They are eight in number. One is the court of inspection of officials. Another is concerned with cases in which someone does something unjust in some matter concerning the community does something unjust. Another is concerned with matters that bear on the constitution. A fourth is concerned with officials and private individuals in disputes about fines. A fifth is concerned with private transactions of some magnitude. Besides these there is a court that is concerned with homicide and one that is concerned with aliens.

The forms of homicide court, whether having the same juries or not, are that concerned with premeditated homicide, that concerned with involuntary homicide, that concerned with cases where the fact is admitted but the justice of it disputed, and a fourth concerned with charges brought against those who have been exiled for homicide after their return (the court of Phreatus[167] in Athens is said to be an example), but cases of this sort are rare at any time even in large cities. The aliens' court has a part for aliens disputing with aliens and a part for aliens disputing with citizens.

Further, besides all these, there is a court that is concerned with petty transactions: those involving one drachma, five drachmas, or a little more (for judgment must be given in cases of this sort too, but it should not fall to a multitude of judges to give it).

But let us set aside these courts, as well as the homicide and aliens' courts, and speak about the political ones, which, when not well managed, give rise to disagreements and constitutional changes. Of necessity, either all judge all the cases just now distinguished, and are appointed either by lot or by election; or all judge all of them and some are appointed by lot and some by election; or, although dealing with the same cases, some judges may be appointed by lot and some by election. These modes, then, are four in number.

1301a1

There are as many too when appointment is from only some of the citizens. For here again either the juries are appointed from some by election and judge all cases;

166. 1297b36–1298a3.
167. *Ath*. 57.3.

or they are appointed from some by lot and judge all cases; or some may be appointed by lot and some by election; or some courts dealing with the same cases may be composed of both allotted and elected members. These modes, as we said, are the counterparts of the ones we mentioned previously. Further, these same ones may be conjoined—I mean, for example, some may be appointed from all, others from some, and others from both (as, for example, if the same court had juries appointed partly from all and partly from some); and the appointment may be either by lot or by election or by both.

How many modes the courts admit of, then, has now been stated. Among these, the first, those which are appointed from all and judge all cases, are democratic. The second, those which are appointed from some and judge all cases, are oligarchic. The third, those which are partly appointed from all and partly from some, are aristocratic or characteristic of a polity.

BOOK 5

5.1
Changing and Preserving Constitutions

Pretty much all the other issues, then, that we deliberately decided on have been spoken about. And after what has been said, what must next be investigated are the sources of change in constitutions, how many they are and of what sort; what things destroy each constitution; from what sort into what sort they mostly change; further, what things preserve constitutions in general and each constitution in particular; and, finally, the means by which each constitution is best preserved.

One should first take as a starting-point that many constitutions have come into existence because, though everyone agrees about justice and proportional equality, they are in error about it, as was also said previously.[168] For democracy arose from those who are equal in some respect, thinking themselves to be unconditionally equal (for, because they are equally free, they think they are unconditionally equal). Oligarchy, on the other hand, arose from those who are unequal in some respect, taking themselves to be wholly unequal (for, because they are unequal in property, they take themselves to be unconditionally unequal). And so the former claim to be worthy of an equal share of everything, on the grounds that they are all equal, while the latter, because they are unequal, seek to get more (for a bigger share is an unequal one). All these constitutions, then, have a certain sort of justice, although unconditionally they are mistaken. And it is due to this cause that, when one or other of them does not share in the constitution in accord with the supposition [about justice] they

168. 1280ᵃ7–25, 1282ᵇ14–23.

happen to have, they engage in faction. But those who would most have justice on their side in engaging in faction, though the least likely to do so, are those who are outstanding in virtue; for they alone are the ones it is most reasonable to regard as unconditionally unequal. There are also certain people, those who are superior in family, who suppose that they are not worthy of merely equal things, because they are unequal in this way; for people are believed to be noble when they have ancestral virtue and wealth.

These, then, are (one might almost say) the starting-points and springs of factions—the sources from which people engage in faction. That is also why the changes are twofold. For sometimes people engage in faction against the constitution in order to change from the one that is in place to one of another sort—for example, from democracy to oligarchy, or from oligarchy to democracy, or from these to polity or aristocracy, or from the latter to the former. Sometimes, though, they engage in faction not against the constitution that is in place (for example, an oligarchy or a monarchy), which they deliberately choose to keep the same, but wish it to be in their hands. Further, it may be a question of more or less—for example, where there is an oligarchy, the aim may be to make it more oligarchically ruled or less so; where there is a democracy, to make it more democratically ruled or less so; and similarly, in the case of the remaining constitutions, the aim may be to tighten or loosen them. Further, the aim may be to change a certain part of the constitution—for example, to put in place or abolish a certain office, as some say Lysander tried to abolish the kingship in Sparta, and King Pausanias the overseership. In Epidamnus too the constitution was changed with regard to one part (for a council replaced the tribal rulers, though it is still the case that only those members of the governing body who hold office are obliged to attend the public assembly when election to office is taking place—the single [supreme] official was also an oligarchic feature of this constitution).

For faction is everywhere due to inequality, when unequals do not receive what is proportional (for a permanent kingship is unequal if it exists among equals); for people generally engage in faction in pursuit of equality. But equality is twofold, numerical equality and equality in accord with worth. By "numerical equality" I mean being the same and equal in number or size; by "equality in accord with worth," what is the same and equal in ratio. For example, in number, three exceeds two and two exceeds one equally, but in ratio, four exceeds two and two exceeds one equally; for two and one are equal parts of four and two; for both are halves.

But, though people agree that what is unconditionally just is what is in accord with worth, they still disagree, as was said previously,[169] since some regard themselves as wholly equal if they are equal in a certain respect, while others claim to be worthy of inequality in everything if they are unequal in a certain respect. That is also why two constitutions mostly arise: democracy and oligarchy; for good breeding and virtue are found in few people, while these things [freedom (democracy) and wealth

169. 1301a25–28.

(oligarchy)] are more widespread; for no city has a hundred good and well-bred men, **1302ᵃ1**
but there are rich ones in many places.[170]

For a constitution to be ordered simply and entirely in accord with either sort of equality, however, is bad. This is evident from what actually happens; for no constitution of this sort is steadfast. The cause of this is that it is impossible, when the first 5
thing—the starting-point—is in error, for the result not to be in the end something bad. That is why numerical equality should be used in some cases, and equality in accord with worth in others.

Nonetheless, democracy is more stable and freer from factional conflict than oligarchy. For in oligarchies, two sorts of faction arise, one among the oligarchs themselves, and another again against the people. In democracies, on the other hand, the 10
only faction is against the oligarchic element, since no faction worth mentioning arises among the people themselves against themselves. Further, a constitution based on those in the middle is closer to a democracy than to an oligarchy, and this one is the most stable constitution of these sorts. 15

5.2
Principal Starting-Points of Political Change

Since we are investigating the sources from which both factions and changes arise in constitutions, their starting-points and causes must first be grasped in universal terms. There are, then, pretty much three in number, each of which must first be defined in outline by itself. For one should grasp the disposition of people who 20
engage in faction; for the sake of what they do so; and, third, what the starting-points are of political disturbances and factions among people.

Of people's being in some way disposed to change [their constitution], then, what is most of all to be counted as the universal cause is the one we have in fact already mentioned.[171] For those who pursue equality engage in faction when they believe that they get less, even though they are the equals of those who get more, while 25
those who pursue inequality (that is to say, superiority) do so when they believe that, though they are unequal, they are not getting more, but rather the same or less (but it is possible, sometimes to desire these things justly, sometimes unjustly); for those who are inferior engage in faction in order to be equal, while those who are equal do so in order to be superior. The disposition of those who engage in faction has now 30
been stated.

The things about which people engage in faction are profit, honor, and the contraries of these. For people also engage in faction in cities to avoid dishonor and fines, either for themselves or for their friends.

170. Rejecting the addition of καὶ ἄποροι.
171. 1301ᵃ33–35, 1301ᵇ35–39.

The causes and starting-points of the changes—the sources that dispose people to feel in the way described about the issues mentioned—happen in one way to be seven in number and in another more. Two of them are the same as those just mentioned, but not in the same way; for people are also stirred up against each other by profit and honor not simply in order to get them for themselves, which is what was said previously, but because they see others, some justly and some unjustly, getting more of these. Other causes are wanton aggression, fear, superiority, contempt, and disproportional growth. Still others, although operating in another way, are intrigue, contempt, small differences, and dissimilarity.

5.3
Particular Starting-Points of Political Change (1)

Among these, the capacity that wanton aggression and profit have and how they are causes are pretty much evident; for it is when officials are wantonly aggressive and want to get more that people engage in faction both against each other and against the constitutions that gave the officials control. And their getting more is sometimes at the expense of private, sometimes at the expense of communal, funds.

It is also clear what honor has the capacity to do and how it is a cause of faction; for people engage in faction both when they are dishonored themselves and when they see others being honored. These things occur unjustly when people are honored or dishonored contrary to their worth, justly, when in accord with their worth.

Faction arises because of superiority when someone (an individual or a group of individuals) is greater in power than is in accord with the city and the power of the governing body; for when there are people like that a monarchy or a dynasty usually arises. That is why some places, such as Argos and Athens, have a practice of ostracism. And yet it is better to see to it from the start that no people with so great a superiority arise than to supply a remedy after having allowed it to happen.

People engage in faction because of fear both when they have committed injustice and are afraid of punishment and when they think they are about to suffer injustice and wish to take preemptive action before they suffer injustice. The latter occurred in Rhodes[172] when the notables united against the people because of the suits being brought against them.

People also engage in faction and attack each other because of contempt. For example, this occurs in oligarchies when those who do not share in the constitution are a majority (for they consider themselves the stronger party), and in democracies, when the rich are contemptuous of the disorder and anarchy. For example, the democracy in Thebes was destroyed because they were governed in a bad way after the battle of Oenophyta, as was the democracy of the Megarians when they were defeated

172. Presumably the event referred to at 1302b32–33 and 1304b27–31.

because of disorder and anarchy, and [it was the same story] in Syracuse, before the tyranny of Gelon, and in Rhodes prior to the revolt.[173]

Constitutional changes also occur because of disproportional growth. For a body is composed of parts, and these must grow in proportion if symmetry is to be maintained, and if it is not, the body will be destroyed—as, for example, when a foot is four cubits[174] long and the rest of the body two spans,[175] or, if the disproportional growth is not only quantitative but also qualitative, its shape might change to that of another animal.[176] So, similarly, a city too is composed of parts, one of which often grows without being noticed—for example, the multitude of the poor in democracies or polities. **1303[a]1** This sometimes also happens because of luck. At Tarentum, for example, a democracy arose from a polity when many notables were killed by the Iapygians shortly after the Persian Wars.[177] In Argos too, after the men of the seventh were killed by the Spartan Cleomenes,[178] the notables were compelled to admit some of their subject peoples to citizenship. And in Athens, when they had bad luck fighting on land, the notables were reduced in number, because at the time of the war against Sparta[179] service in the army was based on the citizen register. This sort of change also occurs in democracies, although to a lesser extent; for when the rich become more numerous or their properties increase in size, democracies change into oligarchies or dynasties.

But constitutions also change without the occurrence of faction, both because of intrigue, as happened in Heraea (for they replaced election with selection by lot because of this, because those who intrigued were getting elected), and also because of neglect, when people who are not friendly to the constitution are allowed to occupy the offices with supreme control. Thus the oligarchy in Oreus was overthrown when Heracleodorus became one of the officials and established a polity, or rather a democracy, from the oligarchy.[180]

Further, constitutions change because of a small difference. I mean by "small" that often a great change in the laws occurs unnoticed when something small is overlooked. In Ambracia, for example, the property assessment was small, but in the end people with no property came to hold office, the assumption being that the small is very close to, or no different from, none.

Not belonging to the same race also tends to cause faction, until people join together; for just as a city does not arise from any random multitude, neither does it arise in a random period of time. That is why most of those who have admitted

173. 1302[b]23–24.
174. Approximately six feet.
175. Approximately fifteen inches.
176. *GA* 768[b]27–37.
177. In 473 BC.
178. The battle referred to was fought at Sepeia c. 495 BC. It is unclear why "the men of the seventh" were so called.
179. The Peloponnesian War (431–404 BC).
180. In 377 BC.

co-colonists or late-colonists have experienced factional conflict. The Achaeans co-colonized Sybaris with the Troezenians, but later, when the Achaeans became more numerous, they expelled the Troezenians (this was the cause of the curse that fell on the Sybarites).[181] In Thurii too, Sybarites came into conflict with their co-colonists (for when they claimed to be worthy of a larger share on the grounds that the territory was theirs, they were expelled). In Byzantium too the late-colonists were discovered plotting against the original colonists and were expelled because of a battle. The Antissaeans expelled by combat the Chian exiles they had admitted. The Zanclaeans were themselves expelled by the Samians they had admitted.[182] The Apolloniates on the Black Sea engaged in faction after admitting late-colonists.[183] The Syracusans, after the period of the tyrants,[184] when they granted citizenship to foreigners and **1303b1** mercenaries, engaged in faction and broke into battle. The Amphipolitans admitted late-colonists from Chalcis and were almost all expelled by them.

{In oligarchies, as was said previously,[185] the many engage in faction on the grounds that they are treated unjustly because they do not share equally, in spite of being equal. In democracies, the notables do so because they do share equally, in spite of not being equal.}[186]

Cities sometimes also engage in faction because of their location, when the condition of their territory is not naturally well suited for there being one city. In Clazomenae, for example, the inhabitants of Chytrus[187] came into conflict with those on the island, as did the inhabitants of Colophon and those of Notium. At Athens too the people are not all alike, but those in Piraeus are more democratic than those in the city proper.

For just as in war, where crossing even small ditches breaks up the phalanx, so too every difference seems to produce disagreement. The greatest disagreement is presumably between virtue and vice; next that between wealth and poverty; and so on for the others, including the one just discussed, with each one greater than the next.

5.4
Particular Starting-Points of Political Change (2)

Factions arise, then, not about small things, but out of small things—it is about important things that people engage in faction. Even small factions become especially strong, however, when they arise among those in control—as happened, for example,

181. The precise nature of the curse is unknown, but driving out fellow colonists would have been viewed as an act of great sacrilege.
182. Herodotus 6.22–24.
183. 1306a7–9.
184. I.e., after the fall of Thrasybulus in 467 BC.
185. 1301a25–35, 1301b35–40.
186. This paragraph seems out of place.
187. Reading Χύτρῳ. The site is unknown.

in Syracuse in ancient times. For the constitution was changed because two young men in office engaged in faction over a love affair. For, while the first was away, the second, who was his comrade, seduced his boyfriend. The first, enraged at him, retaliated by inducing the second's wife to commit adultery. For this reason they drew the governing body into their disagreement and split everyone into factions. That is precisely why one should be circumspect when such things are starting, and dissolve the factions of leaders and powerful men; for the error arises in the starting-point, and the starting-point is said to be half the whole, so that even a small error in it is comparable to [all] the errors made at the later stages.

Factions among the notables generally make the whole city share in the "enjoyment," as happened in Hestiaea, for example, after the Persian Wars when two brothers quarreled about the division of their inheritance; for the poorer one, claiming that his brother had not declared the true value of the property or of the treasure their father had found, enlisted the aid of the people, and the other, who had much property, enlisted the aid of the rich. In Delphi, a quarrel arising because of a marriage alliance was the starting-point of all the subsequent factions; for the bridegroom came to fetch the bride, but some accident occurred that he interpreted as a bad omen, and he left **1304ª1** without her. Her family, on the grounds that they had been treated with wanton aggression, planted some sacred objects on him while he was sacrificing and then killed him as a temple robber. In Mytilene too a faction concerning heiresses was the starting-point of many evils and, in particular, of the war with the Athenians, in which Paches captured their city. For a rich citizen named Timophanes left behind two daughters, and when Dexander, who wanted to obtain them for his own sons, had his suit rejected, he started a faction and incited the Athenians, whose agent he was, to interfere. Among the Phocians, a conflict arose over an heiress, involving Mnaseas the father of Mnason and Euthycrates the father of Onomarchus, which conflict was the starting-point of the Sacred war for the Phocians.[188] And in Epidamnus the constitution was changed because of matters having to do with a marriage;[189] for a man had betrothed his daughter, and the father of the one to whom he had betrothed her, becoming one of the officials, imposed a fine on him, whereupon the first allied himself with all those who were outside the constitution on the grounds that he had been insulted.

Constitutions also change to oligarchy, democracy, and polity as a result of some office or part of the city acquiring high repute or increasing in size. For example, the council of the Areopagus, which was held in high repute in the Persian Wars, was believed to have made the Athenian constitution tighter.[190] And, in return, the seafaring mob—having been the cause of the victory at Salamis,[191] and, as a result of this, of the [Athenian] hegemony due to their power at sea—made the democracy stronger. In Argos, the notables, having acquired prestige in connection with the battle against

188. 355–347 BC.
189. $1301^{b}21$–26 may describe the same change.
190. *Ath*. 41.2.
191. 480 BC.

the Spartans at Mantinea,[192] undertook to overthrow the democracy. In Syracuse, the people, having been the cause of victory in the war against the Athenians, changed the constitution from a polity to a democracy.[193] And in Chalcis, the people, together with the notables, overthrew the tyrant Phoxus, and then immediately took control of the constitution. Similarly, in Ambracia, the people joined with the opponents of Periander to expel him and afterward took the constitution into their own hands.[194] Generally speaking, then, this should not be overlooked, that the people who come to be responsible for a city's power—whether private individuals, officials, tribes, or, in general, a part or multitude of any sort whatever—stir up faction; for either those who envy them for being honored start a faction, or they themselves, because of their superiority, are unwilling to remain on equal terms.

Constitutions also undergo change when parts of a city that are believed to be opposed to each other, such as the rich and the people, become equal to each other, **1304b1** and there is an altogether small middle class; for if either of the parts becomes greatly superior, the remaining one will be unwilling to risk going up against the manifestly stronger one. That is why those who are superior in virtue do not produce (one might almost say) any faction; for they are few against many.

Universally, then, in all constitutions, the starting-points and causes of factions and changes have this mode of operation. But people change constitutions sometimes through force, sometimes through deceit. When it is through force, they use compulsion either right from the start or later on. In fact, deceit is also twofold. For sometimes, after having used deceit at first, they change the constitution while the others accept it voluntarily, and then later keep hold of it by force, when the others accept it involuntarily—for example, the Four Hundred deceived the Athenian people by telling them that the king of Persia would provide money for the war against the Spartans, and, having deceived them, tried to keep the constitution in their own hands.[195] At other times, they persuade them from the start, and later on again, due to their being persuaded, rule them with their voluntary consent.

Putting it simply, then, changes occur in all constitutions on the basis of what has been stated.

5.5
Political Change in Democracies

Taking apart each form of constitution separately, we should, on the basis of what has been stated, get a theoretical grasp on what happens to it.

192. 418 BC.
193. 413 BC.
194. In c. 580 BC. Further details at 1311a39–b1.
195. *Ath*. 32.3.

Democracies undergo change mostly because of the wanton behavior of popular leaders; for sometimes they bring malicious suits against owners of substantial private property, causing them to join forces (for a common fear brings together even the bitterest enemies), and sometimes publicly setting the multitude on them. One may see this sort of thing happening in many cases. In Cos the democracy was overthrown when wicked popular leaders arose (for the notables united [against them]). In Rhodes[196] too the popular leaders provided pay [to the people], preventing the naval officials from getting what they were owed, and so the latter, because of the suits brought against them, were then compelled to join together and overthrow the democracy. In Heraclea too, right after the colony was settled, the democracy was overthrown because of its popular leaders; for the notables were treated unjustly by them and went into exile, but later on the exiles grouped together, returned home, and overthrew the democracy. And the democracy in Megara[197] was overthrown in much the same way; for the popular leaders expelled many of the notables in order to have wealth to confiscate, until they made the exiles numerous. The exiles then returned, defeated the people in battle, and put in place an oligarchy. The same thing happened to the democracy in Cyme, which was overthrown by Thrasymachus. And **1305ᵃ1** if one got a theoretical grasp on them, one would see in the case of other cities as well that changes occur in pretty much this way. For popular leaders, in order to gratify the people, sometimes treat the notables unjustly, by redistributing their properties or their profits by means of public services, and cause them to join together, and sometimes they bring slanderous accusations in order to be able to confiscate the property of the rich.

In ancient times, whenever the same person was both a popular leader and a general, democracies changed to tyranny; for pretty much most ancient tyrants arose from popular leaders. The cause of this happening then but not now is that then popular leaders used to come from the ranks of those who held the office of general (for no one was as yet skilled at public speaking). Now, however, with the development of rhetoric, those who are capable public speakers become popular leaders. But because of their inexperience in military matters, they do not try to make an attack on anyone, although a few cases of this sort may have occurred somewhere.

Tyrannies also arose more frequently in former times than they do now because important offices were in the hands of certain individuals, as in Miletus, where a tyranny[198] arose out of the presidency, because the president had control of many important matters. Further, because cities were not large then and the people lived on their farms and were unleisured, being engaged in their works, so whenever the champions of the people became skilled warriors they attempted to impose a tyranny. They all did this after gaining the people's trust, and this trust was due to their hatred

196. 1302ᵇ23–24.
197. 1302ᵇ31.
198. Perhaps that of Thrasybulus.

of the rich. For example, in Athens Pisistratus[199] [was thought to deserve to be tyrant] because he engaged in faction against the plains-dwellers, and in Megara, Theagenes, because he slaughtered the rich men's cattle when he caught them grazing by the river. And Dionysius[200] was thought worthy of the tyranny for prosecuting Daphnaeus and the rich—because of his hostility, he was trusted as someone who believes in democracy.

Democracies also change from ancestral democracies into democracies of the most recent sort; for when officials are elected, but not on the basis of property assessments, and the people do the electing, those eager for office, by acting the part of popular leaders for them, bring matters to this point, that the people have control even over the laws. A remedy, so that this does not occur, or occurs less often, is to have the tribes, and not the people as a whole, nominate the officials.

Pretty much all the changes in democracies, then, happen due to these causes.

5.6
Political Change in Oligarchies

Oligarchies mostly undergo change in two ways that are most evident. One is when they treat the multitude unjustly; for in this situation anyone proves to be an adequate champion, especially when he comes from the oligarchy itself, like Lygdamis in Naxos, who actually became tyrant of the Naxians later on. As for faction that **1305b1** takes its starting-point from others, it also admits of differences. For sometimes the overthrow comes from the rich themselves, although not from the ones in office, when those enjoying the honors of office are altogether few. This occurred in Massalia, Istrus, Heraclea, and other cities; for those who did not share in office agitated until first elder brothers and later in turn the younger ones were admitted (for in some cities, a father and son, and in others, an elder and younger brother, may not hold office at the same time). And there in Massalia the oligarchy became more like a polity, while the one in Istrus ended in a democracy, and the one in Heraclea went from a small number to six hundred. In Cnidus too the oligarchy changed when the notables were engaged in faction among themselves because so few shared in office and because, as was stated, if a father shared, his son could not do so, nor, if there were several brothers, could any do so except the eldest; for while the notables were engaged in faction, the people seized the opportunity, picked one of the notables as their champion, attacked, and were victorious, for what is engaged in faction is weak. And in Erythrae in ancient times, during the oligarchy of the Basilids, even though those with control of the constitution supervised things well, the people nonetheless resented being ruled by a few and changed the constitution.

199. *Ath*. 13–14.
200. I.e., Dionysius I.

Oligarchies also undergo change from within themselves through the rivalry of those engaged in acting the part of popular leaders. This popular leadership is twofold. One exists among the oligarchs themselves; for a popular leader can arise even when they are very few. For example, among the Thirty in Athens Charicles and his followers became powerful by acting the part of popular leaders for the Thirty, and likewise in the time of the Four Hundred with Phrynichus[201] and his followers. [Or it may take place] when the oligarchs act the part of popular leaders for the mob. For example, in Larissa the civic guards acted the part of popular leaders for the mob because it elected them. And it is the same in all oligarchies where those who elect to office are not those from whom the officials are drawn, but offices are filled either from those with high property assessments or those who belong to certain political clubs, while the electors are either those who possess hoplite weapons or—precisely as happened in Abydus—the people. It also happens wherever juries are not drawn from the governing body—for by acting the part of popular leaders in order to influence judicial decisions, the oligarchs change the constitution, which is precisely what occurred in Heraclea on the Black Sea.[202] Further, it occurs when some draw the oligarchy into fewer hands; for those who want equality are compelled to bring in the people to assist them.

Changes in oligarchy also occur when some of the oligarchs spend away their private resources on loose living; for in fact such people seek to stir up change, and either aim at tyranny themselves or establish someone else as tyrant, as Hipparinus did for Dionysius in Syracuse. In Amphipolis, a man named Cleotimus brought in late-colonists from among the Chalcidians and, after they arrived, made them start factional conflict against the rich. In Aegina, the man who conducted the transaction with Chares tried to change the constitution due to this sort of cause. Sometimes such people try to make changes straightaway, while sometimes they steal public funds. In the latter case either they themselves or those who are opposed to their stealing engage in faction against the oligarchs, which is precisely what happened in Apollonia on the Black Sea.[203] An oligarchy that is in concord, however, is not prone to destruction from within itself. A sign of this is the constitution in Pharsalus; for though the oligarchs are few in number, they have control over many because they treat each other well.

Oligarchies are also overthrown when they produce another oligarchy within the oligarchy. This happens when, though the entire governing body consists of only a few people, not all of these few share in the most important offices, which is precisely what happened at one time in Elis; for though the constitution was in the hands of a few, altogether few of them became senators, because the senators, who numbered

201. *Ath*. 32.2.
202. 1304ᵇ31–34.
203. 1303ᵃ36–38.

only ninety, held permanent office, and because their election was characteristic of a dynasty and similar to the one regarding the senators in Sparta.[204]

Change in oligarchies occurs both in wartime and in peacetime. It occurs in wartime when the oligarchs are compelled, because of their distrust of the people, to employ mercenaries (for the man placed in command of them often becomes a tyrant, like Timophanes in Corinth). And if several men are placed in command, they often set up a dynasty for themselves. Sometimes fear of these consequences leads the oligarchs to give a share of the constitution to the multitude, because they are compelled to make use of the people. In peacetime, because of their distrust of each other, the oligarchs put the guarding of the city in the hands of mercenaries and a neutral official, who sometimes gains control of both sides. This is precisely what happened in Larissa at the time of the rule of Simus the Aleuad, and in Abydus at the time of the political clubs, one of which was that of Iphiades.

Factions also arise when some members of an oligarchy are rejected by others in connection with marriages and suits and are driven to engage in faction—for example, the cases mentioned previously in which marriage was the cause.[205] And Diagoras overthrew the oligarchy of the cavalrymen in Eretria because he was treated unjustly in connection with marriage. The factions in Heraclea and Thebes arose because of a judgment in court, when Eurytion (in Heraclea)[206] and Archias (in Thebes) were justly but factiously punished for adultery by the courts; for their enemies loved
1306b1 rivalry to the point that they had them bound in the pillory in the marketplace.[207]

Many have also been overthrown by those in the constitution who became disgusted because the oligarchies were too much like the rule of a master, like the one in Cnidus and the one in Chios.[208]

But changes also occur because of mischance both in so-called polities and in oligarchies, where eligibility for the council, the courts, and the other offices is based on a property assessment. For often the first assessment is set to suit existing circumstances, so that only a few will share in the oligarchy and only those in the middle class in the polity. But when peace or some other sort of good luck leads to prosperity, properties come to be assessed at many times their original value, so that all the citizens share in all the offices. Sometimes the change occurs gradually, little by little, and is unnoticed, while sometimes it happens more quickly.

Oligarchies change and engage in faction, then, due to these sorts of causes. In general, both democracies and oligarchies sometimes change not into the opposing constitutions but into others of the same kind—for example, from democracies and oligarchies based on law into those with [complete] control, and vice versa.

204. 1270b35–1271a6.
205. 1303b37–1304a17.
206. 1304b31–34.
207. A punishment commonly reserved for thieves.
208. 1305b12–18, 1303a34–35.

5.7
Political Change in Aristocracies

In aristocracies factions arise in some cases because few people share in the honors [of office], which is precisely what was said to change oligarchies as well, because aristocracy too is in a way oligarchy (for the rulers are few in both, although not because of the same thing). At any rate, that is why an aristocracy too is thought to be an oligarchy. This necessarily happens above all when there is a group of people who presume themselves equal in virtue to the ruling few—for example, the so-called Sons of the Maidens at Sparta (for they were descended from the Equals), who, when discovered in a conspiracy, were sent off to colonize Tarentum. Or it happens when powerful men, who are inferior to no one in virtue, are dishonored by others who are held in greater honor, as Lysander was by the kings. Or it happens when someone of manly courage does not share in office, like Cinadon, who instigated the rebellion against the Spartiates in the reign of Agesilaus.[209] Or, again, factions arise when some people are very poor and others very rich, as happens especially in wartime. This also happened in Sparta at the time of the Messenian War[210] (this is clear from the poem of Tyrtaeus called "Good Legislative Order"[211]); for those who were hard-pressed because of the war demanded a redistribution of the land. Or, again, when there is **1307[a]1** a powerful man capable of becoming yet more powerful, who engages in faction in order to become sole ruler—just as Pausanias (who was general during the Persian Wars) seems to have done in Sparta, and Hanno in Carthage.

Polities and aristocracies are mostly overthrown, however, because of a deviation from what is just within the constitution itself. For the starting-point of overthrow in a polity is that democracy and oligarchy are not mixed well, and in an aristocracy, of these two and virtue as well, but especially of the two. I mean by "the two," democracy and oligarchy. For it is these that polities and most so-called aristocracies try to mix. For aristocracies differ from what are called "polities" in this respect, and that is why the former of them are less and the latter more stable; for those constitutions that lean more toward oligarchy get called "aristocracies," while those that lean more toward democracy get called "polities." That is why, indeed, the latter sort are more secure than the former; for the majority are the stronger party and are more content with an equal share, while if those living in riches are granted superiority by the constitution, they try to be wantonly aggressive and get more for themselves.

In general, whichever direction a constitution leans toward is the direction in which it changes when either party grows in power—for example, polity into democracy and aristocracy into oligarchy. Or they are changed into their contraries—for example, aristocracy into democracy (for the poorer people, on the supposition that

209. I.e., Agesilaus II.
210. I.e., the Second Messenian War (685–668 BC).
211. Frs. 7–9 Diehl.

they are being unjustly treated, pull it around to its contrary), and polity into oligarchy (for what is alone steadfast is equality in accord with worth and the having of what is one's own). The change mentioned occurred at Thurii. For, because the property assessment for holding office was rather high, a shift was made to a smaller one and to a larger number of offices. But because the notables illegally acquired all the land (for the constitution was still too oligarchic, and they were able to get more as a result). {. . .}[212] But the people, who had received military training during the war, became stronger than the garrison troops, until those who had more of the land [illegally] gave it up.

Further, because all aristocratic constitutions are oligarchic in character, the notables in them especially tend to get more—for example, even in Sparta properties keep passing into fewer and fewer hands. Also, the notables are allowed to do as they please and make marriage alliances with whomever they please. That is why indeed the city of the Locrians was destroyed, because of a marriage alliance with the tyrant Dionysius, something that would not have occurred in a democracy, nor in a well-mixed aristocracy.

Most of all, however, aristocracies are apt to change unnoticed by being overturned little by little, which is precisely what was said previously[213] about all constitutions universally, that even a small difference may cause them to change; for once one thing relating to the constitution is abandoned, after this people can more easily change something that is in a small degree larger, until they change the entire order. This also happened in the case of the constitution of Thurii. For the law allowed the same man to be general only after a five-year interval. But when some of the young men showed military ability and were held in high repute by the multitude of garrison troops, they came to have contempt for the men who were in charge of affairs, and thought that they themselves could easily prevail. Hence they first undertook to abrogate this law, so as to make it possible for the same men to serve as generals continuously, since they saw that the people would vote for them with enthusiasm. The officials in charge of such matters, the so-called councilors, were at first inclined to oppose this. But they let themselves be persuaded, because they thought that once this law was changed, the rest of the constitution would be left intact. Later, however, when they wished to prevent other things from being changed, they were no longer able to do anything more, but the entire order characteristic of the constitution was changed into a dynasty ruled by those men who had begun the process of stirring up change.

All constitutions are subject to change (sometimes from within, sometimes from outside), however, when there is a contrary constitution either nearby or far away but powerful. This is precisely what happened in the time of the Athenian and Spartan empires; for everywhere the Athenians overthrew oligarchies, the Spartans democracies.

212. Some editors mark a lacuna in the text at this point.
213. 1303a20–25.

Where changes and factions in constitutions come from, then, has been pretty much stated.

5.8
How to Preserve Constitutions (1)

We have next to speak about the preservation of constitutions, both in general and about each separately. It is clear, in the first place, that if indeed we know what things destroy a constitution, we also know what things preserve it; for contraries are productive of contrary things, and destruction is contrary to preservation. In well-mixed constitutions, then, just as care should above all be taken to ensure that no one breaks the law in other ways, small [violations] should be especially guarded against; for illegality creeps in unnoticed, in just the way that property gets used up by frequent small expenditures. The expense goes unnoticed because it does not occur all at once; for thought is led to reason fallaciously by them, as in the sophistical argument, "If each is small, so too are all." In one way this is true; in another false; for the whole and the totality of parts is not small, but it is composed of small parts. One thing to guard against, then, is destruction that has a starting-point of this sort.

Next, one must not put one's trust in the subtle devices put together for the sake of deceiving the multitude, for they are refuted by the facts (which sort of subtle constitutional devices we mean was stated previously).[214]

Next, one should notice that not only some aristocracies but also some oligarchies survive, not because their constitutions are secure, but because those in office treat well both those outside the constitution and those in the governing body. They treat well those who do not share in the constitution by not being unjust toward them, and by bringing their leading men into it. And they treat well those who love honor by not being unjust to them in terms of dishonor, or to the many in terms of profit. As for themselves, the ones who do share—they treat each other in a democratic manner. For what democrats seek to extend to the multitude—equality—is not only just but also advantageous for those who are similar. That is why, if the governing body is large, many democratic legislative measures prove advantageous—for example, having offices be tenable for six months, in order that all those who are similar may share in them; for those who are similar are already a sort of people, which is why popular leaders often arise even among them, as was said previously.[215] Further, [with such legislative measures] oligarchies and aristocracies are less likely to fall into dynasties; for officials who rule for a short time cannot so easily do evil as those who rule for a long time, since this is what causes tyrannies to arise in oligarchies and democracies; for either the most important men in the two constitutions aim at tyranny (popular

214. $1297^{a}14$–$^{b}1$.
215. $1305^{b}24$–27.

leaders in democracies, dynasts in oligarchies), or those who hold the most important offices do so, when they hold them for a long time.

Constitutions are preserved not only because of being far away from the factors that destroy them, but sometimes even by being nearby; for fear makes people keep a firmer grip on the constitution. So those who are concerned about their constitution should manufacture fears—so that the citizens defend the constitution, and, like sentries on night duty, never relax their guard—and make what is faraway seem close at hand.

Further, one should try also to guard against the rivalries and factions of the notables, both by means of the laws as well as to prevent those who are not involved in the rivalry from getting caught up in it themselves, since to recognize an evil right from the start of its emerging takes no random person, but rather a man of politics.

As regards change from an oligarchy or a polity because of property assessments, if it occurs while the assessments remain the same but money becomes more plentiful, it is advantageous to investigate the total communal assessment in comparison with that of the past—in those cities with an annual assessment with that of last year's, in larger cities with that of three or five years ago. **1308b1** If the total is many times greater or many times less than it was when the rates qualifying someone to share in the constitution were put in place, it is advantageous to have a law that tightens or loosens the assessment—tightening it in proportion to the increase if the total has excessively increased, loosening it or making it less if the total has decreased. For when oligarchies and polities do not do this, the result is that, if the total has decreased, an oligarchy arises from the latter and a dynasty from the former, and, if it has increased, a democracy arises from a polity and either a polity or a democracy from an oligarchy.

It is something common in democracy, oligarchy, monarchy, and every constitution not to allow anyone to grow too great or out of all due proportion, but to try to give small honors over a long period of time rather than large ones quickly (for people are corrupted by major honors, and not every man can handle good luck). Failing that, constitutions should at least try not to take away all at once honors that have been awarded all at once, but to do so gradually. Also, they should above all try to regulate matters by means of the laws, so as to ensure that no one arises who is greatly superior in power of friends or wealth. Failing this, they should make their banishments be banishments to foreign parts.

But since people also attempt to stir up change because of their private lives, an office should be set up to keep an eye on those whose ways of living are disadvantageous to the constitution, whether to the democracy in a democracy, to the oligarchy in an oligarchy, or similarly for each of the other constitutions.

Due to the same causes one must also guard against the city's flourishing only in regard to one of its parts. A remedy for this is always to place actions and offices in the hands of opposing parts—I mean that the decent are opposite to the multitude, and the poor to the rich. Another remedy is to try to mix together the multitude of

the poor and that of the rich or to increase the middle class (for this dissolves factions caused by inequality).

But the most important thing in every constitution is for it to have the laws and the management of other matters ordered in such a way that it is not possible for the offices to make a profit. One should pay particular heed to this in oligarchies. For the many do not so much resent being excluded from office, and are even glad to be given the leisure to attend to their private affairs, but they do resent it when they think that officials are stealing public funds. At any rate, they are then pained both at not sharing in office and at not sharing in the profits. Indeed, the only way it is possible for democracy and aristocracy to co-exist is if someone were to establish this [law and management]. For it would then be possible for both the notables and the multitude to have what they wish for. For allowing everyone **1309a1** to hold office is democratic, but having the notables actually be in the offices is aristocratic. And this is what will happen on the condition that it is impossible to profit from office; for the poor will not want to hold office, because there is no profit in it, but will prefer to attend to their private affairs, while the rich will be able to hold it, because they need no additional support from public funds. The result will be that the poor will become rich through spending their time on their works, while the notables will not be ruled by random people. To prevent public funds being stolen, then, the handing over of the money should take place in the presence of all the citizens, and copies of the accounts should be deposited with each clan, company, and tribe. And to ensure that people will hold office without seeking profit there should be a law that assigns honors to officials who are well reputed.

In democracies, the rich should be treated with restraint—not only by not having their property redistributed, but by not having their profits redistributed either (as happens unnoticed in some constitutions). It is also better to prevent the rich, even if they wish to do so, from taking on expensive but useless public services, such as paying for choruses, for superintendence at torch races, and other things of the same sort.

In an oligarchy, on the other hand, one should take great care of the poor, and distribute the offices to them that yield some gain. And if one of the rich treats them with wanton aggression, his punishment should be greater than if he does this to his own lot. Also, inheritances should not be passed in accord with a bequest but in accord with family, and the same person should not receive more than one inheritance. In this way, property holdings would be more equitable, and more of the poor could join the ranks of the rich. It is advantageous, both in democracy and in oligarchy, to give either equality or precedence in all other matters to those who share least in the constitution—the rich in a democracy and the poor in an oligarchy. But the offices that have control of the constitution should be kept solely or largely in the hands of those who are from the constitution.

5.9
How to Preserve Constitutions (2)

Those who are to hold the controlling offices must possess three qualities: first, friendship toward the constitution that is in place; next, great capacity for the works of the office; third, virtue and justice of the sort that in each constitution is with a view to the constitution (for if what is just is not the same in all constitutions, there must be differences in justice as well).

But there is a puzzle, when all these qualities are not found in the same person, about how the choice is to be made—for example, if one man knows generalship but is wicked and no friend to the constitution, while another is just and friendly to it, how should the choice be made? It seems that one should look to two things: which of these qualities does everyone share in more and which less? That is why, in the case of the office of general, one should look to experience more than to virtue (for everyone shares in generalship less, but in decency more). In the case of guardianship or stewardship, on the other hand, the contrary holds (for these require more virtue than most possess, while the scientific knowledge they require is common to all).

One might raise this puzzle: If someone has the capacity for office as well as friendship toward the constitution, why does he need virtue? For even the first two will produce what is advantageous. Or is it possible for someone who possesses these two qualities to lack self-control, so that just as these people fail to serve their own interests well, even though they have the knowledge and are friendly to themselves, so nothing prevents them from being the same way in the case of the community?

Simply speaking, whatever features in laws we say are advantageous to constitutions all preserve those constitutions, as does the most important element, often mentioned,[216] of keeping watch that the multitude wishing for the constitution is stronger than the one that does not wish for it.

In addition to all these features, one thing must not be overlooked, which is in fact overlooked by the deviant constitutions, the mean; for many of the features that are believed to be democratic destroy democracies, and many that are believed to be oligarchic destroy oligarchies. Those who think that this[217] is the one and only virtue pull the constitution toward the extreme. They are ignorant of the fact that just as a nose that deviates from the most noble straightness toward being hooked or snub can nonetheless still be noble and please the eye, if it is tightened still more toward the extreme, the part will first be thrown out of due proportion, and in the end will appear not to be a nose at all, because it has too much of one and too little of the other of these contraries, and it is the same way with the other parts [of the body] as well. This, then, can also happen in the case of the constitutions. For it is also possible for an oligarchy or a democracy to be adequate even though it has diverged from the

216. It is actually mentioned only once, at 1296b14–16.

217. I.e., virtue as conceived by democracy, on the one hand, and by oligarchy, on the other.

best order. But if someone tightens either of them more, he will first make the constitution worse, and in the end make it not a constitution at all. That is why legislators and politicians should not be ignorant about which democratic features preserve a democracy and which destroy it, or which oligarchic features preserve or destroy an oligarchy. For neither of these constitutions can exist and endure without rich people and the multitude, but when a leveling of property occurs, the resulting constitution is necessarily of a different sort, so that by destroying these by laws carried to excess, they destroy their constitutions. **1310ᵃ1**

An error is made in both democracies and oligarchies. In democracies popular leaders err wherever the multitude have control of the laws (for they always divide the city in two by fighting with the rich, yet they should do the contrary, and always be regarded as spokesmen for the rich). In oligarchies, the oligarchs should be regarded as spokesmen for the people, and should take oaths that are the contrary of the ones they take now; for in some oligarchies, they now swear, "and I will be hostile to the people and will plan whatever wrongs I can against them," while they should hold and act the part of holding the contrary view, and declare in their oaths, "I will not wrong the people."

But the most important of all the ways that have been mentioned for making a constitution endure, which as things stand everyone neglects, is for citizens to be educated in a way that looks to their constitutions. For the most beneficial laws, even when ratified by all who are engaged in politics, are of no benefit if people are not habituated and educated in the constitution—democratically if the laws are democratic and oligarchically if they are oligarchic. For if indeed lack of self-control exists at the level of a single individual, it also exists at the level of a city.

But to have been educated in a way that looks to the constitution does not mean this: doing whatever pleases the oligarchs or those who wish for a democracy. Rather, it means doing the things that will enable the former to govern oligarchically and the latter to govern themselves democratically. In present-day oligarchies, however, the sons of the rulers live in luxury, while the sons of the poor are hardened by exercise and toil, so that they are more inclined to stir up change and better able to do so. In those democracies, on the other hand, that are held to be especially democratic, the very contrary of what is advantageous has been put in place. The cause of this is that they define freedom incorrectly. For there are two things by which democracy is believed to be defined, by the majority being in control and by freedom; for the just is believed to consist in equality, and what the multitude believes to be equal is believed to be in control, and freedom is believed to be doing whatever one wishes. So in democracies of this sort everyone lives as he wishes, and "for what he craves," as Euripides says.[218] This is base; for living with a view to the constitution should be considered not slavery but preservation.

218. Fr. 891 Nauck.

The sources of change and destruction in constitutions, then, and the features because of which they are preserved and endure, are simply speaking just about this many.

5.10
Changing and Preserving Monarchies

It remains also to go through monarchy, both the sources of its destruction and
40 the features because of which it is naturally preserved. What happens in the case of kingships and tyrannies is pretty much the same as what was said to happen in the
1310b1 constitutions [mentioned]. For kingship is in accord with aristocracy, and tyranny is a combination of the last-most oligarchy and the last-most democracy. That is why, indeed, tyranny is also the most harmful to those it rules, inasmuch as it is composed
5 of two evils and involves the deviations and errors of both these constitutions.

The coming to be of each of these sorts of monarchy lies from the start in contrary sources; for kingship arose to provide help for the decent against the people, and a
10 king is appointed from among the decent men on the basis of a superiority in virtue, or in the actions that spring from virtue, or in accord with a superiority in a family of this sort. A tyrant, on the other hand, is appointed from the people (that is to say, the multitude) to oppose the notables, so that the people may suffer no injustice from them. This is evident from what has happened. For pretty much (one might
15 almost say) all tyrants have come into being from popular leaders, who came to be trusted by slandering the notables. For some tyrannies were put in place in this way in cities that had already grown large, while other earlier ones arose from kings who deviated from ancestral customs and sought to rule more as a master does. Others
20 were put in place by people elected to the offices that have supreme control (for in ancient times, the people appointed "doers of the people's business" and "sacred ambassadors"[219] to serve for long periods of time). Still others arose in oligarchies that gave a single elected official control of the most important offices. For in all these ways it was easy for such people to prevail, if only they wished, because of the power
25 they already possessed through the kingship or through other offices of honor. Thus Pheidon of Argos and others became tyrants while there was already a kingship; the Ionian tyrants and Phalaris as a result of their high office; and Panaetius in Leontini,
30 Cypselus in Corinth, Pisistratus in Athens, Dionysius in Syracuse, and likewise others, from popular leadership.

As we said,[220] then, kingship is an order that is in accord with aristocracy. For it is in accord with worth, whether this is individual virtue or that of family, or in accord with benefactions, or these together with capacity. For all those who obtained

219. Sent to attend sacred games and to consult oracles on behalf of their city.
220. 1310b2–3.

this office either had benefited, or had the capacity to benefit, their cities or nations. Some, like Codrus, saved their people from enslavement in war; others, like Cyrus, set them free; others settled or acquired territory, like the kings of the Spartans, Macedonians, and Molossians.

A king wishes to be a guardian, in order that property owners suffer no injustice and the people no wanton aggression. But tyranny, as has often been said, looks to no **1311ᵃ1** common [advantage] except for the sake of private benefit. And the aim characteristic of tyranny is the pleasant, while the aim characteristic of kingship is the noble. That is also why it is characteristic of a tyrant to want to get more wealth, and of a king to get more of the things pertaining to honor. Also, a king's bodyguard consists of citizens, while a tyrant's consists of foreigners.

It is evident, then, that tyranny has the evils both of democracy and of oligarchy. From oligarchy comes its taking wealth to be its end (for, in fact, only in this way can the tyrant possibly maintain his bodyguard and his luxury), and its mistrust of the multitude. That is why, in fact, tyrants deprive them of weapons, and why mistreating the mob, driving them out of the city proper, and dispersing them is common to both constitutions, to oligarchy as well as to tyranny. From democracy on the other hand comes its making war on the notables, its destroying them by both covert and overt means, and its exiling of them as rivals in the craft [of ruling] and impediments to its rule. For it is from the notables that conspiracies arise, since some of them wish themselves to rule, and others not to be enslaved. Hence too the advice that Periander gave to Thrasybulus when he cut down the tallest ears of wheat, that it is always necessary to do away with the citizens who exhibit a superiority.[221]

As has pretty much been said, then, one should consider the starting-points of change both in the constitutions [mentioned] and in monarchies to be the same; for it is because of injustice, because of fear, and because of contempt that many of those who are ruled attack monarchies—in the case of injustice, it is mostly because of wanton aggression, but sometimes too because of the deprivation of private property. The ends sought are also the same there as in tyrannies and kingships; for monarchs possess greatness in wealth and in honors of office, which everyone desires.

Some attacks are directed against the body of the rulers, others against the office. Those caused by wanton aggression are directed against the body. And though wanton aggression is of many sorts, each of them is a cause of anger; and most angry people attack for the sake of revenge, not for the sake of attaining superiority. For example, the attack on the Pisistratids took place because they abused Harmodius' sister and showed contempt for Harmodius himself (for Harmodius attacked because of his sister, and Aristogeiton because of Harmodius). People plotted against Periander, tyrant of Ambracia, because once while drinking with his boyfriend, Periander asked whether he was pregnant by him yet. Philip was attacked by Pausanias because **1311ᵇ1** he allowed him to be treated with wanton aggression by Attalus and his coterie.

221. 1284ᵃ26–33.

Amyntas the Little was attacked by Derdas because he boasted of having deflowered him. The same is true of the attack on Evagoras of Cyprus by a eunuch; he felt he was treated with wanton aggression because Evagoras' son had taken away his wife and killed the king.

Many attacks have also occurred because of the shameful treatment of the bodies of others by certain monarchs. The attack on Archelaus [II] by Crataeas is an example; for Crataeas always felt burdened by the sexual favors [he required], so that even a lesser pretext would have been enough, or perhaps he did it because Archelaus did not give him one of his daughters in marriage, though he had agreed to do so. (Instead, when hard-pressed in the war against Sirras and Arrabaeus, he gave his elder daughter to the king of Elimeia and the younger one to his own son Amyntas, thinking that this would be likely to prevent Amyntas from quarreling with his son by Cleopatra.) In any case, the starting-point of Crataeas' estrangement was that he felt burdened by his sexual intercourse with Archelaus. And Hellanocrates of Larissa joined him in the attack for the same reason. For because Archelaus deflowered him and then persistently refused to return him to his home as promised, he thought that the king's intercourse with him was due to wanton aggression rather than to sexual appetite. Python and Heracleides of Aenus, on the other hand, killed Cotys to avenge their father, while Adamas revolted on the grounds of wanton aggression, because he had been castrated by Cotys when he was a boy.

Many people too, angered because their bodies have been tormented by blows, have killed or tried to kill, on the grounds of being treated with wanton aggression, even those who held office or were associated with kingly dynasties. For example, when the Penthilids of Mytilene went around beating people with clubs, Megacles and his friends attacked and killed them.[222] Later, Smerdes killed Penthilus because he had beaten him and dragged him away from his wife. Decamnichus became leader of the revolt against Archelaus,[223] being the first to incite his adversaries—the cause of his anger was that Archelaus had handed him over to the poet Euripides for flogging (Euripides was enraged by a remark made about his bad breath). Many others have been killed or plotted against due to causes such as these.

Similar attacks also occur because of fear; for this, as we saw,[224] is a cause of change in monarchies and constitutions too. For example, Artapanes killed Xerxes, fearing a charge in connection with the murder of Darius, because he hanged him without being ordered to do so by Xerxes, thinking that Xerxes, not remembering on account of his dining, would pardon him.

Other attacks are because of contempt, as when someone saw Sardanapalus carding wool with the women, if what the storytellers say is true (though if this is not true of him, it might well be true of someone else). And Dion attacked Dionysius

222. Sometime before 650 BC.
223. In 399 BC.
224. 1311a25.

the Younger because of contempt, when he saw that the citizens shared his feelings, and that Dionysius himself was always drunk.[225] Even some friends make an attack because of contempt; for because they are trusted, they feel contempt, thinking that they will not be discovered. And those who think they have the power to take over the rule attack because of contempt in a way; for because of their power, and the contempt for danger that their power gives them, they readily make their attempt. Thus generals attack monarchs. For example, Cyrus attacked Astyages because of contempt both for his mode of life and for his power, because his power had declined and, as for himself, he was living in luxury. And Seuthes the Thracian attacked Amadocus while he was his general.

Others attack monarchs from several of these motives—for example, both because of contempt and because of profit—as Mithridates attacked Ariobarzanes. {Attempts of this sort are made mostly by those of a bold nature, who are assigned to military office by monarchs; courage possessed of power is boldness. And it is because of both of these that people attack, thinking that they will easily prevail.}[226]

With those who attack because of love of honor, however, the cause operates in another way that is beyond those previously discussed. For, although some attack tyrants because they see great profit and high office in store for themselves, this is not why someone whose attack is motivated by love of honor deliberately chooses to take the risk. It is rather that, while the former attack due to the causes mentioned, the latter, just as they would undertake any other extraordinary action through which people become famous and notable in the eyes of others, in the same way attack monarchs because they wish to gain not a monarchy but a reputation. But then those who are impelled by this sort of cause are, to be sure, very few in number; for it presupposes giving no thought to their own preservation should the action not succeed. They must follow, then, the supposition of Dion, which is not easy for most people to do; for accompanied by a few followers he marched against Dionysius, saying that whatever point he was able to reach, he would be satisfied to have shared that much in the action, and that if, for example, he were killed just after having set foot on land, that death would be a noble one for him.

One way that a tyranny is destroyed, just as each of the other constitutions is as well, is from the outside, if there happens to be a stronger constitution contrary to it (for the wish to destroy a tyranny will clearly be present, because of the contrariety between the deliberate choices of the two constitutions, and because all people do what they wish when they have the power). The constitutions that are contrary—in the way "potter is to potter," as Hesiod says[227]—are democracy (for the ultimate democracy is in fact a tyranny) and kingship or aristocracy, because of the contrariety between these constitutions. That is why the Spartans overthrew a large number of

225. The story is continued at 1312^{a}33–39.

226. This sentence should perhaps follow the word "drunk" at 1312^{a}6.

227. *Works and Days* 25.

tyrannies,[228] as did the Syracusans during the time when they were governed in a good way.[229]

Another way a tyranny is destroyed is from within itself, when those sharing in it engage in faction, as happened in the tyranny of those around Gelon and, in our own time, in the tyranny of those around Dionysius. The tyranny of Gelon was destroyed when Thrasybulus, the brother of Hiero, acting the part of popular leader for Gelon's son, impelled him toward pleasures, in order that he himself might rule. The family joined together to destroy not the entire tyranny, but Thrasybulus. But those who joined with them seized the opportunity and expelled all of them. Dion, who was related by marriage to Dionysius, marched against him, won over the people, and expelled him, but was himself killed afterward.

There are two causes due to which people mostly attack tyrannies, hatred and contempt. But though one of these—hatred—always attaches to tyrants, it is from contempt that many of their overthrows come about. A sign of this is that (one might almost say) most of those who won the office of tyrant held on to it, while all their successors lose it straightaway. For living lives of indulgence, they readily became contemptible and gave others ample opportunity to attack them. And anger should also be taken as a part of hatred; for in a way it gives rise to the same sorts of actions. Often, in fact, it is more conducive to action than hatred, for angry people attack more vehemently because feeling does not make use of rational calculation. It happens that people are particularly led by their spirited feelings because of wanton aggression—which was the cause of the overthrow of the tyranny of the Pisistratids as well as of many others. But hatred employs rational calculation more than anger does; for anger involves pain, so that it is not easy to rationally calculate, while hatred does not involve pain.

To speak summarily, the causes that we said destroy unmixed or ultimate oligarchies and ultimate democracies must also be counted as destroying tyranny; for these in fact are divided tyrannies.

Kingship is destroyed least by outside factors, which is also why it is long-lasting. The sources of its destruction in most cases come from within itself. It is destroyed in two ways: in one, when those who share in the kingship engage in faction, and
1313a1 in another way when the kings try to manage affairs in a more tyrannical fashion, claiming that they deserve to have control in too many areas and contrary to the law. Kingships no longer arise now, but if any do happen to occur, they tend more to be tyrannical monarchies. This is because kingship is rule with the voluntary consent of the ruled and has control of more important matters. But now there are numerous men of equal quality and none so superior as to measure up to the magnitude and worth of the office of king. So because of this people do not voluntarily put up with

228. Including, among many others, one in Athens.
229. I.e., while they had an aristocracy (466–413 BC).

this sort of rule. And if someone comes to rule through force or deceit, this already seems to be tyranny.

In the case of hereditary kingships, there is something besides the factors already mentioned that should be held to be a cause of their destruction, that many hereditary kings easily become objects of contempt and (even though they do not possess tyrannical power but honorable kingly office) commit wanton aggression. For their overthrow was easy. For when the ones ruled do not wish it there will straightaway not be a king, but there will be a tyrant, even when they do not wish it.

Monarchies are destroyed, then, due to these and other such causes.

5.11
Preserving Kingships and Tyrannies

It is clear that monarchies are, simply speaking, preserved by the contrary causes, and kingships in particular by drawing them toward greater moderation. For the fewer areas over which kings have control, the longer must their whole office endure; for they themselves become less like masters, more equal in their characters, and less envied by those they rule. That is why, in fact, the kingship of the Molossians lasted a long time, and that of the Spartans as well. In the latter case it was because the office was divided into two parts from the start, and again because Theopompus, besides moderating it in other ways, in addition put in place the office of the overseers. By diminishing the power of the kingship he increased it in terms of duration, so that in a way he made it greater, not lesser. Just this, in fact, is precisely what they say he replied to his wife when she asked him whether he was not ashamed to hand over a lesser kingship to his sons than the one he had inherited from his father: "Certainly not," he said, "for I am handing over one that will be longer lasting."

Tyrannies are preserved in two entirely contrary ways. One of them is traditional and is the way most tyrants exercise their rule. Many of these are said to have been established by Periander of Corinth, but many of this sort may also be seen in the Persian way of ruling. These include both the one mentioned some time ago[230] as tending to preserve tyranny (to the extent that it can be), cutting down the superior men and doing away with the self-confident ones. Also, not allowing communal messes, political clubs, education, and other things of that sort. Guarding against **1313b1** everything that tends to engender two things, self-confidence and mutual trust. Not allowing places of leisure and other leisurely gatherings, and doing everything to ensure that all people are as ignorant of each other as possible (for knowledge tends to produce mutual trust). Also, requiring those residing in the city to be always in [public] view and to pass their time at the palace gates (for that way the actions they do will be hard to keep secret and they will be habituated to think humble thoughts

230. 1284a26–33, 1311a8–22.

by always doing slavish service). Also, imposing all the other restrictions of a similar nature that are found in Persian and barbarian tyrannies (for they are all capable of producing the same effect).

Another is trying to let nothing done or said by any of his subjects escape notice, but to retain spies, like the so-called women informers of Syracuse, or the eavesdroppers that Hiero sent to every meeting or gathering (for people speak less freely when they fear the presence of such spies, and if they do speak freely, they are less likely to go unnoticed). Another is to slander people to each other, setting friends against friends, the people against the notables, and the rich against the rich themselves.

It is also tyrannical to impoverish the ruled, so that they cannot afford a militia and[231] are so occupied with doing their daily work that they lack the leisure for plotting. The pyramids of Egypt, the Cypselid monuments, the construction of the temple of Olympian Zeus by the Pisistratids, and the works on Samos commissioned by Polycrates are all examples of this (for all these things can produce the same result, lack of leisure and poverty for the ruled). And there is taxation, as in Syracuse, when, during the reign of Dionysius, taxation ate up a person's entire estate in five years. A tyrant also engages in warmongering in order that his subjects will lack leisure and keep being in need of a leader. And while a kingship is preserved by its friends, it is a mark of a tyrant to distrust his friends most of all, on the supposition that while all his subjects wish [to overthrow him], these are above all capable of doing so.

And the things that occur in the ultimate democracy are all characteristic of a tyranny, the dominance of women in matters concerning the household, in order that they may report on the men, and the license of slaves due to the same cause; for slaves and women not only do not plot against tyrants but, if they prosper under them, are necessarily well-disposed toward tyrannies and toward democracies as well; for the people too wish to be a monarch. That is why a flatterer is honored in both constitutions—in democracies, the popular leader (for the popular leader is a flatterer of the people), in tyrannies, those who are obsequious in their dealings with the tyrant, which is precisely the work of flattery. And in fact it is because of this that tyranny is a lover of wickedness. For tyrants in fact delight in being flattered. But no one would do this who had free thoughts. On the contrary, decent people show friendship, or [at least] do nor flatter. Also, the wicked are useful for wicked things, for "nail is driven out by nail," as the proverb goes. Also, it is characteristic of a tyrant not to delight in anyone who is dignified or free (for a tyrant thinks that he alone deserves to be like that, while anyone who is a rival in dignity or in being free deprives tyranny of its superiority and its element of mastership, and so tyrants hate him as a threat to the rule). Also, it is characteristic of a tyrant to have foreigners rather than citizens as dinner guests and companions, on the supposition that the latter are hostile to him, while the former do nothing to oppose him.

231. Reading μήτε.

These and similar things are characteristic of tyranny and preserve its rule, but there is no depravity that it leaves out. And (one might almost say) all of these fall into three forms. For tyranny aims at three things. The first is for the ruled to think small (for a small-souled person would plot against no one). The second is for them to distrust each other (for a tyranny will not be overthrown until some people trust each other). That is also why tyrants make war on decent people, on the supposition that they are harmful to their rule, not only because they refuse as something unworthy to be ruled as by a master, but also because they are trusted both among themselves and among others, and do not inform on each other or on anyone else. The third aim is incapacity to take any actions (for no one tries to do what is impossible, and so no one tries to overthrow a tyranny if he lacks the power). The defining marks of tyranny, then, to which the wishes of tyrants may be led back, are these three; for a person might lead all the things characteristic of tyranny back to these three hypotheses: that its subjects not trust each other, that they have no power, and that they think small.

This, then, is one way in which the preservation of tyrannies comes about. The other involves precautions that are pretty much the contrary of those just discussed. And one may grasp it by considering the destruction of kingships. For just as one way to destroy a kingship is to make its rule more tyrannical, so one way to preserve a tyranny is to make it more like a kingship, provided that one thing only is safeguarded, power, so that the tyrant can rule not only subjects who wish it but also ones who do not wish it. For if he gives this up too, he also gives up being a tyrant. But while this must remain as a hypothesis, as regards the other things, he should do some and seem to do others, acting the part of a king in a noble manner.

First, then, he should seem to take thought for public funds. He should not squander them on gifts that enrage the multitude, as when they take from people who are laboring and toiling in penury, and spend lavishly on courtesans, foreigners, and artists. He should also render an account of funds received and expended, which is precisely what some tyrants in the past have done (for in this way, he will give the impression of managing the city like a household manager, not like a tyrant). And he should not be afraid of running short of funds, since he has control of the city. But—at any rate, for those tyrants who are often away on foreign campaigns—it is more advantageous to follow this policy than to amass a great hoard of wealth and leave it behind; for those who guard the city will be less likely to attack his interests. Tyrants on a foreign campaign have more to fear from such guards, indeed, than from the citizens; for the citizens accompany him, while the guards stay behind. Next, it should appear that taxes and public services are for the purposes of administration, and, should he need them, for use in times of war, and, in general, a tyrant should present himself as a guardian and treasurer of the public funds, not of his own private ones.

Also, he should appear not harsh but dignified, and further, of such sort that those who meet him feel not fear, but rather awe. But this is not easily achieved if

he is contemptible. That is why, even if a tyrant neglects the other virtues, he must cultivate military virtue and make himself a reputation for it.

Further, not only should he himself avoid being seen behaving with wanton aggression toward any of those he rules, whether boys or girls, but neither should any of those around him. Likewise, the women of his household should also be respectful toward other women, as many tyrannies have also been destroyed because of the wanton aggression of women. As regards indulgence in bodily pleasures, he should do the contrary of what certain tyrants do now (for they not only do this as soon as it is dawn, and continue for many days, but they also wish to be seen doing so by others, in order that they may be admired as happy and blessed). Yet above all in such things a tyrant should be moderate, or, failing that, he should at least avoid exhibiting his indulgence to others (for it is not the sober man who is readily attacked or despised, but the drunk one, and not the one who is wide awake, but the one who is drowsy).

Indeed, a tyrant must do the contrary of pretty much all the things mentioned before[232] (for he must establish and adorn the city as if he were a steward, not a tyrant).

Further, a tyrant should always be seen to be outstandingly serious about matters concerning the gods (for people are less afraid of suffering something contrary to the law at the hands of such people, and if they think their ruler is a god-fearing man, and one who takes thought of the gods, they plot against him less, on the supposition that he has even the gods on his side). In appearing to be someone of this sort, however, the tyrant must avoid silliness.

A tyrant should so honor those who prove to be good in any area that they would never expect to be more honored by citizens living under their own laws. And he should bestow such honors himself, but punishments should be left to other officials and to the courts.

It is a precaution common to every sort of monarchy, however, not to make any one person great, but if indeed one, then several (for they will keep an eye on each other). And if it happens to be necessary to make one person great, at least it should not be someone of bold character (for someone with such a character is most ready to attack in connection with every sort of action). And if it seems necessary to remove someone from power, his prerogatives should be taken away gradually, not all at once.

Further, a tyrant should refrain from every sort of wanton aggression, and from two in particular,[233] corporal punishment and the sort directed against the youth. He should take this precaution above all in the case of honor-lovers; for while money-lovers resent contemptuous acts affecting their property, honor-lovers and decent human beings resent those involving dishonor. That is why he should either not treat people in these ways or else be seen to punish like a father, not out of contempt, and to engage in intercourse with young people due to sexual causes, and not as if it were

232. 1313a34–b32.

233. Reading δυοῖν.

a prerogative of his office. In general, he should compensate what are believed to be dishonors with greater honors.

Among those who make attempts to destroy his body, a tyrant should most fear, and take the greatest precautions against, those who by deliberate choice do not care about preserving their lives after destroying his. That is why he should be especially wary of people who think that he has been wantonly aggressive toward them, or toward those they happen to care about; for people who attack out of spirit are careless of themselves, and, as Heraclitus said, "Spirit is a hard enemy to fight, because it pays with soul."[234]

Since cities consist of two parts, poor human beings and rich ones, it is best if both suppose that they are preserved because of the [tyrant's] rule, and that neither is unjustly treated by the other in anything. But whichever of them is the stronger these are the ones he should most attach to his rule, so that, with this support for his affairs, there will be no need for the tyrant to free slaves or confiscate weapons; for either one of the two parts added to his power will be enough to make them stronger than the attackers.

It is superfluous to discuss each particular thing of this sort; for their aim is evident. A tyrant should appear to his subjects not as a tyrant but as a household manager and a kingly man, not as an appropriator [of other people's things] but as a steward. He should also appear to pursue the moderate things of life, not the excessive ones, maintaining close relations with the notables, while acting the part of a popular leader for the many. For as a result, not only will his rule necessarily be nobler and more enviable by ruling over better people, who have not been humbled, and doing so without being hated and feared, but also his rule will be longer lasting, and, in addition, he himself, in his own character, will either be nobly disposed to virtue or else half good, not wicked but half wicked.

5.12[235]
Long-Lasting Tyrannies; Plato on Political Change

And yet the shortest-lasting of all constitutions are oligarchy and tyranny. For the longest-lasting tyranny was that of the sons of Orthagoras and Orthagoras himself in Sicyon.[236] It lasted a hundred years. The cause of this was that they treated their subjects moderately and were slaves to the laws in many areas; and, because Cleisthenes was skilled in warfare, he was not easily despised; and because in many ways, by their acts of concern, they acted like popular leaders. It is said, at any rate, that Cleisthenes

234. B85 DK.

235. Because this chapter omits the tyranny of Dionysius I, which lasted more or less for fifty years, and somewhat intrusively mentions oligarchy (1315b12) in a discussion devoted to monarchy, some scholars have doubted its authenticity.

236. Founded in 670 BC.

gave a crown to the judge who denied him victory in a competition; some even say that the seated figure in the marketplace is a statue of the man who gave the verdict. They say too that Pisistratus once allowed himself to be summoned for trial before the Areopagus.

The second-longest tyranny was that of the Cypselids in Corinth,[237] which lasted seventy-three years and six months; for in fact Cypselus was tyrant for thirty years, Periander for forty and a half, and Psammeticus, the son of Gorgus, for three. The causes of its lasting are also the same; for Cypselus himself was a popular leader and went without a bodyguard throughout his rule, while Periander, though he became tyrannical, was skilled in warfare.

The third-longest was that of the Pisistratids in Athens.[238] But it was not continuous; for Pisistratus, while he was a tyrant, went into exile twice, so that in a period of thirty-three years he was tyrant for seventeen. His sons ruled for eighteen years, so that the tyranny lasted for thirty-five years altogether.

The longest-lasting of the remaining tyrannies was the one associated with Gelon and Hiero at Syracuse.[239] Yet even this did not last long, but needed two more years to last for altogether twenty years. For Gelon was tyrant for seven and died in the eighth; Hiero for ten. Thrasybulus was expelled in his eleventh month. But the majority of tyrannies have all been quite short-lasting.

As regard constitutions and as regards monarchies, then, the sources of their destruction, and also their preservation, have now pretty much all been stated.

1316a1 In the *Republic*[240] things are said by Socrates about [constitutional] changes, but in fact what is said is not correct. For in the case of the first and best constitution he does not discuss the change special to it. For he claims that its cause is that nothing remains as it is, but that everything undergoes a sort of cyclical change, and that the starting-point of this lies in the elements four and three, which "married with five, give two harmonies," whenever, as he says, the number of this figure becomes cubed. His supposition is that nature sometimes produces people who are base and stronger than education. Perhaps he is not wrong in saying this (for there may be some people who are uneducable and cannot become excellent men). But how could this sort of change be any more special to the constitution he says is best than common to all the others and to everything that comes to be? And is it because of time, due to which, as he says, everything changes, that even things that did not start to exist at the same time change at the same time? If something comes to be on the day before the completion of the cycle, for example, does it still change at the same time as everything else?

In addition to this, what causes the best constitution to change into a constitution of the Spartan sort? For all constitutions more often change into their contraries than

237. Founded c. 657 BC.
238. 1305a23–24, 1311a36–39, 1313b23.
239. 1302b31–33, 1303a38–b2, 1312b9–17.
240. 545c–569c.

into the neighboring one. And the same argument also applies to the other changes. For he says that the Spartan constitution changes to an oligarchy, then from oligarchy to a democracy, then from democracy to a tyranny. And yet change may also occur in the contrary direction, for example, from democracy to oligarchy, and this happens even more often than from democracy to monarchy.

Further, as regards tyranny, he does not tell us whether there will or will not be a change, what will cause it to change [if it does], or what sort of constitution it will change into. The cause of this is that he could not easily have said; for it is indeterminate, since, according to him, it should change into the first or best constitution, for in this way the change would be continuous and in a circle. But tyranny also changes into another tyranny, as the constitution at Sicyon changed from the tyranny of Myron to that of Cleisthenes; into oligarchy, like that of Antileon in Chalcis;[241] and also into democracy, like that of Gelon and his family at Syracuse; and into aristocracy, like that of Charilaus in Sparta and the one in Carthage.[242]

Change also occurs from oligarchy to tyranny, as happened in Sicily with pretty much the majority of the ancient oligarchies: in Leontini, to the tyranny of Panaetius; in Gela, to that of Cleander; in Rhegium, to that of Anaxilaus; and similarly in many other cities.

It is also absurd to think that a constitution changes into an oligarchy because the officeholders are money-lovers and wealth-acquirers, and not because those who are far superior in property holdings think it unjust for those who possess no property **1316[b]1** to share equally in the city with those who do possess it. In many oligarchies, in fact, officeholders are not only not allowed to acquire wealth, but there are laws to prevent it. On the other hand, in Carthage, which is governed democratically,[243] the officials do engage in acquiring wealth, and it has not yet undergone change.

It is also absurd to say that an oligarchic city is really two cities, one of the rich and one of the poor. For why is this any more true of it than of the Spartan constitution, or any other constitution where the citizens do not all possess an equal property or are not all similarly good men? And even when no one becomes any poorer than he was, constitutions still undergo change from oligarchy to democracy, if the poor become a majority, or from democracy to oligarchy, if the rich part happens to be stronger than the multitude, and the latter are negligent, while the former turn their thought toward [change].

Although there are in fact many causes of changes, Socrates states but one, that by leading a profligate life, and borrowing excessively and paying interest, they become poor—as if all or most of the citizens were rich at the start. But this is false. Rather, when men of the leading group lose their properties, they stir up change; but when

241. In apparent conflict with 1304[a]29–31.
242. In apparent conflict with 1272[b]24–33.
243. In apparent conflict with 1273[a]6–13, 1293[b]14–16.

some of the others do so, nothing terrible happens. And even when change does occur, it is no more likely to result in a democracy than in some other constitution.

Further, if people have no share in the honors of office or are treated unjustly or with wanton aggression, they engage in faction and change constitutions, even if they have not squandered all their property because it is open to them to do whatever they wish (the cause of which, Socrates says, is too much freedom).

Although there are many sorts of oligarchies and democracies, Socrates discusses their changes as if there were only one of each.

BOOK 6

6.1
Mixed Constitutions and Forms of Democracy

How many different sorts there are of the deliberative and controlling element of the constitution, then, the ways of ordering offices and courts, which sort has been ordered with a view to which sort of constitution, and further, as regards the destruction and preservation of constitutions, from what sources and due to what causes they come about, were stated previously.[244]

But since it turned out that there are several forms of democracy and likewise of the other constitutions, it will be well to investigate whatever remains to be said about these, and to determine the mode that properly belongs, and is advantageous, to each of them. Further, the combinations of all the modes of ordering the things we **1317a1** mentioned must be investigated; for these, when coupled, make constitutions overlap, resulting in oligarchic aristocracies and democratically inclined polities. I mean those couplings[245] that should be investigated, but up to now have not been—for example, where the deliberative part and the part that is concerned with the election of officials are ordered oligarchically, but the part that is concerned with the courts is aristocratic, or where the part that is concerned with the courts and the deliberative part are oligarchic, but the part that is concerned with the election of officials is aristocratic, or where, in some other way, not all the parts properly belonging to the constitution are combined.

Which sort of democracy is fitting for which sort of city, and likewise which sort of oligarchy for which sort of multitude, and which of the remaining constitutions is advantageous for which, were spoken about previously. Nonetheless, since one should make clear not only which sort of constitution is best for a city, but also how it and the other sorts should be established, let us briefly go through this. Let us

244. 4.14–16, 5.1–12.

245. These hybrid constitutions are not discussed in the extant *Politics*.

speak first about democracy; for that will at the same time make evident the opposite constitution, the one that some people call "oligarchy."

To carry out this methodical inquiry, one must grasp all the features that are democratic and that are believed to go along with democracies; for it is as a result of the way these are combined that the various forms of democracy arise, and more than one different sort of each. For there are two causes for there being several democracies. The first is the one mentioned previously,[246] that there are different sorts of people (for there is the farming multitude, the unrefined one, and that manual laboring one, and when the first of these is added to the second, and the third again to both of them, this creates a difference not only with respect to the democracy's being better or worse, but even with respect to its not being the same [sort of democracy]). But the second is the one we are speaking about now. For the features that go along with democracy and are believed to properly belong to this constitution, when they are [differently] combined, make democracies differ; for with one sort a few of these features will go along, with a second more, and with a third all of them. But it will be useful to gain knowledge of each of them, whether for the purpose of establishing whichever of these sorts of democracy one happens to wish for, or for the purpose of rectifications. For those who are putting in place a constitution seek to combine all the features that properly belong to its hypothesis, although they err in doing so, as was stated previously[247] in our discussions of the destructions and preservations of constitutions.

Now let us discuss the axioms and characters [of the various forms of democracy] and what it is they aim at.

6.2
The Hypothesis of Democracy

The hypothesis of the democratic constitution is freedom (for people usually say that only in this constitution do they share in freedom; for all democracies, they say, aim at this). One sort of freedom is ruling and being ruled in turn. For in fact democratic justice is equality in accord with number, not in accord with worth. But if this is what is just, then the multitude must be in control, and whatever seems so to the majority, this must be the end and this must be what is just; for they say that each of the citizens should have an equal share, with the result that in democracies the poor happen to have more control than the rich; for they are the majority, and what seems so to the majority is in control. This, then, is one sign of freedom, which all democrats take as a defining mark of their constitution. Another one is to live as one wishes. For this, they say, is the work of freedom, if indeed that of slavery is not to live as one wishes. This,

246. $1291^{b}14–28$, $1292^{b}22–1293^{a}34$, $1296^{b}24–31$.
247. $1309^{b}18–35$.

then, is the second defining mark of democracy. From it arises the demand not to be ruled, best of all to be ruled by no one, or, failing that, to rule and be ruled in turn. In this way the second goal contributes to freedom in accord with equality.

When these things are presupposed and the starting-point is of this sort the following features are democratic: Having all choose officials from all. Having all rule each and each in turn rule all. Having all offices, or all that do not require experience or craft knowledge, filled by lot. Having no property assessment for the offices or as low a one as possible. Having no office, or few besides military ones, held twice or more than a few times by the same person. Having all offices or as many as possible be short-term. Having all, or[248] bodies chosen from all, judge all cases, or most of them and the ones that are most important and involve the most control, such as those having to do with the inspection of officials, the constitution, or private transactions. Having the assembly control everything or the most important things, but having no office control any or as few as possible. Among the offices, the most democratic is the council, when there is ample pay for no one; for where there is ample pay, even this office is stripped of its power; for when the people are well paid, they take all judgments into their own hands (as was said previously in the methodical inquiry before this one[249]). Having pay provided, preferably for all, for the assembly, courts, and public offices, or, failing that, for service in the offices, courts, council, and the assemblies with full control,[250] or for those offices that require their holders to share a communal mess. Further, since oligarchy is defined by family, wealth, and education, their contraries (lack of breeding, poverty, and lack of refinement) are held to be characteristically democratic. Further, it is democratic to have no office be permanent; **1318a1** and if such an office happens to survive an ancient change of constitution, at any rate, to strip it of its power and make it be filled by lot instead of election.

These, then, are the features common to democracies. And from the justice that is agreed to be democratic, which consists in everyone having equality in accord with number, comes what is believed to be most of all democracy and rule by the people. For equality consists in the poor neither ruling more than the rich nor being alone in control, but in all ruling equally on the basis of equality in accord with number; for in that way they would acknowledge that both equality and freedom are present in the constitution.

6.3
Democratic Equality

The next issue is the puzzle that arises as to how they will achieve this equality. Should they divide the assessed property so that that of five hundred citizens equals that of a thousand others, and then give equal power to the thousand as to the five hundred?

248. Reading ἢ.
249. 1299b38–1300a4.
250. *Ath*. 43.4.

Or is this not the way to set up equality in accord with this? Should they instead divide as before, then take an equal number of citizens from the five hundred as from the thousand and give them control of the elections and the courts? Is this, then, the constitution that is most just in accord with democratic justice? Or is it rather the one in accord with the quantity [of people]? For democrats say that this is just, whatever seems so to the greater number, while oligarchs say that it is whatever seems so to those with the most property; for they say that it is in accord with quantity of property that it should be judged. Both views involve inequality and injustice; for if justice is whatever the few believe it to be, it is tyranny (for if one person has more than the others who are rich, then, in accord with oligarchic justice, he is just in ruling alone). On the other hand, if justice is what the majority in accord with number believe, they will commit injustice by confiscating the property of the rich and few (as was said previously[251]).

What sort of equality there might be, then, that both would agree on must be investigated on the basis of the definitions of justice they both give. For they both say that the belief of the majority of the citizens should be in control. Let this stand, then, though not fully. Rather, since as it happens there are in fact two parts of which a city is composed, the rich and the poor, let whatever is the belief of both, or of a majority of both, have control. But if their beliefs are contrary, let that of the majority (that is, of those whose assessed property is [collectively] greater) prevail. For example, if there are ten rich citizens and twenty poor ones, and contrary beliefs are held by six of the rich and fifteen of the poorer ones, four of the rich having been added to the poor, and five of the poor to the rich, then let whichever group's property assessment is greater when the properties of both the rich and poor on each side are added together have control. But if the amounts happen to be equal, let it be considered a common puzzle, as it is now when the assembly or the court is split; for let it be settled by lot or let something else of that sort be done. **1318**[b]**1**

But even if it is very difficult to discover the truth about equality and justice, still this is easier to attain than to persuade the people who have the power to get more; for the weaker always seek the equal and the just, while the strong give no thought to them.

6.4
Ranking Democracies

Among the four sorts of democracy, the first in order is the best, as was said in the discussions before these.[252] It is also the most ancient of them all. And I call it "first" in the very same way that one might distinguish peoples. For the best people is the

251. 1281[a]14–28.
252. 1291[b]30–1292[a]38, 1292[b]25–1293[a]10.

sort that farms, and so it is also possible to create a democracy where the multitude live by cultivation or by herding. For because they do not have much property, they lack leisure and cannot attend meetings of the assembly frequently. And because they do not have[253] the necessities, they spend their time on their works and do not have an appetite for other people's property. Indeed, working is more pleasant to them than engaging in politics and holding office, where large gains are not to be had from office. For ordinary people seek profit more than honor. A sign of this is that they used to put up with the ancient tyrannies, and continue to put up with oligarchies, so long as no one prevents them from working or takes anything away from them; for some of them quickly become rich, while the others [at least] do not live in poverty. Further, having control of the election and inspection of officials fulfills their need, if they do have any love of honor. In fact, among some peoples, even if the multitude do not share in the election of officials, but electors are chosen from all the citizens by turns, as in Mantinea,[254] still, if they have control of deliberation, they are content. This scheme too should be considered a shape of democracy, as it was once at Mantinea.

That is why, then, in the democracy that was mentioned, it is both advantageous and customary for all the citizens to elect and inspect officials and sit on juries, but for the holders of the most important offices to be elected, and to be from those with a certain amount of assessed property (the higher the office, the higher the assessment), or alternatively for officials not to be elected on the basis of property assessments at all, but of their capacities. People who are governed in this way are necessarily governed well (for the offices will always be in the hands of the best, since the people will wish it and not envy the decent). And to the decent and notable people this ordering is satisfactory, for they will not be ruled by their inferiors, and will rule justly because the others have control of the inspection of officials. For to be dependent, and not to be able to do whatever one believes [to be good], is advantageous; for the license to do whatever one likes leaves one defenseless against the base element that exists in every human being. So the necessary result, which is precisely the one that is most beneficial in constitutions, is that the decent people rule while being kept from error, and the multitude are in no way shortchanged.

It is evident, then, that this is the best of the democracies, and also what cause this is due to, that the people are of a certain sort. And with a view to establishing a farming people, some of the laws laid down in many cities in ancient times are very useful—for example, wholly prohibiting the ownership of more than a certain amount of land, or else more than a certain amount situated between a given place and the city proper or the city. And there used to be legislation in many cities (at any rate in ancient times) forbidding even the sale of the first allotments of land, and also one, said to derive from Oxylus, with a similar sort of effect, forbidding lending

253. Rejecting the seclusion of μὴ.
254. 1304a25–27.

against any portion of each person's land. As things stand, however, one should also attempt rectification by using the law of the Amphytaeans, as it too is useful with a view to what we are speaking about; for they, though numerous but having little land, are nonetheless all engaged in farming; for property assessments are not of whole estates but in accord with such small subdivisions of them that even the poor can exceed the assessment.

After the multitude of farmers, the best people consist of herdsmen, who get their living from livestock; for herding is in many respects much the same as farming, and with a view to military actions, they are above all well prepared in their habits, and they have usable bodies and are able to live in the open. The other multitudes, of which the remaining sorts of democracies are composed, are pretty much all a lot more base than these; for their mode of life is base, and there is no element of virtue involved in the work to which the multitude of unrefined people, tradesmen, and hired laborers put their hand. Further, because they wander around the marketplace and city proper, (one might almost say) this entire kind can easily attend the assembly. Farmers, on the other hand, because they are scattered throughout the countryside, neither meet nor have the same need for this sort of meeting. And where the situation of the territory is such that the countryside is widely separated from the city, it is easy to create a democracy that is good and [like] a polity; for the multitude are compelled to make their settlements out in the countryside areas, so that, even if there is a whole mob that frequents the marketplace, one should simply not hold assemblies in democracies without the multitude from the countryside.

How, then, the best or first democracy should be established has been stated. But how the others should be established is also evident. For they should deviate stepwise [from the best], always excluding a worse multitude.

The ultimate democracy, because everyone has a share, is not one that every city **1319**^{b}**1** can tolerate, nor can it easily endure if its laws and customs are not well composed. (What factors cause the destruction of this and other constitutions have pretty much all been stated previously.[255]) With a view to putting in place this sort of democracy and making the people strong, the leaders usually admit as many as possible to citizenship, and make citizens not only of the legitimate children of citizens but also of the illegitimate ones, and those descended from citizens on only one side (I mean their mother's or their father's); for this entire element more properly belongs to this sort of democracy. This, then, is how popular leaders usually establish a constitution of this sort. Yet they should accept additional citizens only up to the point where the multitude outnumber the notables and those in the middle, and not go beyond this; for when they do overshoot it, they make the constitution more disorderly and provoke the notables to such an extent that they find the democracy hard to endure—which is precisely what was the cause of the faction at Cyrene; for a wicked element gets overlooked when it is small, but as it grows larger it is more before one's eyes.

255. 5.5.

Further, also useful with a view to a democracy of this sort are the establishments that Cleisthenes used in Athens[256] when he wished to increase the power of the democracy, and that those setting up the democracy used at Cyrene. For different and more numerous tribes and clans should be created, private cults should be absorbed into a few public ones, and every subtlety devised to mix everyone together as much as possible and break up their previous associations.

Further, all tyrannical establishments are held to be democratic. I mean, for example, no supervision of slaves (which may really be advantageous to a democracy up to a certain point), or of women or children, and allowing everyone to live as he wishes; for numerous people will support a constitution of this sort; for it is more pleasant for ordinary people to live in a disorderly fashion than in a temperate one.

6.5
Preserving Democracies

For a legislator, however, or for those seeking to set up a constitution of this sort, setting it up is not the most important work nor indeed the only one, but rather its being preserved; for it is not difficult for those who govern themselves in any way whatever to continue for a day or even for two or three days. That is why one should take the things we got a theoretical grasp on previously[257] about the sorts of preservation and destruction characteristic of constitutions, and from these try to establish stability, carefully avoiding the causes of destruction, while setting up the sort of laws, both written and unwritten, that best encompass the features that preserve constitutions. And one should consider a measure to be democratic or oligarchic not if it will make the city as democratically governed or as oligarchically governed as possible, but if it will make it so for the longest time.

Popular leaders nowadays, however, in their efforts to gratify the people, confiscate many properties through the courts. That is why those who care about the constitution should counteract this by passing a law that nothing that belonged to a condemned person should be confiscated and absorbed into communal property, but rather into sacred property; for those doing injustice will be no less deterred (for they will be fined in the same way as before), while the mob will less frequently condemn defendants (for they will not expect to gain anything). Further, public suits should always be made as few as possible by deterring with large penalties those who bring frivolous ones; for people usually bring them against notables, not men of the people. All citizens should be well-disposed toward the constitution or, failing that, they should at least not regard those in control as their enemies.

256. 1275b34–37.
257. Book 5.

Since ultimate democracies are populous and attending the assembly without wages is difficult, this situation is hostile to the notables in places where there happens to be a dearth of revenues (for the wages have to be obtained from taxes, confiscations of property, and bad courts—things that have already overturned many democracies). Where revenues are lacking, then, few assemblies should be held, and courts with many judges should be in session but for only a few days (for this helps reduce the fears of the rich about expense, provided the rich do not receive pay for jury service but only the poor do, and also greatly improves the quality of judgments in suits; for the rich are unwilling to be away from their private affairs for many days, but are willing to be so for brief periods).

Where there are revenues, however, one should not do what popular leaders do nowadays (for they distribute any surplus [to the poor], who no sooner get it than they need the same again; for helping the poor in this way is like pouring water into the proverbial leaking jug). But the true man of the people should see to it that the multitude are not too poor; this is a cause of the democracy being a bad one. Measures must, therefore, be crafted to ensure long-term prosperity. And, since this is also advantageous to the rich, whatever is left over from the revenues should be collected together and distributed in lump sums to the poor, especially if enough can be accumulated for the acquisition of a plot of land, or, failing that, for a start in trade or farming. And if this cannot be done for all, distribution should instead be by turns in accord with tribe or some other part. In the meantime, the rich should be taxed to provide pay for necessary meetings of the assembly, while being released from pointless public services. **1320**[b]**1**

It is by governing in this sort of way that the Carthaginians[258] have made a friend of the people; for by always sending some of them out to their subject cities, they made them rich. But it is also characteristic of notables who are refined and have understanding to divide the poor amongst themselves and give them a start in turning their hand to doing work. It is well too to imitate the policy of the Tarentines. For by giving communal use of their property to the poor they procure the goodwill of the multitude. They also divided all their offices into two, some that are elected and some chosen by lot: by lot, so that the people share; elected, so that they are better governed. But this can also be done by dividing the same office between those people chosen by lot and those elected.

How democracies should be established, then, has now been stated.

6.6
Preserving Oligarchies (1)

It is also pretty much evident from these remarks how oligarchies should be established. For each oligarchy should be put together from its contraries, by analogy with the contrary democracy, as in the case of the most well mixed and first of the

258. 2.11.

oligarchies, which is the one that is very close to so-called polity. Here the property assessments should be divided in two, some being made smaller and some larger, the smaller ones as the threshold for people being eligible for the necessary offices, the larger ones, for the offices with more control. Anyone who acquires a qualifying property should be allowed to share in the constitution, and the assessment should be used to admit a sufficiently large number of the people that those who share in the constitution will be stronger than those who do not share in it, and those who do share should always be drawn from the better part of the people.

The next oligarchy should be established in a similar way, with a slight tightening [of the qualifications for citizenship].

As for the oligarchy that is contrary to the ultimate democracy, which is the most dynastic and tyrannical sort of oligarchy, the worse it is, the more guarding it requires. For just as bodies that are in good health and ships that are in good condition for a voyage, and as regards their sailors, can admit of more errors without being destroyed thereby, while diseased bodies and ships with loose timbers that happen to have bad sailors cannot survive even a small number of errors, so too the worst constitutions need the most guarding.

1321a1 Democracies are generally preserved by populousness (for this is opposed to justice in accord with worth). But it is clear that an oligarchy must, on the contrary, attain its preservation by good order.

6.7
Preserving Oligarchies (2)

Since there are four principal parts of the multitude (farmer, unrefined, tradesman, and hired laborer) and four that are useful in war (cavalry, hoplite, light infantry, and naval), where the territory happens to be fit for cavalry, there conditions are naturally well suited for establishing a strong oligarchy (for the security of the inhabitants is attained because of a force of this sort, and horse-breeding is in the hands of those who own large estates). Where the territory is fit for hoplites, on the other hand, conditions favor the next sort of oligarchy (for hoplites are more often rich than poor).

A force of light infantry and a naval force, however, are altogether democratic. Therefore, as things stand, wherever there are large numbers of these, and there is factional conflict, the oligarchs often get the worst of the contest. As a cure for this, one should adopt the practice of military commanders who couple a fitting contingent of light infantry to their forces of cavalry and hoplites. This is the way the people prevail over the rich during factional conflicts; for light infantry can easily take on cavalry and hoplites. Oligarchs who put in place such a force drawn from these, then, are putting in place a force against themselves. But since there is a difference of age, and some are older and others younger, they should have their own sons taught lightly armed and unarmed combat while they are young, so that when the latter

have been taken out of the ranks of the boys they will themselves be trained doers of these works.

The multitude should be given a share in the governing body, either in the way stated previously, to those who own an assessed amount of property, or, as in Thebes,[259] to those who have kept out of unrefined works for a given period of time, or, as in Massilia,[260] to those who are judged to be worthy of it, whether they come from inside or outside the governing body.

Further, the offices with the most control, which those in the constitution should hold, should also have public services attached to them, in order that the people will voluntarily not share in them, and will sympathize with rulers on the grounds that they pay a heavy price for office. It is also fitting that, on entering office, they should offer magnificent sacrifices and establish something for the community, in order that the people, through sharing in the festivities, and seeing the city adorned here with votive statues and there with buildings, will be glad to see the constitution endure, and as a result the notables too will have memorials of their expenditure. As things stand, however, those connected with oligarchies do not do these things but the contrary ones, because they seek profit no less than honor. That is why it is well to say that they are miniature democracies.

Let how democracies and oligarchies should be put in place, then, be determined this way. **1321**[b]**1**

6.8
Sorts of Office

Following what has been said there is the matter, as was said previously,[261] of correctly dividing what pertains to the offices, how many they are, what they are, and concerned with what. For without the necessary offices a city cannot exist, and without those related to good order and arrangement it cannot be well managed.

Further, in small cities the offices are necessarily fewer, while in larger ones they are more numerous, as was also said previously.[262] The question of which offices it is fitting to combine, then, and which to keep separate should not be overlooked.

The first of the necessary supervisions, then, is the one concerned with the market, over which there should be some office to supervise contracts and good order; for in pretty much all cities it is necessary that people buy and sell with a view to supplying each other's necessary needs. This is also the readiest way to achieve self-sufficiency, which is believed to be what leads people to join together in one constitution.

259. 1278[a]25–26.
260. 1305[b]1–12.
261. 1298[a]1–3, 1300[b]7–12, 1316[b]39–1317[a]10.
262. 1299[a]31–[b]30.

Another sort of supervision, connected to this one and close to it, is the supervision of public and private property within the city proper, so that it may be kept in good order; also, the preservation and rectification of decaying buildings and roads, the supervision of property boundaries, so that disputes do not arise over them, and all other sorts of supervision similar to these. Most people call this sort of office "city management,"[263] though its parts are more than one in number. More populous cities assign different officials to these parts, for example, wall repairers, well supervisors, and harbor guards.

Another office is also necessary and much the same as this one; for it is concerned with the same areas, though it concerns the countryside and matters outside the city proper. In some places its holders are called "country managers," in others "foresters." These, then, are three sorts of supervision of these things. But another is the office by which public revenues are received, guarded, and distributed to each branch of the administration. Its holders are called "receivers" or "treasurers."

Another is the office by which both private contracts and judgments from the courts must be recorded. Judicial indictments and presentations of judicial proceedings[264] must be recorded by these same officials. In some places this office too is divided into several ones; in others a single office has control of all these matters. The officials are called "sacred recorders,"[265] "supervisors," "recorders," and other names close to these.

The next after this, and pretty much the most necessary and the most difficult of the offices, is the one concerned with actions against those who have been convicted in court, and those whose names are posted as public debtors, and with the guarding of their bodies. It is a difficult office because it provokes a lot of hatred. So where it is not possible to make large profits from it, people are either unwilling to hold it, or those who do hold it are unwilling to act in accord with the laws. It is a necessary office, however, because there is no benefit in having judicial proceedings about matters of justice, if they do not achieve their end. So if, when the former do not occur, people cannot live in a community with each other, they cannot do so either when no actions are taken. That is why it is better for this not to be one office but to consist of several people drawn from different courts, and why one should try to divide up the offices connected with posting the list of debtors in a similar way.

Further, it is also better to have [other] officials take some of the actions; in particular, incoming officials should take those imposed by outgoing ones, and, in the case of sitting officials, one should pass sentence and another take the action. For example, the city managers should take the action imposed by the marketplace managers, while other officials take those imposed by the city managers; for the less hatred there is toward those who take the action, the more the actions will achieve their end. To have the same people pass sentence and act on it doubles the hatred, and to have the same people do so in all cases makes them an enemy to everyone.

263. *Ath*. 50.2.
264. *Ath*. 52.2–3.
265. *Ath*. 30.2.

In many places the office that keeps prisoners in custody is different from the one that carries out the sentence, as, for example, in the case of the office of the so-called Eleven in Athens. That is why it is also better to split it up, and to use the same subtle device in its case too. For though it is no less necessary than the previous one, decent people avoid this office most of all, but giving control of it to depraved ones is not safe; for they themselves are more in need of guarding than capable of guarding others. That is why there should not be a single office assigned to guard prisoners, nor the same office continuously. Instead, prisoners should be supervised by different people in turn, chosen from among the young men, in places where there is a regiment of ephebes[266] or guards, or from the other officials.

These offices are to be counted as first, then, as the most necessary. After these there are others that are no less necessary, but ranked more highly; for they require much experience and trustworthiness.

The offices concerned with the defense of the city are of this sort, and any that are ordered to meet its military needs. In both peacetime and wartime alike there should be supervisors to supervise the defense of the gates and walls, and likewise the inspection and marshaling of the citizen troops. In some places there are more offices assigned to all these areas; in others there are fewer (in small cities, for example, a single office is concerned with all of them). Such people are called "generals" or "war-officers." Further, if there are also cavalry, light infantry, archers, or a navy, **1322^{b}1** an office is sometimes put in place for each of them. These are called the office of "admirals," of "cavalry commanders," and of "regimental commanders," while those in charge of the units under these are called the office of "warship commanders," of "company commanders," and of "tribal leaders," and so on for their sub-units. But all of these together are included in a single form: supervision of military matters. This, then, is the way things stand with regard to this office.

But since some if not all of the offices handle large quantities of public property, there must be a different office to receive and examine their accounts, which does not itself handle any other matters. Some call these "inspectors," "accountants," "auditors," or "advocates."

Besides all these offices, there is the one that has most control of everything; for the same office often has control over the implementing as well as the introduction of a measure, or else[267] presides over the multitude where the people have control; for there must be some body to convene the controlling element in the constitution. In some places, these are called "preliminary councilors" (*probouloi*), because they make preliminary deliberations (*probouleuein*) [for the assembly].[268] But where the multitude are in control they are called a "council" instead.

The offices that are political, then, are pretty much this many.

266. *Ath*. 42.3.
267. Reading ἢ.
268. *Ath*. 45.4.

Another form of supervision, however, is that concerned with the gods—for example, priests, supervisors of matters relating to the temples (such as the preservation of existing buildings, the restoration of decaying ones), and all other things that that are ordered in relation to the gods. In some places it happens that a single office supervises all of this—for example, in small cities. But in other places there are many officials who are separate from the priesthood—for example, supervisors of sacrifices, temple guardians, and treasurers of sacred funds. Next after this is the office set aside for all the public sacrifices that the law does not assign to the priests, but which have the honor [of being celebrated] from the communal hearth. These officials are called "archons" by some, "kings" or "presidents" by others.

The necessary sorts of supervision, then, to speak in summary form, are concerned with the following: daimonic affairs, military affairs, revenues and expenditures, the market, the city proper, harbors, and the countryside; further, matters relating to the courts, such as registering transactions, [taking legal] actions, keeping prisoners in custody, receiving accounts, and inspecting and examining officials; and, finally, matters relating to the element that deliberates about public affairs.

Special to cities that enjoy greater leisure and prosperity, on the other hand, and that also pay attention to good order are the offices dealing with the supervision of women, the guardianship of the laws, the supervision of children, control of the gymnasia, and, in addition to these, the supervision of athletic and Dionysiac contests, as well as of any other such public spectacles there may happen to be.[269] Some of these are obviously not democratic—for example, the supervision of women and that of children; for the poor have to employ their women and children as servants, because of their lack of slaves.

There are three offices that cities use to supervise the election of the officials who are in control: law guardians, [preliminary] councilors, and council. The law guardians are aristocratic, the preliminary councilors oligarchic, and the council democratic.

As regards offices, then, pretty much all of them have been spoken about in outline.

BOOK 7

7.1
The Most Choiceworthy Life

Anyone who is going to make an inquiry about the best constitution in the appropriate way must first determine what the most choiceworthy life is. For if this remains unclear, what the best constitution is must also remain unclear; for it is appropriate

269. *Ath*. 56.5, 57.1, 60.1, 60.3.

for those people who govern themselves in the best way to do the best that their circumstances allow—provided nothing contrary to reasonable expectation occurs. That is why there should first be agreement about what the most choiceworthy life is for (one might almost say) everyone, and then determine whether it is the same or distinct for all communally as for each separately.

Considering many things said about the best way of living even in the external accounts to be adequate, then, these must be made use of here as well. For, to tell the truth, as regards one way of dividing them at any rate, no one would dispute that, since there are three groups—external goods, goods in the body, and goods in the soul—all of them must belong to those who are blessed. For no one would say that someone is blessed who has no shred of courage, temperance, justice, or practical wisdom, but is afraid of the flies buzzing around him, stops at nothing, no matter how extreme, when he has an appetite to eat or drink, kills his dearest friends for a pittance, and has thoughts as foolish and deluded as a child's or a madman's.

But while these claims are ones that almost everyone would agree with, people disagree about their quantity and their relative superiority. For they consider any quantity of virtue, however small, to be sufficient, while of wealth, property, power, reputation, and the like they seek unlimited excess. We, however, will say to them that it is easy to achieve conviction on these matters even from the facts themselves, since we see that the virtues are not acquired and safeguarded by means of external goods, but rather it is the other way around, and living happily for human beings, whether it consists in enjoyment or virtue or both, is possessed **$1323^{b}1$** by those who have cultivated their characters and minds excessively, but have been moderate in their acquisition of external goods, rather than by those who have acquired more of the latter than they can possibly use, but are deficient in the former.

But to those who investigate the matter in accord with argument, the point is also easily seen. For external goods have a limit, just like any instrument, and everything useful is useful for something, and their excess must either harm or bring no benefit to their possessors. In the case of each of the goods of the soul, by contrast, the more excessive it is, the more useful it is—if one should assign to these goods too not only nobility but also utility.

In general, it is clear too, we will say, that the best condition of each thing relative to others is in accord with the superiority of those things whose conditions we say they are. So, if indeed the soul is more estimable, both unconditionally and to us, than property and the body, its best condition of each one of them must be proportionally better than that of the others. Further, it is for the sake of the soul that these things are naturally choiceworthy and that every practically wise person should choose them for its sake, not the soul for theirs.

Let us take it as agreed among us, then, that to each person falls just as much happiness as he has virtue, practical wisdom, and action done in accord with them.

As evidence of this, we may use the [primary] god,[270] who is happy and blessedly so, not because of any external goods but because of himself and by being in his nature of a certain quality. That is also why good luck and happiness are necessarily different (for chance or luck is the cause of the goods external to the soul, but no one is just or temperate by luck or because of luck).

The next point, and one depending on the same arguments, is that the happy city too is the one that is best and acts nobly. But it is impossible for those who do not do noble things to act nobly, and there is no noble work, either belonging to a man or to a city, that is separate from virtue and practical wisdom. But the courage, justice, practical wisdom, and temperance of a city have the same capacity and shape as those in which each human being who is said to be courageous, just, practically wise, and temperate should share.

But let these remarks, as far as they go, serve as a preface to our account; for not to touch on these issues is impossible, but neither can we go through all the arguments pertaining to them, for that is work for another leisured discussion.[271] But for now, let this much be assumed, that the best life, both for each separately and for cities collectively, is one involving virtue that is sufficiently furnished with the resources needed to participate in actions that are in accord with virtue. With regard to those who dispute this, we must ignore them in our present methodical inquiry, but investigate their objections later, if anyone happens not to be persuaded by what has been said.

7.2
The Political Life and the Philosophical Life (1)

But whether happiness must be said to be the same thing both for each individual human being and for a city or not the same thing remains to be discussed. But here too the answer is evident. For everyone would agree that they are the same. For those who suppose that living well in the case of an individual lies in wealth will also count blessed a whole city if it is rich. And those who have the highest esteem for the tyrannical life would say that the city that rules the greatest number is happiest. And if someone approves of an individual because of his virtue, he will also say that the more excellent city is the one that is happier.

But already there are two questions that need to be investigated. First, which life is more choiceworthy, the one that involves being active in politics with other people and sharing in the city, or rather the life of an alien, detached from the political community? Further, what constitution and what condition of the city is to be counted as best—regardless of whether sharing in a city is choiceworthy for everyone or for most but not for some? Since [to answer] this question, but not the one about what

270. *Met.* 12.7–10.
271. E.g., that in *NE* and *EE*.

is choiceworthy for each, is a work of political thought and theoretical investigation, and this is the sort of investigation we have deliberately chosen to undertake now, the first is a side issue, while the second is a work of our methodical inquiry.

It is evident that the best constitution is necessarily that order in accord with which anyone might be able to do best and live blessedly. But the very people who agree that the most choiceworthy life is the life that involves virtue are the ones who dispute about whether the political and practical life is choiceworthy or rather the one detached from all external concerns—some sort of contemplative life, for example, which some say is the only life for a philosopher. For it is evident that these two lives are pretty much the ones that the human beings most ambitious for virtue deliberately choose, both in earlier times and at present. The two I mean are the political life and the philosophic one. And it makes no small difference on which side the truth lies; for the person, at any rate, who thinks correctly must order his affairs by looking to the better target—and this applies to each human being and to the constitution communally.

Some people think that ruling as a master over one's neighbors involves one of the greatest injustices, and that political rule, while it involves no injustice, does involve an impediment to the ruler's own joy in life. But others hold beliefs that are almost the contrary; for they think that the practical and political life is the only one for a man; for the actions resulting from each virtue are not more open to private individuals than to those who are active in communal affairs and participate in politics. Some, then, give this reply, but others say that the mode of constitution that rules as **1324b1** a master or a tyrant is the only happy one. Among some peoples, indeed, this is the defining mark of the constitution and the laws—to rule as a master over neighbors.

That is why, although most laws have been laid down in most cases (one might almost say) at random, nonetheless if there is some one thing to which the laws do to some extent look, it is the exercise of power that they all aim at. For example, in Sparta and Crete it is pretty much entirely with a view to wars that education and most of the laws are ordered. Further, among all the [barbarian] nations that have the power to get more this power is esteemed—for example, among the Scythians, Persians, Thracians, and Celts. For in some cases they even have laws that spur them on to this sort of virtue. In Carthage, for example, so it is said, they receive armlets as decorations for each campaign in which they serve. There was once a law in Macedonia too that any man who had not killed an enemy must wear as his belt a rope used to tether a horse to a manger. Among the Scythians, anyone who had not killed an enemy was not permitted to drink from a cup passed around at a certain feast. And among the Iberians, a warlike nation, they plant as many small obelisks around a man's tomb as the number of enemies he has killed. And there are many other things of this sort among other peoples, some sanctioned by the laws, others by customs.

And yet it would presumably seem quite absurd to those wishing to investigate the matter, if the work of a politician is to be able to get a theoretical grasp on how to rule or master his neighbors, whether they wish it or do not wish it. For how could

this be up to a politician or a legislator, when it is not even lawful? And it is unlawful to rule not only justly but also unjustly (although it is in fact possible to exercise power unjustly).

Moreover, this is not what we see in the other sciences either; for it is not the doctor's or the ship captain's work to persuade or otherwise use force against his patients (in the one case) or his passengers (in the other). But many seem to think that mastership is politics, and the very same thing they all deny to be either just or advantageous for themselves, they are not ashamed to practice on others; for they seek just rule among themselves, but toward others they care nothing about justice. It is strange, though, unless it is by nature that one thing is suited to be ruled by a master and another not suited to be ruled by a master. So if indeed things are that way, one must not try to rule as a master over everyone, but only over those who are suited to be ruled by a master, just as one must not hunt human beings for a feast or a sacrifice, but rather what is suited to being hunted for this—and any wild beast that is edible is suited to being hunted.

Moreover, it is possible for a single city to be happy even by itself (that is, one that is governed in a good way), if indeed it is possible for a city to be settled somewhere by itself and employ excellent laws, and whose constitution will not be ordered with a view to war or to controlling its enemies; for it is to be assumed that it has none.

It is clear, therefore, that all military pursuits are to be counted as noble, not as being the highest end of all, but rather as being for the sake of that end. And [the work] of an excellent legislator is to see how a city, a race of human beings, or any other community can come to have a share in good living and in the happiness that it is possible for them. There will be differences, indeed, in some of the laws that are prescribed, and it belongs to legislative science to see, if there are neighboring peoples, what sorts of things must be practiced in relation to what sorts of people and how the appropriate ones are to be used in relation to each.

But this issue—what end the best constitution should aim at—will receive an appropriate investigation later on.[272]

7.3
The Political Life and the Philosophical Life (2)

As regards those who agree that a life that involves virtue is most choiceworthy, but disagree about the use of it, we must say to both sides that they are both in part correct in what they say and in part incorrect. For those on one side reject political offices, since they consider that the life of a free person is different from that of a politician and is also the most choiceworthy one of all, while those on the other side

272. 7.13–15.

consider that the political life is best; for it is impossible for someone who does no action to do well, and doing well in action and happiness are the same.

On the one side we have that the life of a free person is better than that of a master. This is indeed true; for there is certainly nothing dignified about using a slave as a slave; for giving orders about necessities has no share in what is noble. But to consider that every rule is rule of a master is surely incorrect; for there is no less a distance between rule over free people and rule over slaves than between being by nature free and being by nature a slave. Enough has been determined about these in our first accounts.[273]

On the other side, to praise inaction more than action is not correct; for happiness is action, and further, the actions of those who are just and temperate achieve an end of many things that are noble.

And yet perhaps someone might take these determinations to imply that control over everyone is best; for in that way one would control the greatest number of the actions that are noblest. And so someone who has the power to rule should not let rule pass to his neighbor, but rather take it away from him. And a father should take no account of his children, or a child of his father, or in general a friend of his friend, or give any thought to them in comparison to this; for what is best is most choiceworthy, and doing well in action is best.

Perhaps what they say is true, if indeed the most choiceworthy thing there is will belong to those who commit robbery and use force. But presumably it cannot **$1325^{b}1$** belong to them, and this assumption is false. For his actions cannot yet be noble if the agent is not as superior [to those he rules] as a man is to a woman, a father to his children, or a master to his slaves. And so the transgressor can do nothing to later correct so great a previous deviation from virtue. For among those who are similar, the noble and the just thing is to take turns [in ruling and being ruled], for this is equal and similar treatment. But unequal shares for equal people or dissimilar ones for similar people is contrary to nature, and nothing contrary to nature is noble. That is why, when someone else is more excellent in virtue and in his practical capacity to do what is best, it is noble to follow him and it is just to obey him. But he must possess not virtue alone, but also the capacity in accord with which he will be a doer of action.

If the things that have been said are correct, and happiness is to counted as doing well in action, the best life, both for the whole city collectively and for each individual, would be a practical life.[274] Yet it is not necessary, as some suppose, for a practical life to be in relation to other people, nor are those thoughts alone practical that arise for the sake of the consequences of doing an action; much more practical are the acts of contemplation and thought that are their own ends and are engaged in for their own sake; for doing well in action is the end, and so action of a sort is the end too.

273. 1.4–7.

274. I.e., one focused on action.

And we say that, strictly speaking, the ones who above all do actions, even external actions, are the architectonic craftsmen who do them by means of their thoughts.

Moreover, it is not necessary for even those cities to be inactive that are situated by themselves and have deliberately chosen to live that way; for actions can take place even among their parts; for the parts of the city have many communal relations with each other. Similarly, this also holds of any individual human being; for otherwise the [primary] god and the entire cosmos could scarcely be in a noble condition, since they have no external actions beyond the [internal] ones that are proper to them.

It is evident, then, that the same life is necessarily best both for each human being and for cities and human beings collectively.

7.4
The Size of the Best City

Since what has just been said about these matters was by way of a preface, and since we got a theoretical grasp on the other constitutions previously, the starting-point for the remainder of our investigation is first to discuss the sorts of hypotheses there should be concerning the city that is going to be set up so as to be in accord with our prayers. For the best constitution cannot come into existence without commensurable resources. That is why many things should be hypothesized in advance, just as when praying, although none of them should be impossible. I mean, for example, the size of the citizenry and of the territory. For just as other craftsmen—for example, a weaver or a shipbuilder—must also be supplied with matter suitable for doing the work, and the better the matter has been prepared, the nobler what results from their craft must be, so too the proper matter that a politician and legislator are supplied with must be in a suitable condition.

First among the resources belonging to politics is a multitude of human beings, how many there should be of them, and of what quality they should be by nature. And likewise for the territory, how large it should be, and of what sort. Most people think that it is appropriate for a happy city to be a great one, but even if what they think is true, they are ignorant of the quality that makes a city great or small. For they judge a city to be great if the number of its inhabitants is large, while they should look not to number but to capacity. For a city too has a certain work, so that the city that is best able to complete it is the one that must be thought greatest. Similarly, one should say that Hippocrates is greater not as a human being but as a doctor than one who exceeds him in physical size.

Yet even if one should judge the greatness of a city by looking to the multitude, this must not be toward any random multitude (for perhaps of necessity there are a large number of slaves, resident aliens, and foreigners present in cities), but rather to those who are part of it—that is, who form the parts proper to a city, those of which it is composed; for possessing a superior number of these is the sign of a great city. A

city that can send a large number of unrefined people out to war, on the other hand, but only a few hoplites, cannot possibly be great; for a great city and a populous one are not the same.

And this too is, at any rate, evident from the facts, that it is difficult, perhaps impossible, for a city that is overly populous to be in good legislative order. Certainly, among those that seem to be governed in a good way, we see none being lax as regards the number. And this is also clear from trustworthy arguments. For law is a sort of order, and so good legislative order must be a [sort of] good order. But an overly large number cannot share in order; for that would be a work of a divine power, the sort that holds the universe together, since the noble, at any rate, is usually found in number and magnitude.[275] That is why that city is most noble where, together with magnitude, the defining mark that has been mentioned is also found.

But of the magnitude of a city there is a certain measure, just as in the case of everything else—animals, plants, and instruments; for in fact when each of them is neither overly small nor too excessively large, it will have its own capacity, but otherwise will either be wholly deprived of its nature or be in bad condition. For example, a ship that is one span long will not be a ship at all, nor will one of two stades, but, as it approaches a certain size, it will sail badly, in the one case because of its smallness, in the other because of its excessive size. **1326**^{b}**1**

Likewise also in the case of a city, one that is composed of too few people is not self-sufficient (while a city is something self-sufficient), but one that is composed of too many, while it is self-sufficient in the necessities, the way a nation is, is still no city; for it is not easy for it to have a constitution; for who will be the general of its excessively large multitude, and who, unless he has the voice of Stentor, will serve as its crier? That is why, while the first city must be the one composed of a multitude of the sort that is the first multitude large enough to be self-sufficient with a view to living well in accord with a political community, it is also possible for a city that exceeds this one in number to be a greater city, but, as we said, this is not possible indefinitely.

What the defining mark of this excess is can easily be seen from the facts; for a city's actions are either those of the rulers or those of the ruled. And a ruler's work is prescription and judgment. But with a view to judgments in suits and with a view to distributing offices in accord with worth, each citizen must know the other citizens, that is, know what sorts of people they are, since where they do not know this, matters regarding the electing of officials and judgments in suits must go badly. For to act in an offhanded way is unjust in both these proceedings. But this is manifestly precisely what occurs in an overly populous city.

Further, it is easy for resident aliens and foreigners to get a share in the constitution; for it is not difficult for them to escape notice because of the excessive size of the population.

275. *Po.* 1450^{b}34–37.

It is clear, therefore, that the best defining mark for a city is this: it is the greatest excess of multitude with a view to self-sufficiency in living that can be easily surveyed as a whole. Let the size of the city, then, be determined in this way.

7.5
Territory

Much the same also holds in the case of the territory. For, as regards the sort of territory, it is clear that everyone would praise the most self-sufficient (and such a territory must be all-producing; for self-sufficiency is having everything and needing nothing). In quantity or extent it should be large enough to enable the inhabitants to live at leisure in a way that is generous and at the same time temperate. But whether this defining mark is correctly or incorrectly stated is something that must be investigated with greater exactness later on,[276] when we come to make mention of possessions in general, what it is to be well-off as regards property, and how and in what way this is related to its use; for there are many disputes about this subject of investigation because of those who draw us toward either of the two extremes of life, the one lot toward tightfistedness, the other toward luxury.

The form of the territory is not difficult to describe (although on some points one should listen to those experienced in generalship): it must be difficult for enemies to invade and easy for the citizens themselves to get out of.[277] Further, just as the multitude of people should, as we said, be easy to survey as a whole, the same also holds of the territory, since for a territory to be easily surveyed as a whole is for it to be easily defended.

As for the position of the city, if it is to be made in accord with our prayers, it is appropriate for it to be well situated in relation both to the sea and to the surrounding territory. One defining mark was mentioned above: defensive troops must have access to all parts of the territory. The remaining defining mark is that the city should allow easy transportation with a view to the conveyance of collected crops, and materials for the wood market besides, and for doing any other work of this sort the territory happens to have.

7.6
Access to the Sea and Naval Power

As regards communication with the sea, there is much dispute about whether it is beneficial or harmful to cities that are in good legislative order; for it is said that entertaining foreigners as guests who have been brought up under different laws

276. Not in the extant *Politics*.
277. Aristotle seems to mean "easy to get out to." See 1327a6–7.

is detrimental to good legislative order, as is populousness, and that, as a result of their use of the sea for importing and exporting, a multitude of traders comes about, and this is contrary to being governed in a good way. But it is quite clear that, if these things do not come about, then it is better both with a view to safety and to ensuring a ready supply of necessities for a city and its territory to have access to the sea. For in fact with a view to withstanding war more easily people should be readily defensible both on land and sea if they are to preserve themselves. And with a view to inflicting harm on their attackers, if they are unable to do so on both, at least they will be in a better position to do so on one or the other, if they have access to both.

It is also necessary for cities both to import the things that are not available at home and to export those of which they have a surplus; for a city should engage in trade for itself, not for others, while those that open their market to everyone do so for the sake of revenue. But a city that must not be involved in this sort of getting more must not have a trade of this sort either.

Since, even as things stand, we see many territories and cities that have ports or harbors naturally well situated in relation to the city, so that they are neither parts of the same city proper nor too far away from it, but are kept under its control by walls and other similar defenses, it is evident that if any good comes from this sort of communication [with a port or harbor], it will be available to the city, while if there is anything harmful, it can be prevented by means of laws that specify or define the sorts of people that should or should not have dealings with each other.

As far as the naval force is concerned, it is quite clear that it is best to have up to a certain size (for a city should also be formidable on sea, exactly as it should be on land, able to aid not only itself but also some of its neighbors). But as regards the **1327b1** number and size of this force, one must look to the life of the city. For if it is going to live a life of leadership and a political life, it must also have a force of this sort that is commensurable with its actions.

It is not necessary for cities to suffer the populousness associated with a seafaring mob; for they should not be part of the city at all. For the force of marines is free and consists of infantry, and it is what has control and commands the ship. And if the city contains a multitude of subject peoples and farmers, there cannot be any shortage of sailors. We see this happening in certain cities even now—for example, in the city of Heraclea; for it can man many triremes, despite being more modest in number [of citizens] than many other cities.

As regards territory, harbors, cities, the sea, and naval force, then, let matters be determined in this way.

7.7
The Influences of Climate

We spoke previously[278] about what the defining mark is to be for the multitude of citizens. Let us now discuss of what sort they should be as regards their nature.

One may, then, pretty much understand what this is by looking at those Greek cities that are well reputed, and at the way the entire inhabited world is divided into nations. For the nations in cold regions, particularly in Europe, are full of spirit but somewhat deficient in thought and craft knowledge, which is why they remain comparatively free, but are without a political constitution and incapable of ruling their neighbors. Those in Asia, on the other hand, have souls endowed with thought and craft knowledge, but they lack spirit. That is why they remain in subjection and slavery.

The Greek race, however, occupies an intermediate position geographically, and likewise shares in both sets of characteristics. For it is both spirited and possessed of thought. That is why it remains free, governs itself in the best way, and is capable of ruling all, should it acquire one constitution. The same difference is also found among the Greek nations in relation to each other; for some have a nature that is one-sided, while in others both these capacities are well blended. It is evident, therefore, that as regards their nature people must be both spirited and possessed of thought, if they are to be easily led to virtue by the legislator.

For some say[279] that guardians should have precisely this quality, friendliness toward those they know and fierceness toward those they do not, and spirit is what produces friendliness; for it is the capacity of the soul that makes us disposed to love. A sign of this is that one's spirit is roused more against associates and friends than against strangers, when one regards oneself as being treated contemptuously. That is why, when Archilochus was complaining about his friends, it was appropriate for him to say to his spirit: "it is you who are choked with rage against your friends."[280] The element of ruling and the element of being free derive from this capacity in all cases; for spirit is both fitted for rule and indomitable. But it is not correct to claim that guardians are to be harsh to those they do not know; for one must not treat anyone in this way. Nor are great-souled people[281] by nature harsh, except to those behaving unjustly. And besides they feel this more toward intimates, precisely as was said previously, if they regard themselves as being treated unjustly. And it is reasonable that this should happen; for they suppose that in addition to being harmed they are deprived of the benefit they consider they are

278. 1326a5–b25.
279. Plato, *Republic* 375b–376c.
280. Fr. 78 Diehl.
281. *NE* 4.3.

owed. Hence the sayings: "Wars among brothers are harsh,"[282] and "Those who have loved excessively will hate excessively too."[283]

As regards the citizens, then, their number and of what sort they should be as regards their nature, and further, about the size and sort of the city's territory, pretty much enough has been determined (for one should not seek the same exactness in accounts as in what comes through perception).

7.8
Necessary Parts of the City

Since, as in the case of the other things that are composed in accord with nature, those things without which the whole cannot exist are not parts of the whole composite, clearly the things that are necessary for the existence of a city must not be counted as parts of it either, and likewise for any other community from which something one in kind is composed (for communities should have some one thing that is common and the same for all the members, whether they share in it equally or unequally)—for example, nourishment, an expanse of territory, or something else of this sort.

But whenever one thing is for the sake of another and the other is that for whose sake it is, they have nothing in common except that one produces and the other gets produced. I mean, for example, the relationship of every instrument and craftsman to the work produced; for there is nothing that is common to the house and the builder, but rather the builder's craft knowledge is for the sake of the house. That is why, though cities need property, property constitutes no part of a city—although among the parts of property are many animate things. But a city is a community of similar people, and exists for the sake of a life that is the best possible.

Since the best thing is happiness, however, and it is some sort of activation or complete use of virtue,[284] and since, as it happens, some people are able to share in happiness, while others are able to do so only to a small degree or not at all, it is clear that this is a cause of there being many forms of city and many different constitutions; for by pursuing this in different ways and by different means each group of people produces different ways of life and different constitutions. **1328b1**

But one must also investigate the question of how many of these things there are that a city cannot exist without; for in fact what we are calling the "parts" of a city would of necessity be included among them. So one must first grasp the number of works there are; for this will make the answer clear. First, there should be a supply of nourishment. Second, crafts (for living needs many instruments). Third, weapons (for the members of the community must also have weapons of their own, both in order to rule, since there are people who disobey, and in order to deal with outsiders

282. Euripides, Fr. 975 Nauck.
283. 854 Fr. 67b Nauck (author unknown).
284. *NE* 1098a15–20.

who attempt to do injustice). Further, a ready supply of wealth, both for their needs among themselves and for military needs. Fifth, but of primary importance, the supervision of religious matters, which is called a "priesthood." Sixth, and most necessary of all, judgment about what is advantageous and just in their relations with each other.

These, then, are the works needed in (one might almost say) every city (for a city is not just any random multitude, but one that is self-sufficient with a view to living, as we say, and if any of these works is lacking, a community cannot be unconditionally self-sufficient). It is necessary, therefore, for a city to be set up in accord with doing these sorts of work. There must, therefore, be a multitude of farmers to provide the nourishment; and craftsmen; and a fighting element; and a rich element; and priests; and judges of what is necessary and advantageous.

7.9
Offices and Who Should Hold Them

Having determined these matters, it remains to investigate whether all these works must be shared by all (for it is possible for all the same people to be farmers and craftsmen and deliberators and judges), or whether distinct people must be assigned to each of the works mentioned, or whether, of necessity, some of these are specialized, while others are common. It is not the same in every constitution. For it is possible, as we said,[285] for everyone to share in all, or for not everyone to share in all, but certain people in certain ones. For these things also make constitutions distinct; for in democracies everyone shares in everything, while in oligarchies it is the contrary.

Since we are investigating the best constitution, however, the one in accord with which a city would be most happy, and happiness cannot exist separate from virtue, as was said previously,[286] it manifestly follows that in a city governed in the best way, possessing men who are unconditionally—not relative to a hypothesis—just, the citizens should not live either an unrefined or a trading life (for lives of these sorts are ignoble and entirely contrary to virtue). Nor should those who are going to be
1329a1 citizens be farmers (for leisure is needed both for the development of virtue and for political actions).

But since the best city contains both a military part and one that deliberates about what is advantageous and renders judgment about what is just, and since it is evident that these are most of all parts of the city, must these works also be counted as distinct,[287] or must both be assigned to the same people? [The answer to] this is evident too, because in one way the works must be assigned to the same people and in another way to distinct ones. For insofar as the prime time for each of the two

285. 1328b24–28.
286. 1323b29–36, 1328a37–b2.
287. Rejecting the addition of ἑτέροις.

works is different, in that one requires practical wisdom and the other strength, they must be assigned to different people. On the other hand, insofar as it is impossible for those capable of using and resisting force to tolerate being always ruled, to that extent they must be assigned to the same people. For those who control the weapons also control whether a constitution will endure or not.

The only course remaining, therefore, is for the constitution to assign both works to the same people, but not at the same time. Instead, just as it is natural for strength to be found among younger men and practical wisdom among older ones, so it is advantageous and just to assign the works to each group in this way; for this division is in accord with worth.

Moreover, the property too should be in their hands. For it is necessary for the citizens to be well supplied with resources, and these people are the citizens. For the unrefined element does not share in the city, nor does any other kind that is not a craftsman of virtue. This is clear from our hypothesis; for happiness necessarily involves virtue, and a city must not be called "happy" by looking at just a part of it, but by looking at all the citizens. It is also evident that the property should be theirs, if indeed the farmers must be slaves, either barbarians or[288] subject peoples.

Among the things enumerated previously,[289] then, only the kind consisting of the priests remains. The order of these is also evident. For no farmer or unrefined person must be appointed as a priest (for it is appropriate for the gods to be honored by citizens). But because the political element is divided into two parts, the military and the deliberative, and because it is appropriate for those who are worn out with age to render service to the gods and find rest, it is to these that priesthoods must be assigned.

The things without which a city cannot be composed, and how many parts of a city there are, have now been stated. For while the farmers, the craftsmen, and the laboring element generally are necessary for the existence of cities, the parts of a city are the military part and the deliberative part. And each of these is separate from the others, some permanently, others by turns.

7.10
The Division of the Territory

It seems to be recognized among those who philosophize about constitutions—and not just nowadays or in recent times—that a city should be divided into separate kinds, and that the military element should be distinct from the farming element. For **1329**[b]**1** it is still this way even now in Egypt, and also in Crete—Sesostris having made such a law for Egypt, so it is said, and Minos for Crete.

288. Rejecting the seclusion of ἢ.
289. 1328[b]2–23.

Communal messes also seem to be an ancient order, having arisen in Crete during the reign of Minos, but those in Italy are much older. For the chroniclers say that one of those who settled there, a certain Italus, became king Oenotria, and that on account of him they changed their name and were called "Italians" instead of "Oenotrians," and the promontory of Europe that lies between the Gulfs of Scylletium and Lametius (which are a half-day's journey apart) was given the name of "Italy." It was Italus, they say, who made the nomadic Oenotrians into farmers, and along with enacting other laws for them, first introduced communal messes. That is why some of those descended from him still make use of communal messes even today, as well as of some of his laws. The ones who lived near Tyrrhenia were the Opicians, who were then (as now) called "Ausonians." The ones living near Iapygia and the Ionian Gulf, in a region called "Siritis," were the Chonians, who were related to the Oenotrians by race. So it was in this region that communal messes were first organized.

The separation of the multitude of citizens according to kind, on the other hand, originated in Egypt; for the kingship of Sesostris extends much further back in time than that of Minos. One should consider, indeed, that pretty much everything else too has been discovered many times—or, rather, an unlimited number of times—in the long course of history.[290] For our needs themselves are likely to teach the necessities, and once they are present, the things that contribute to refinement and abundance reasonably develop. So as regards what pertains to constitutions too, one should think that things hold in the same way.

That all such matters are ancient the facts about Egypt are a sign; for the Egyptians seem to be the most ancient of peoples, yet they[291] possessed laws and political order. That is why one should make adequate use of what has been discovered, but also try to inquire about whatever has been overlooked.

That the territory should belong to those who possess weapons and share in the constitution was stated previously,[292] and why those doing the farming should be distinct from these, and how much territory there must be and of what sort. But the distribution of land, who the farmers should be, and what sort of people they must be, must be spoken about first, since we say[293] that property should neither be held communally, as some have claimed[294]—but it should be communal in its use, as it is among friends—nor yet should any citizen be without nourishment.

As for communal messes, everyone agrees that it is useful for well-established cities to have them (what the cause is of our agreeing with this will be stated later on[295]). All the citizens should share in these, even though it is not easy for the poor to contribute the required amount from their private resources and manage the rest

290. *Met.* 1074b11–12.
291. Rejecting the addition of ἀεὶ ("always").
292. 1329a17–26.
293. 2.5.
294. 1261a4–8.
295. Not in the extant *Politics*.

of their household as well. Further, expenses relating to the gods should be shared communally by the entire city.

It is necessary, therefore, for the territory to be divided into two parts, one communal and the other belonging to private individuals. And each of these must again be divided in two. One part of the communal land should be used to support public services to the gods, the other for expenditure on the communal messes, while one part of the private land should be located near the frontiers, the other near the city, so that, with two allotments assigned to each citizen, all of them may share in both locations. For this is in accord with justice and equality and also ensures greater concord in the face of wars with neighbors. For wherever things are not this way, some citizens neglect feuds with bordering cities, while others, contrary to what is noble, give too much thought to them. That is why some cities have a law that prohibits those who dwell close to the border from sharing in deliberations about whether to go to war with neighboring peoples, on the supposition that because of their private interest they are incapable of deliberating in a noble way. It is necessary, then, for the land to be divided in this way, due to the causes mentioned.

As for those who do the farming, it is above all necessary—if the matter is to be in accord with our prayers—that they be slaves, who neither belong to the same race nor to spirited ones (for that way they will be useful as regards doing work, and safe as regards not stirring up change). As a second best, they should be barbarian subject peoples, much the same in nature to those just mentioned. Among these, the ones who work on private land should be private to those who possess property, while those who work on the communal land should be communal. The way slaves should be treated, and why it is better to hold out freedom as a reward to all slaves, we will speak about later on.[296]

7.11
Location and Fortifications

That a city should have as much access to the land and to the sea, and likewise to its entire territory, as is possible was stated previously.[297] As regards its own situation, one should pray to be successful in getting a site for it,[298] looking to four things. The first is health, because it is a necessity (for cities that slope toward the east, that is, toward the winds that blow from the direction of the rising sun, are healthier). Second healthiest are those that slope away from the north wind; for they have milder winters.

One of the remaining things to keep in view is that the city should be well situated for political and military actions. With a view to military ones, the city must be easy **$1330^{b}1$**

296. Not in the extant *Politics*.
297. $1327^{a}3–10$, $1327^{a}11–40$.
298. Reading πρὸς αὐτὴν τὴν θέσιν εὔχεσθαι δεῖ κατατυγχάνειν.

for the citizens themselves to get out of but difficult for their enemies to approach and blockade. It must also possess a plentiful water supply of its own, especially springs. But if it does not, a way has been discovered to construct bounteous large receptacles for rainwater to prevent the supply from running short when the citizens are kept away from the countryside by war.

One must give thought to the health of the inhabitants, and this depends on the location being well situated in territory of this sort and facing in this direction, and second, on using healthy water, and making this concern more than a side issue. For the things we use in the greatest quantity and most frequently for our bodies contribute most to health. And the capacity of water and air has a nature of this sort. That is why in all well-thought-out cities, if it happens that all the springs are not equally healthy or if the healthy ones are not abundant, one should distinguish and keep separate those for nourishment and those for other uses.

As regards fortified places, what is advantageous is not the same for all constitutions. For example, an acropolis is oligarchic or monarchical, a level-ground fortification is democratic, and neither of these, but rather a number of strongholds, is aristocratic.

As regards the disposition of private dwellings, the new Hippodamean way[299] of laying them out in straight rows is considered pleasanter and more useful for other actions, but for safety in war the contrary one, which prevailed in ancient times, is more useful; for it makes it difficult for foreign troops to enter and for attackers to find their way around. That is why the best city should share in both of these. This is possible in fact if one establishes it in the way that farmers make "vine clumps"[300] (as some farmers call them), that is, if the city as a whole is not made in straight rows, but only parts and places; for in this way things will be well done regarding both safety and beauty.

As for walls, those people[301] who say that cities that lay claim to virtue should not have them are too archaic in their suppositions about things—and this though they see cities that prided themselves in this way refuted by the facts. It is true that against those who are similar to ourselves and not very superior in numbers it is not noble to seek preservation through fortifying walls. But it can and does happen that the superiority of the attackers is too much for human virtue or for the virtue of a small number of people. So, if one is to preserve oneself and not suffer ill-treatment or wanton aggression, one must think that the safest fortification provided by walls is
1331a1 most appropriate for war—particularly in light of recent discoveries about projectiles and engines for improved precision in sieges. For to think it is required for cities not to build surrounding walls is like seeking to make the territory easy to invade and

299. That designed by Hippodamus of Miletus (2.8).
300. Laid out like the five spots on a die.
301. Plato, *Laws* 778d–779b.

mountainous places removed, and like not building walls around private houses on the grounds that they will make the inhabitants cowardly.

Further, one should not overlook either the fact that it is open to the inhabitants of cities with surrounding walls to treat them in both ways, as having walls or as not having them, while this is not open to the inhabitants of a city without walls. If, then, this is the way things stand, a city must not only have surrounding walls, but must also take care to ensure that they are properly constructed in regard to both the beauty of the city and military needs, as well as others, and, in particular, those brought to light by recent discoveries. For just as attackers are always busily concerned with new ways to get more [of the upper hand], so too, while defenders have already discovered some things, they should seek and devise others; for no one even attempts to attack those who are well prepared from the start.

7.12
Markets, Temples, and Communal Messes

Since the multitude of citizens should be divided in groups for communal messes, and the walls should have guardhouses at intervals, and towers in suitable places, these things clearly suggest that some communal messes should be provided in these guardhouses. That, then, is the way one might arrange these.

As for the buildings assigned to the gods, and the communal messes for officials with the most control, it is appropriate for them to be located both in a fitting place and in the same one—except in the case of temples assigned a separate location by the law or some other prophecy delivered by the Pythian god.[302] And a place like this would be one that is such as to be a conspicuous enough setting for virtue[303] and also better fortified than the neighboring parts of the city.

Below this site, it is fitting to set up a marketplace of the sort they call by that name[304] in Thessaly—the one they call "free." This is one that should be kept clear of all merchandise, and that no unrefined person, farmer, or anyone of that sort may come near unless summoned by the officials. The place would have added appeal if there was also an order of the gymnasia for the older men there; for it is appropriate for this order to be divided into age groups, and to have some of the officials spend their time with the younger men, and have the older men spend time with the officials; for being present in the eyes of the officials is what most engenders true shame, and the sort of fear characteristic of free people.

The marketplace for merchandise, by contrast, should be distinct from this free one, and should have a separate site, conveniently located for collecting together all the things sent in from both land and sea. **1331b1**

302. Apollo.
303. Reading τὴν ἀρετῆς θέσιν.
304. Reading ὀνομάζουσιν.

Since the city's pre-eminent element is divided into priests and officials, it is appropriate too for the order of the communal messes of the priests to be located in the vicinity of the sacred buildings.

As for the boards of officials that are made to supervise contracts, legal accusations, summonses, and other administrative matters of that sort, as well as those that deal with marketplace management and so-called city management, one should establish their seat near the marketplace and in some public meeting place, and the area around the necessary marketplace is of this sort; for the upper marketplace is intended for being at leisure, the lower, for necessary actions.

The order that has just been mentioned must also be imitated[305] in matters pertaining to the countryside; for there too the officials that some call "foresters" and others "country managers" must have messes and guardhouses for the purposes of keeping guard on things. Further, temples must be distributed throughout the territory, some dedicated to gods and others to heroes.

It would be pointless, however, to spend time now in giving an exact account and speaking about things of this sort; for they are not difficult to understand, but difficult to do; for speaking about them is a work of prayer, while having them come about is a work of luck. That is why anything further concerning such matters must now be left aside.

7.13
Happiness and Virtue

The constitution itself, and of which and of what sorts of people the city that is going to be blessedly happy and govern itself in a good way should be composed, must now be spoke about.

There are two things in which well-being consists in all cases: one of these is setting up the target and end of action correctly, the other is discovering the actions that carry us toward it (for it is possible for these either to clash with each other or to be in harmony; for sometimes the target is well set up, but people make an error in what they do to hit it, sometimes they achieve everything that furthers the end, but the end they set up is a base one, and sometimes they make both errors, as in connection with medicine, for example; for sometimes they neither make a correct judgment about what sort of condition a healthy body should be in nor hit upon the things that are productive in furthering the defining mark they set before themselves). But in the crafts and sciences both of these must be mastered, the end and the actions that are toward the end.

It is evident that everyone aims at living well and at happiness. But while it is possible for some to achieve these ends, it is not open to others, either because of

305. Reading μεμιμῆσθαι.

some stroke of luck or because of nature (for living in a noble way also needs certain supplies, although fewer are needed by those in a better condition, more by those in **1332ᵃ1**
a worse one). But others straightaway seek happiness in an incorrect way, although it is possible for them to achieve it.

Since what we are proposing to do is to look at the best constitution, however, and it is the one in accord with which a city will be governed in the best way, and it would be best governed in accord with a constitution that would make it most possible for 5
the city to be happy, it is clear that one should not overlook what happiness is. And we say—and have given this definition in our ethical studies[306] (if anything in those discussions is of benefit)—that it is a complete activation and use of virtue, and this not on the basis of a hypothesis but unconditionally. By "on the basis of a hypothesis" I mean the necessary ones; by "unconditionally" I mean what is nobly [done]. For 10
in the case of just actions, for example, just revenge and punishments spring from virtue, but are necessary, and nobly [done] has [the quality of] necessarily done (for it is a more choiceworthy situation if no man or city needs any such things). By contrast, just actions that aim at honors and prosperity are unconditionally noblest. 15
For the former involve choosing[307] something bad, while the latter are the contrary; for they establish and generate good things.

An excellent man would use poverty, disease, and other sorts of bad luck in a noble way, but blessedness lies in their contraries (for in accord with the definition in our 20
ethical accounts in fact, an excellent man is the sort for whom, because of his virtue, the good things are the unconditionally good ones, so it is clear that his use of them must also be unconditionally excellent and noble). That is why people consider the 25
causes of happiness to be external goods—as if a lyre rather than craft knowledge were taken to be the cause of brilliant and noble lyre playing.

It follows, therefore, from what has been said, that some things must be there to start with, while others must be established by the legislator. That is why we pray for the composition of the city to be successful[308] concerning the things that luck controls (for we take it that luck does control them). 30

The city's being excellent, however, is no longer a work of luck but of scientific knowledge and deliberate choice. But surely a city, at any rate, is excellent by its citizens—those who share in the constitution—being excellent. And in our city all the citizens share in the constitution. This, therefore, must be investigated, how a man becomes excellent. For even if it is possible for all to be excellent [collectively] 35
without each citizen being so individually, the latter is still more choiceworthy; for if each individually is excellent, it follows that all are.

But surely people become good or excellent because of three things. These three are nature, habit, and reason. For in fact one must be born, first of all, a human being, 40

306. Not in the extant ones.
307. Reading αἵρεσίς.
308. Reading διὸ κατατυχεῖν εὐχόμεθα τὴν τῆς πόλεως σύστασιν.

and not one of the other animals. Similarly, one's body and soul must be of a certain quality. But in the case of some qualities, being born with them is of no benefit,
1332b1 because habits make them change; for some qualities, because of their nature, play a double game, going toward the worse or toward the better because of one's habits. But, while the other animals mostly live by nature alone, while to a small extent some also do so by habit, the human being lives by reason as well; for he alone has
5 reason. So these [three] must harmonize with each other. For people do many actions contrary to their habits and their nature because of reason, if they are persuaded that some other way is better.

We determined previously[309] what sort of nature people should have if they are going to be easily handled by the legislator. What is left at this point is a work of
10 education. For some things are learned by habituation and others by listening.

7.14
Rulers and Ruled: Their Education

Since every political community is composed of rulers and ruled, this issue must be investigated, whether distinct people should be rulers and ruled or whether the same
15 ones should be both throughout life; for clearly their education must follow along with these alternatives.

If they differed from each other as much as gods and heroes are believed to differ from human beings—straightaway having a great superiority first in body and then in soul, so that superiority of the rulers in comparison to those ruled was indisputable
20 and evident—it would clearly be altogether better if the same people always ruled and the others were always ruled. But since this is not easy to achieve, and since there are not, as Scylax says there are in India, kings who are so greatly superior to the
25 ruled, it is evident, due to many different causes, that it is necessary for all to share alike in ruling and being ruled in turn. For, in the case of those who are alike, equal is what is the same, and it is difficult for a constitution to endure if it is set up contrary to justice. For along with the ruled there are all those in the surrounding territory
30 who wish to stir up change, and one of the impossible things is that those in the governing body be numerous enough to be stronger than all these.

On the other hand, that the rulers, at any rate, should be different from the ruled is indisputable. Hence the legislator should investigate the question of how this is to be achieved, and how they should share with each other. This was spoken about
35 previously.[310] For nature has provided the distinction[311] by itself making part of the same kind younger and part older, the former fitted to be ruled and the latter to rule; and no one resents being ruled in accord with his age, or considers himself superior,

309. 1327b18–38.
310. 1329a2–17.
311. Reading διαίρεσιν.

especially when he is going to be compensated for his contribution when he reaches the proper age.

It must be affirmed, therefore, that rulers and ruled are in one way the same, in another way distinct. So their education too must be in one way the same, in another way distinct. For if someone is going to rule well, they say, he must first **1333ᵃ1** have been ruled.

But rule, as was said in our first accounts,[312] is either for the sake of the ruler or for the sake of the ruled. Among these, we say that the former is the rule of a master, the latter rule over free people. In some cases the things prescribed differ not with respect to the works they prescribe but with respect to that for the sake of which they are to be done. That is why it is noble even for free young men to perform many of the works that are believed to be appropriate for slaves. For, as regards the noble and the not noble, the difference does not lie so much in the actions themselves as in their ends and what they are for the sake of. Since we say that the virtue of a citizen and a ruler is the same as that of the best man, and that the same man should be ruled first and rule later, the legislator would have to make it his business to determine how and through what practices men become good, and what the end of the best way of living is.

The soul is divided into two parts, one of which has reason intrinsically, while the other does not have it intrinsically, but is capable of listening to it. It is in accord with the virtues of these, we say, that a man is said in a way to be good. As to whether the end lies in one of these more than the other, to those who make the same distinction as the one we mentioned it is not unclear what must be said. For the worse part is always for the sake of the better, and this is as evident in the products of the crafts as it is in those of nature. But the part that has reason is better. And it, in the way that we are accustomed to divide it,[313] is divided into two; for, on the one hand, there is practical reason, and, on the other, theoretical reason. So it is clear that the rational part of the soul must also be divided in the same way. Actions too, we will say, are divided proportionally, and those that belong to the part that is by nature better must be more choiceworthy to anyone who can succeed in doing all [three] or only two of them; for this is always what is most choiceworthy for each individual, the topmost [good] it can attain.

The whole of life too, however, is divided into unleisure and leisure, war and peace, and of things doable in action some are necessary or useful, others noble. And as regards these things, it is necessary to make the same choice as in the case of the parts of the soul and their actions. War must be for the sake of peace, unleisure for the sake of leisure, necessary and useful things for the sake of noble ones.

The politician must legislate, therefore, looking to all these things in a way that is in accord with the parts of the soul and their actions, but more to those that are

312. 1277ᵃ33–ᵇ16, 1278ᵇ30–1279ᵃ21.
313. *NE* 1139ᵃ3–15.

better and those that are ends. And he should legislate in the same way as regards lives and as regards the divisions[314] of actions. For one should be able to be unleisured or to go to war, but more able to sustain peace and leisure, and one should be able to do necessary and useful actions, but noble ones more so. So these are the targets that should be kept in view when educating citizens, both when they are still children and at any other age they need education.

It is evident, however, that those Greeks who are now believed to be governed in the best way, and those legislators who set up their constitutions, neither ordered the various aspects of their constitutions with a view to the best end nor their laws and education with a view to all the virtues, but instead were unrefinedly inclined toward the ones believed to be useful and more conducive to getting more.

Some later writers have expressed the same belief in much the same way as this; for they praise the Spartan constitution and admire the target of its legislator, because he legislated on all matters with a view to conquest and with a view to war. And what they say is easy to refute by argument, and has now been refuted by the facts too. For just as most human beings are eager to rule as masters over many, because this provides them with a ready supply of the goods of luck, so too Thibron manifestly admires the Spartan legislator, as do each of the others who have written about their constitution, because by being trained to dangers, they ruled over many. And yet it is clear—now, at any rate, that their empire is no longer in their hands—that the Spartans are not happy, and that their legislator is not a good one.

Further, this is ridiculous: while keeping to his laws, and there being no impediment to making use of them, they lost their noble way of living. Neither are they correct in their supposition about the sort of rule a legislator should be seen to honor; for rule over free people is nobler and more involves virtue than rule of a master. Further, one should not consider a city happy or praise its legislator because he trained it to exercise power for the purposes of ruling its neighbors; for such things involve great harm. For it is clear that [on the same supposition] any individual citizen who is able must attempt to acquire the power to rule his own city. Yet this is precisely what the Spartans accused their king, Pausanias, of doing, even though he held so high an office.

There is, then, nothing properly political in these sorts of arguments and laws, nor anything beneficial or true. For the same things are best both individually and communally, and it is these that a legislator should produce in the souls of human beings. Military training should not be attended to for the sake of reducing those who are not worthy of it to slavery, but rather, first, in order that the trained ones themselves not be enslaved to others, second, to pursue a position of leadership in order to benefit the ruled, not to be masters of all of them, and, third, to be masters of those who are worthy of being slaves.

314. Reading διαιρέσεις.

That the legislator must give more serious attention to how legislation about matter of war and other matters may be ordered for the sake of leisure and peace, the events testify on behalf of the arguments. For most cities of this sort are preserved while they are at war, but are destroyed once they acquire rule. For they lose their edge, just as iron does, when they remain at peace. But the one responsible is the legislator, who did not educate them to be capable of being at leisure.

7.15
Education and Leisure

Since the end is manifestly the same for human beings both communally and individually, and since it is necessary for there to be the same defining mark for the best man and for the best constitution, it is evident that the virtues for leisure must be present; for, as has often been said,[315] the end of war is peace, and that of unleisure is leisure. But the virtues useful with a view to leisure and passing the time include both those whose work lies in leisure and those whose work lies in unleisure. For many necessities must be present in order for being at leisure to be possible. That is why temperance is appropriate for our city as are courage and resilience; for, as the proverb says, there is no leisure for slaves, and those who are incapable of facing danger courageously are the slaves of their attackers.

Courage and resilience are for unleisure, philosophy for leisure, and temperance and justice are useful during both, and particularly when people remain at peace and are at leisure; for war compels people to be just and temperate, but the enjoyment of good luck and the leisure that accompanies peace make them wantonly aggressive instead. Much justice and temperance are needed,[316] therefore, by those who seem to do best and who enjoy all the things regarded as blessings—people like those, if there are any, as the poets say there are, who live in the Isles of the Blessed; for these above all will need philosophy, temperance, and justice, to the extent that they are at leisure amid an abundance of such goods.

It is evident, then, why a city that is going to be happy and excellent should share in these virtues. For it is shameful to be incapable of making use of good things, but it is even more shameful to be incapable of making use of them in leisure—to appear to be good when being unleisured or when at war, but slavish when at peace and leisure. That is why one must not cultivate virtue as the city of the Spartans does. For the Spartans are not different from the others in this way, in not considering the same things as they do to be the greatest goods for them and for the others, but in **1334b1** considering that these are brought about particularly by means of a certain virtue. But since they take these goods and the enjoyment of them to be greater than that of

315. Most recently at 1333a35–36.
316. Rejecting the addition of μετέχειν.

the virtues {. . .}[317] and that [virtue is choiceworthy?] because of itself is evident from these considerations. What must be theoretically grasped, then, is how and through what means this will come about.

We made a distinction previously,[318] then, to the effect that nature, habit, and reason are needed. And of these, what sort the citizens must be as regards their nature was determined previously.[319] It remains to get a theoretical grasp on whether they are to be educated by means of reason first or by means of habits. For these must harmonize with each other, and the harmony must be the best one; for it is possible for reason to be in error about the best hypothesis, and for us to be led in the same direction because of habits.

This, then, is evident, at any rate. First, just as in other cases, coming to be proceeds from a starting-point, and the end that proceeds from a certain starting-point is starting-point for another end. But reason and understanding are our nature's end, and so it is to further these that the coming to be and the training of our habits should be established. Second, just as soul and body are two, so we see that the soul has two parts as well: the non-rational and the one that has reason. And the states of these are also two in number, one of which is desire and the other understanding. And just as the coming to be of the body is prior to that of the soul, so the non-rational part is prior to the rational. This too is evident; for spirit and wish, and appetite besides, are present in children straight from birth, while rational calculation and understanding are made by nature to arise as they grow. That is why supervision of the body must come first, prior to that of the soul, and then supervision of desire, but supervision of desire must be for the sake of the understanding, and that of the body for the sake of the soul.

7.16
Regulation of Marriage and Procreation

If indeed, then, the legislator should see to it from the start that the bodies of children being reared are to develop in the best possible way, he must first supervise the union of the sexes, that is, when, and between what sorts of people, a marital relationship should be brought about. In legislating for this marital community, he should look both to the people involved and to their time of life, so that they will reach the same stage of life at the same time and there be no dissonance between their capacities, the

317. There seem to be lacunae in the mss. What is missing is probably something like this: But since they consider these goods and the enjoyment of them to be greater goods than the enjoyment (or use) of the virtues, they train only in the sort of virtue that is useful in war, while that they should also train in the sort that is useful in peace and that they should do so because of itself is evident from the foregoing considerations.

318. 1332a35–b8.

319. 1327b18–38.

man still being capable of procreating but the woman not, or the woman capable and the man not (for these things produce conflicts and disagreements among them).

Next, he should also look to the succession of children, for children should not be too far removed in age from their fathers (for the gratitude of children is of no use to more elderly fathers, and the help of such fathers is of no use to their children), neither should they be too close in age (for this leads to many annoyances; for there is less respect in cases of this sort, just as among contemporaries, and the closeness in age is liable to cause disputes over the management of the household).

Further, to return to the point with which we started our discussion, the legislator should look to how the bodies of those who are born are to be in congruence with his wish.

Pretty much all these things come about by supervising one thing. For since it has been determined that men's fertility, to speak of the majority of cases, comes to an end at a maximum age of seventy, and women's at fifty, the starting-point of their sexual union in terms of their ages should be such that it reaches its decline at these times.

The coupling of young people, however, is a bad thing with a view to procreation; for in all animals the young are more likely to bear offspring that are incomplete, and they are more likely to give birth to offspring that are female and small in size, so that the same must occur in human beings as well. The following is a proof of this. In all those cities in which the coupling of young men with young women is the custom, people are incomplete and undersized as regards their bodies.

Further, young women have longer labors, and more of them die in childbirth. That is why some people say that this is the cause of the oracle[320] that was given to the Troezenians, that many were dying because of the marrying off of younger women, not anything relating to the harvesting of the crops.

Further, with regard to temperance, it is advantageous for women to be given in marriage when they are older; for women who have had sex when they were young are believed to be more intemperate. Also, the bodies of males seem to be harmed with respect to their growth, if they have intercourse while their body[321] is still growing; for this growth too takes a definite period of time, after which it is no longer extensive.[322] That is why it is fitting for the women to marry when they are around eighteen years of age, the men when they are thirty-seven, or a little before.[323] For at such an age sexual union will occur when their bodies are in their prime, and, with respect to the cessation of their capacity to procreate, they will also decline together at the appointed times. Further, as to the succession of children, it will occur for them when they are starting their prime, if the birth takes place soon after the marriage, as

320. It allegedly said, "Do not plow the young furrow."
321. Reading σώματος.
322. Rejecting the transposition of ἢ μικρόν ("or is small").
323. Reading ἢ μικρόν <πρότερον>.

can reasonably be expected, while for their fathers it will occur when these are already at the age of their decline, toward the seventieth year.

When copulation should occur, then, has been stated. As for the season, however, one should use the time many people use, since they now correctly set aside the winter as the time to begin this sort of living together as husband and wife. In addition, couples should observe for themselves what is said about procreation by doctors and natural scientists; for doctors have adequately discussed the times that are opportune as regards the body, and natural scientists have discussed the winds, favoring northerly winds over southerly ones.[324]

As to what qualities their bodies should have if they are to be most beneficial to the offspring, it must be spoken about at greater length in our discussion of the supervision of children.[325] It is sufficient to speak of it in outline now. For the [physical] state characteristic of athletes is not useful either with a view to the good state of a citizen or with a view to health or procreation, nor is one that is too reliant on medical treatment and poorly suited to physical exertion. But the state that is in a mean between these two is useful for these purposes. One should, then, have a state that is achieved by physical exertion, but not by violent physical exertion, and that furthers not just one thing, as the state characteristic of athletes does, but rather the actions of free people. And these things should be present in men and women alike.

Even pregnant women must take care of their bodies and not idle or adopt a meager diet. The legislator can easily accomplish this by requiring them to take a walk every day in order to worship the gods whose assigned prerogative is to watch over birth.[326] But with regard to their thought, as opposed to their bodies, it is fitting for them to spend their time more idly; for unborn children manifestly draw resources from their mothers, just as plants do from the earth.

As regards the question of whether to expose offspring or rear them, let there be a law that no disabled one is to be reared, but that offspring not be exposed because of the number of children, if[327] the way the customs are ordered prohibits the exposure of offspring once they are born. The quantity of procreation should be defined, and if some children are conceived by some of those who have intercourse contrary to this, an abortion should be induced before the onset of perception and life; for what is pious and what is not will be determined by perception and life.

Since the starting-point of the age at which men and women must start their copulation has been determined, it must also be determined for how long a time it is fitting for them to render public service by procreating. For the offspring of parents who are too old, like those of parents who are too young, are incomplete in both body and in thought, while those of people who have reached old age are weak. That is why [the length of the time in question should be in accord with the time] when thought

324. *GA* 766b34–767a1, Plato, *Laws* 747d–e.
325. Not in the extant *Politics*.
326. E.g., Artemis and Eileithuia.
327. Reading ἐάν.

is in its prime. In most cases, this occurs—as some of the poets who measure age in periods of seven years have said—around the time of the fiftieth year. So when they have exceeded this age by four or five years they should be released from bringing children into the light of day. If they have intercourse after that, it should be evident that it is for the sake of health, or due to some other cause of this sort.

As for intercourse with another man or another woman, let it be unconditionally not noble to appear to be engaging in it in any way with anyone, when one is a husband[328] and referred to as such. If someone is seen doing anything of this sort during his period of procreation, let him be punished with dishonor appropriate to his error. **1336ᵃ1**

7.17
Education of Children

It should be recognized that the sort of nourishment that children are given once they are born makes a great difference to the strength of their bodies. And it is evident to anyone who investigates the other animals or those nations concerned to cultivate a military disposition that the nourishment that is particularly suited to [children's] bodies has a lot of milk in it but very little wine, because of the diseases [it produces]. Further, it is also advantageous for them to make whatever movements are possible at that age. But to prevent curvature of the limbs, due to softness, there are certain mechanical instruments,[329] which some nations employ even today, to make their bodies straight. It is also advantageous to habituate them to the cold right from the time they are small children; for this is very useful both with a view to health and with a view to military actions. That is why many barbarian nations have the custom of submerging newborn children in a cold river, while many others—for example, the Celts—dress them in light clothing. For in all cases in which it is possible to habituate, it is better to habituate right from the start, but to do so gradually. And because their bodily condition is hot, children are naturally well suited to being trained to bear the cold.

In the first stage of life, then, it is advantageous to adopt this sort of supervision as well as any that are much the same as it. During the following stage, which lasts until five years of age, it is not a good idea to have children engage in any sort of learning or any necessary physical exertion, lest it impede their growth. But they should engage in as much movement as will prevent laziness of the body, and this must be provided for them both through various activities and through play. But the games they play should not be either unfree, or exerting, or undisciplined.

As for the sort of stories and fables that children of this age should listen to, let this be the concern of the officials who are called "child supervisors." For all things of this

328. Rejecting the addition of ἀνὴρ.
329. The precise nature of these is unknown.

sort should pave the way for their later pursuits. That is why many of the games they play should imitate the things they will give serious attention to later on.

Those in the *Laws*[330] who prevent children from screaming and crying are wrong to prohibit things of this sort; for they contribute to growth; for they are in a way an exercise for the body; for holding the breath produces strength in those who are exerting themselves, and this is what happens in children when they exert themselves in screaming.

The child supervisors must investigate the way children pass the time, particularly to ensure that they are as little as possible in the company of slaves. For at this age, and until they are seven years old, it is necessary for them to be reared in their households. So it is quite reasonable to expect that they will pick up an element of unfreedom from what they see and hear even at that early age.

The legislator should in general banish shameful language from the city, as he would any other shameful thing (for by speaking lightly of whatever is shameful one comes closer to doing it too). He should above all banish it from among children, so that they neither say nor hear anything of this sort.

If, however, anyone is found saying or doing something forbidden, and is a free man who is not yet old enough to have been given a seat at the communal messes, he should be punished with loss of honors or with blows, while, if he is older than this, he should be punished with those dishonors usually reserved for the unfree, because he has acted in a manner characteristic of slaves.

Since we are banishing speech about anything of this sort, it is evident that we should also banish looking at pictures or stories that are unseemly. The officials must take care, then, that no statue or picture be an imitation of such actions, except in the precincts of certain gods at whose festivals custom permits even licentious raillery to occur.[331]

In addition to these, the law allows those of a suitable age to pay this sort of honor to the gods on behalf of themselves, their children, and their wives. But there must be legislation[332] that younger people not be spectators either of iambus[333] or of comedy until they have reached the age when it is appropriate for them to recline at the communal table and drink wine, at which time their education will make them entirely unaffected by the harm resulting from such things.

330. 791d–792e.

331. Ritualized obscenity and scurrilous mockery played a role in certain religious festivals honoring Dionysus, Demeter, and other gods.

332. Reading θεατὰς νομοθετητέον.

333. A figure named "Iambe" is mentioned in the *Homeric Hymn to Demeter*, who uses language so abusive that the goddess is overcome by laughter and forgets her sorrows. Iambus is associated especially with scurrilous personal humor of the sort exemplified by the work of Archilochus.

To be sure, our present discussion of this issue has been cursory. Later on we must stop and determine it at greater length,[334] first going through the puzzle of whether [prohibiting the attendance of the young at such performances] should be done or not, and if so how it should be done. But the present was the appropriate time, however, to have made mention of it to the extent necessary. For perhaps the remark of Theodorus, the tragic actor, was not a bad one; for he said that he never allowed anyone else, not even an incompetent actor, to enter a scene before him, because audiences become accustomed to the voice they hear first. The same is true of our relationships with people and things: all we encounter first we like better. That is why everything base must be made alien to the young, especially if it involves depravity or ill will.

When the first five years have passed, children should spend the two years till they are seven observing the lessons they themselves will need to learn. There are then two stages in their education that must be distinguished, from seven years to puberty and from puberty to twenty-one years. For those who divide the stages of life into seven-year periods are not for the most part incorrect. And one should follow the natural division; for every craft and every sort of education wishes to fill in what nature leaves out. **1337ª1**

First, then, it must be investigated whether some order must be produced that is concerned with the children; next, whether it is advantageous for the supervision of them to be made a communal matter or done in some private way (as is also the case in most cities now); and third, what sort of supervision it should be.

BOOK 8

8.1
Education Should Be Communal

No one would dispute that the legislator must be especially concerned with the education of the young; for in fact in cities where this does not occur, its absence is harmful to the constitutions; for education should in fact have a view to each particular constitution; for the character that properly belongs to each constitution usually both safeguards it and puts the constitution in place from the start (for example, the democratic character does so for a democracy, and the oligarchic one for an oligarchy), and a better character is a cause of a better constitution in all cases. Further, in the case of every capacity and craft there are things one must have prior education and prior habituation in, with a view to the sorts of work that each must do. So it is clear that this also holds with a view to the actions of virtue.

334. Not in the extant *Politics*.

But since the end for the whole city is a single end, it is evident that education too must be one and the same for all, and that its supervision must be communal, not private as it is at present, where each individual supervises his own children privately, teaching them whatever private instruction he believes [to be best]. But for communal matters, the training too should be communal.

At the same time, one should in no way think that any citizen belongs to himself alone, but that all of them belong to the city, each being a part of the city. And it is natural for the supervision of each part to look to the supervision of the whole. One might praise the Spartans on account of this; for in fact they pay the most serious attention to their children, and do so communally.

8.2
The Aims of Education

It is evident, then, that there must be legislation concerning education, and that this must be made communal. But what the education is to be and how someone must be educated should not be neglected. For as things stand there is dispute about its works. For not everyone supposes that the young should learn the same things, whether with a view to virtue or with a view to the best life, nor is it evident whether it is more appropriate that it be more with a view to thought or with a view to the character of the soul.

Investigation on the basis of current education results in confusion, since it is not at all clear whether people should be trained in what is useful for life, in what conduces to virtue, or in something out of the ordinary (for all these proposals have acquired some advocates). Also, nothing is agreed about what furthers virtue (for in fact people do not all esteem the same virtue to begin with, so that it is reasonable to expect them also to diverge about the training needed for it).

1337b1

That children should be taught those useful things that are necessary, however, is not at all unclear. But it is evident that they should not be taught all of them, there being a difference between the works of the free and those of the unfree, and that they should share only in such things as do not make those who share in them unrefined. (Any work should be considered unrefined, and so too any craft or branch of learning, if it renders the body, the soul, or the thought of free people useless for the uses and actions of virtue. That is why we call "unrefined" both the sorts of crafts that put the body into worse condition and the sorts of work that are done for wages. For they make thought unleisured and low.)

Even in the case of some of the free sciences, while it is not unfree to share in them up to a point, to overly apply oneself to them with a view to exactness is liable to result in the harms just mentioned. But what one does an action for the sake of, or learns for the sake of, also makes a big difference; for what one does for one's own sake, for the sake of friends, or because of virtue is not unfree, but someone who does

the same thing because of others would in many cases seem to be acting like a hired laborer or a slave.

8.3
Education and Leisure; Music (1)

The sorts of learning that are now laid down as a foundation, as was said previously,[335] tend in two directions. And there are pretty much four that are customarily taught: reading and writing, athletics, music, and fourth, in some cases, drawing. Reading and writing, as well as drawing, are taught because they are useful for life and have many uses, while athletics is taught because it contributes to courage. In the case of music there is immediately a puzzle to go through. For nowadays most people share in it for the sake of pleasure. But those who at the start assigned it a place in education, did so, precisely as has often been said,[336] because nature itself seeks not only the correct use of unleisure but also the capacity to be at leisure in a noble way. For this is the one starting-point of everything else, and so we should speak about it again.[337]

If both are needed, but being at leisure is more choiceworthy than unleisure and is its end, one must inquire about what it is people should spend their leisure doing. For surely they should not spend it in amusing themselves; for then it would be necessary for amusement to be the end of life for us. But if that is impossible, and if amusements are more to be used in periods of unleisure (for someone who exerts himself needs relaxation, and amusement is for the sake of relaxation, while unleisure is accompanied by toil and strain), because of this, those introducing amusement should watch for the opportune time to use it, as if dispensing it as a medicine. For this sort of movement of the soul is a loosening and, because of the pleasure it involves, a relaxation.

Being at leisure itself seems to involve pleasure, happiness, and living blessedly. **1338ᵃ1**
This, though, does not belong to those who are unleisured, but only to those who are at leisure; for the person who is being unleisured is being so for the sake of some end, because he does not possess it, while happiness is an end, and everyone thinks that it is accompanied not by pain but by pleasure. This pleasure is not taken to be the same by everyone, however, but each takes it to be what is in accord with himself and his state [of character], and the best person takes it to be the best pleasure, the one that comes from the noblest things. So it is evident both that certain things should be learned and taught with a view to the leisure spent in passing the time, and that these teachings and these sorts of learning are for their own sake, while those that are with a view to unleisure are necessary and for the sake of things other than themselves.

335. 1337ᵃ39–42.
336. 1271ᵃ41–ᵇ10, 1333ᵃ30–ᵇ5, 1334ᵃ2–ᵇ28.
337. A reference back to 7.13–15.

That is why our predecessors assigned music too a place in education, not on the supposition that it is necessary (for it is nothing of the sort); nor on the supposition that, like reading and writing, it is useful for making money, managing a household, acquiring learning, and for many political actions, or, as drawing seems to be, useful for judging the works of craftsmen more correctly; nor, again, on the supposition that, like athletics, it furthers health and vigor (for we see that neither of these results from music). What remains, then, is that music is for passing the time in leisure—which is manifestly precisely why people introduce it. For they assign it a place in what they think to be a pastime characteristic of free people. That is why Homer puts it this way: "Call the bard alone to the rich banquet," and then he goes on to mention certain others "who call the bard," he says, "that he may bring delight to all."[338] Elsewhere, Odysseus says that the best pastime is when men are enjoying good cheer and "the banqueters seated in due order throughout the hall, give ear to the bard."[339]

It is evident, therefore, that there is a certain sort of education that sons must be given not as something useful or necessary but as something noble and free. But as to whether it is of one sort or several, which these are, and how they should be taught—these are things that must be spoken about later on.[340] But as things stand, we have come this far along the route, that from the ancients we have some testimony based on the educational subjects they laid down as a foundation; for music makes this clear.

Further, it is also clear that children should be taught some of the useful things (such as reading and writing) not only because of their usefulness but also because many other sorts of learning become possible through them. Similarly, they should be taught drawing not in order not to make errors in their private purchases and avoid being cheated when buying or selling products, but rather because it makes them good at contemplating the beauty of bodies. To be inquiring everywhere about usefulness is least of all fitting for those who are great-souled and free.[341]

Since it is evident that education by means of habits must come before education by means of reason, and that education of the body must come before education of thought, it is clear from these that children must be given over to athletic training and coaching; for the first of these produces a certain quality in the state of their bodies and the other in its works.

8.4
Athletic Training

Some of the cities that nowadays seem to most supervise children produce in them a state appropriate for an athlete, damaging the form and the growth of their bodies,

338. *Odyssey* 18.382–385. The first line is not in the poem as we have it.
339. *Odyssey* 9.7–8.
340. Not in the extant *Politics*.
341. Reading ἐλευθέροις.

while the Spartans, though they did not make this error, nonetheless make them beast-like by the physical exertions they impose, on the supposition that this is the most advantageous thing with a view to courage. And yet, as has been said many times,[342] the supervision of children must neither look to just one [virtue] nor to this one above all. But even if this were the one, the Spartans have not succeeded in procuring it either. For neither in other animals nor in [barbarian] nations do we see courage following along with the greatest savagery, but with a tamer, lion-like character.[343] Many of these nations easily stomach killing and cannibalizing people—for example, of those that live around the Black Sea,[344] there are the Achaeans and Heniochi, and there are other nations on the mainland, some similar to those, others worse, that are skilled in raiding, but in courage they have no share.

Further, we know that the Spartans themselves, as long as they persisted in their love of physical exertions, were superior to others, while now in both athletic and military contests they are left behind by others; for they were superior to others not because they gave athletic training to their young people in that way, but because they alone were trained people competing against untrained ones.

So what is noble, not what is beast-like, should play the leading role here; for it is not the wolf or any other wild beast that would compete against noble danger, but rather a good man. And those who throw the young too much into these [physical exertions], and leave them without direction in the necessary things, produce people who are, at any rate, in truth unrefined, since they have made them useful for one political work only, and one at which they are worse, as our argument states, than other people. One should judge the Spartans not on the basis of their earlier works, but of their present ones, for now they have people who compete with them in education, while earlier they had not.

It is agreed, then, that one must make use of athletic training, and how one must make use of it. For until they reach puberty lighter athletic exercises should be given, but a strict diet and physical exertions should be forbidden, in order that nothing impede their growth; for it is no small sign that this can have such an effect that in the Olympic Games one can find only two or three cases in which the same people were victorious both as men and boys, because, when the young are trained, the necessary athletic exercises take away their strength, but when they have spent the three years after puberty on the other sorts of learning, it is fitting for the next period of their lives to be preoccupied both with physical exertions and strict dieting; for one should not exert thought and body at the same time, for each of these sorts of exertion naturally produces a contrary effect: exerting the body impedes thought; exerting thought impedes the body.

342. $1271^{a}41$–$^{b}10$, $1333^{b}5$–10, $1334^{a}2$–$^{b}28$.
343. *HA* $488^{b}16$–17, $628^{b}8$–9.
344. *NE* $1148^{b}21$–24.

8.5
Music (2)

As regards music, although we have also gone through some of the puzzles in our previous account, it will be well to take these up again now and develop them, in order to provide a sort of keynote for the arguments one might state in an exposition of the subject. For it is not easy to determine what the capacity of music is, or what one should share in it for the sake of. Is it for the sake of amusement and relaxation, like sleep and drink? (For these are not intrinsically excellent things, but pleasant ones, and, at the same time, they "put an end to care," as Euripides says.[345] That is also why people class music together with these things and make similar use of all of them, sleep, drink, and music—and also include dancing among these.) Or perhaps one must think instead that music contributes something to virtue, on the supposition that, just as athletic training establishes a certain quality in the body, so music has the capacity to produce a character of a certain quality, by habituating us to be capable of enjoying ourselves correctly? Or does music contribute something to passing the time and to practical wisdom? For in fact this is to be counted as third of the things mentioned.[346]

It is not unclear that the young should not be educated for the sake of amusement (for while they are learning they are not amusing themselves; for learning involves pain). But neither is it fitting to give a pastime to children of that age, at any rate (for the end [as something complete] is not appropriate for anyone who is incomplete).

But perhaps it might seem that what is a serious matter for children is for the sake of the amusement they will have when they have become men and complete. If that were so, however, what must they learn music themselves for the sake of? Why should they not, like the kings of the Persians and the Medes, take part in musical learning and its pleasure through [the performances of] other people? For those who have made this very thing their work and craft will necessarily produce something better than those who devote only as much time to it as is needed for learning. On the other hand, if they have to exert themselves in such things, they would also have to prepare themselves for the business of gourmet cooking. But that is absurd.

There is the same puzzle, however, even if music is capable of making people's characters better; for why must they learn it themselves, rather than, when listening **1339b1** to others, enjoy it in the correct way and be able to judge [its qualities], like the Spartans? For they do not learn it themselves, but are still able, so they say, to judge which melodies are good and which not good.

The same argument also applies if music is to be used with a view to well-being and a free passing of the time: why must they learn it themselves rather than have the

345. *Bacchae* 381 (paraphrased).

346. Amusement is mentioned at 1337b36–1338a1; passing the time at 1334a11–b5; practical wisdom, which involves virtue of character (*NE* 1144b30–32), at 1333a16–30, 1337b22–33.

enjoyment of other people's use of it? For one might investigate the supposition we have about the gods; for Zeus himself does not sing or play the lyre to accompany the poets. On the contrary, we even say that people of this sort are unrefined, and that doing the actions is not for a [true] man, unless he is drunk or amusing himself.

But perhaps these matters must be investigated later on.[347] The first inquiry is whether music is not to be counted as included in education or is to be counted, and in which of the three things puzzled about previously its capacity lies, amusement, education, or passing the time. And it seems reasonable to assign it a place—and it appears to have a share—in all of them. For amusement is for the sake of relaxation, and relaxation is necessarily pleasant (for it is a sort of cure for the pain caused by one's exertions).

Also, it is generally agreed that one's pastime should not only involve what is noble but also what is pleasant (for being happy is composed of both of these). And everyone says that music is among the most pleasant things, both when it is unaccompanied and when it involves singing. At any rate, Musaeus says that "singing is the most pleasant thing for mortals." That is why, indeed, it is reasonably included in social gatherings and pastimes, as having the capacity to delight. And so one might suppose from that too that young people should be educated in music. For those pleasures that are harmless are fitting not only with a view to the end, but also with a view to relaxation. But since it rarely happens that human beings attain the end, while they do frequently relax and make use of amusements (not only because relaxation and amusements lead to other things, but also because of pleasure), it would be useful to allow the young to find rest from time to time in the pleasures coming from music.

What has happened, however, is that human beings make amusements their end; for presumably the end involves a certain pleasure too, although not just a random one, and in their search for it they take amusement to be it, because pleasure has a certain similarity to the end of actions. For the end is not choiceworthy for the sake of anything that will be, and these sorts of pleasures are not choiceworthy for what will be, but because of things that have happened—for example, physical exertions and pains. One might reasonably suppose, then, that it is due to this cause that they seek to achieve happiness by means of these pleasures. But as regards their taking part in music, it is not because of this alone, it seems, but also because it is useful with a view to relaxation.

Yet one must surely investigate whether this effect is not coincidental and music's nature more estimable than one that is in accord with the use just mentioned, and **1340ᵃ1** whether one should not merely share in the common pleasure that comes from music, of which everyone has a perception (for music has a natural pleasure, which is why the use of it is agreeable to people of all ages and characters), but see whether it contributes in some way to character and soul. This would be clear, if we come to be of a certain quality in our characters through music. But that we do come to

347. 8.6.

be of a certain quality is surely evident because of many different things, not least, indeed, because of the melodies of Olympus; for it is generally agreed that they make souls become ecstatic, and ecstasy is a feeling connected to the character of the soul. Further, everyone who listens to imitations comes to have the corresponding feelings, even in separation from the rhythms and melodies of these imitations.

But since music happens to be one of the pleasures, and virtue is concerned with enjoying, loving, and hating in the correct way, it is clear that one should learn and become habituated to nothing so much as correctly judging and enjoying decent characters and noble actions. And in rhythms and melodies there are the greatest likenesses to the true natures of anger and gentleness, and of courage and temperance besides, and of all the contraries of these, and of the other [components of] characters (this is clear from the facts; for we are altered in our souls when we listen to such things). But someone who is habituated to being pained or being pleased in the case of likenesses is close to being the same way in relation to the true things. For example, if someone enjoys contemplating an image of something due to no other cause than its shape, he will himself necessarily enjoy contemplating the very thing whose image he is contemplating.

It happens, however, that in other perceptible objects—for example, in those of touch and taste—no likenesses of [the components of] characters are present, although the objects of sight contain faint ones. For there are a few shapes that do contain such likenesses, and everyone[348] shares in this sort of perception; besides these are not likenesses of [the components of] characters, but rather the shapes and colors that are produced are signs of the components of characters, and these signs refer to the body[349] that is in the grip of the feelings. Nonetheless, insofar as there is a difference also in the contemplation of these, the young should not look at the works of Pauson, but rather those of Polygnotus or any other painter or sculptor able to represent character.

In melodies themselves there are imitations of the [components of] characters. And this is evident; for, to begin with, the nature of the harmonies is divided, so that listeners are put into distinct states and do not have the same way of responding to each of them. Instead, they respond to some—for example, the so-called Mixolydian—in a more mournful and anxious way; to others—for example, the more relaxed ones—they respond with softer thought; they are in a mean and settled state most of all in response to a distinct one, the Dorian (which seems to be the only one of the harmonies that produces this effect); and the Phrygian makes them ecstatic. For these points have been well discussed by those who have philosophized about this sort of education; for the evidence for their accounts comes from the facts themselves. It is the same way too with the rhythms (for some have a character that is

348. Rejecting the addition of οὐ.
349. Reading ἐπὶ τοῦ σώματος.

productive of stability, others one that is productive of movement, and of these some involve movements that are more unrefined, while others involve more free ones).

It is evident from all these considerations, then, that music has the capacity to make the character of our soul be of a certain quality. And if it has the capacity to produce this, it is clear that young people must be introduced to it and educated in it. And instruction in music is fitting to the nature of those at that stage of life; for the young, because of their age, do not voluntarily put up with anything that is unsweetened with pleasure, and music is something naturally sweet. Also there seems to be a certain natural affinity to harmonies and rhythms, which is why many of the wise say that the soul is a harmony,[350] others that it has a harmony.[351]

8.6
Music (3)

The question of whether they themselves should learn to sing and play an instrument or not—which is just the puzzle raised previously[352]—must now be spoken about. It is not unclear, then, that it makes a great difference to the development of certain qualities if someone shares in the works himself; for if people do not share in the works, it is impossible or difficult for them to become excellent judges of their quality. At the same time, children should have something to occupy them, and the rattle of Archytas, which they give to children to keep them from breaking things in the house, should be considered a good invention; for what is young cannot keep still. This, then, is fitting for children in their infancy, and education is a rattle for older children.

It is evident from these considerations that children must be educated in music in such a way that they are capable of sharing in the works. And it is not difficult to determine what is suitable or unsuitable for the different ages, or to solve the puzzle raised by those who say that the pursuit is unrefined. For, first, since it is for the sake of judging that one should participate in the works, because of this they must make use of the works while they are young, while when they are older they must give them up, but be able to judge which melodies are noble and enjoy them in the correct way, due to what they learned while they were young.

As for the criticism raised by some people, that music makes people unrefined, it is not difficult to resolve by investigating the extent to which those being educated in political virtue must participate in [musical] works, and what sorts of melodies and rhythms they must participate in, and further, on which sorts of instruments they must do their learning, for this too is likely to make a difference. For the resolution of the criticism depends on these considerations; for nothing prevents certain modes **1341ᵃ1**

350. Including Pythagoras of Samos (*DA* 407ᵇ30–408ᵃ28).
351. Including Plato, *Phaedo* 93c–94b.
352. 1339ᵃ33–ᵇ11.

of music from producing the effect mentioned.[353] It is evident, then, that learning music must neither impede later actions nor make the body unrefined and useless for military and political training—for current uses, on the one hand, and for later sorts of learning, on the other.[354]

This could be brought about in the case of learning if they did not exert themselves either with a view to competitions requiring craft-like expertise and exertion or with works that excite wonder or are extraordinary (which have now made their way into competitions and from there into education), but learned such things[355] too up to the point at which they are able to enjoy noble melodies and rhythms, and not only the common element in music, as even some of the other animals do, and the majority of slaves and children besides.

It is also evident from these considerations what sorts of instruments must be used. Pipes must not be introduced into their education, or any other instrument requiring craft-like expertise, such as the cithara or any other that may be of this sort, but rather those instruments that will make them good listeners either in their musical education or in any other sort. Further, the pipe has to do not with character, but rather with frenzy, and so the correct occasions for its use are those where contemplation has the capacity to effect a purgation rather than learning. And let us further add that a contrary factor with a view to its use in education is that playing the pipe prevents speech.

That is why our predecessors correctly rejected its use by the young and by free people, even though they had used it at first. For when they came to be more at leisure because of their greater prosperity, and greater-souled as regards virtue, and further, when on the basis of their works both before and after the Persian Wars they became presumptuous, they latched onto every sort of learning, making no distinction but pursuing them all. That is why they also included pipe playing among the things they learned. For even in Sparta a certain patron played the pipe himself to accompany his own chorus. And in Athens pipe playing became such a local custom that most free men pretty much participated in it, as is clear from the tablet that Thrasippus set up when he had been patron for Ecphantides.

Later, when they were better able to judge what does contribute to virtue and what does not, pipe playing was rejected, because of their experience with it. And the same thing happened to many other ancient instruments, such as the pectis, the barbitos, and those that contribute to the pleasure of people who listen for expressive effects,[356] the heptagon, the trigona, the sambukai,[357] and all those requiring a scientific virtuosity.

1341b1

353. I.e., that of making those who play them unrefined.
354. Reading χρήσεις . . . μαθήσεις.
355. Rejecting the addition of μὴ.
356. Reading χρωμάτων.
357. Stringed instruments of various sorts, akin to the harp.

The story told by the ancients about pipes is also reasonable. For they, as you know, say that Athena invented pipes but threw them away. There is nothing wrong with saying that the goddess did this out of annoyance at how pipe playing distorted her face, but the more likely explanation is that education in pipe playing does nothing for thought, and it is to Athena that we attribute scientific knowledge and craft knowledge.

We reject craft-like education, then, both in instruments and in the execution, and by "craft-like" I mean with a view to competitions; for the practitioner pursues this sort of education not for the sake of his own virtue, but for the sake of the pleasure of listeners, and an unrefined pleasure at that. That is why we judge its execution to belong not to free men but more to hired laborers, and they do indeed become unrefined as a result; for the target they set up as their end is a base one; for the contemplator of it, because he is unrefined, usually alters the music, so that he produces certain qualities in the craftsmen who perform for him, and in their bodies, because of the movements.

8.7
Music (4)

But further investigation must be made of harmonies and rhythms with a view to education, as to whether all the harmonies and all the rhythms must be used, or whether they must be divided, and next whether we should set up the same division for those who are exerting themselves with a view to education, or, third,[358] some distinct one. Since we see that music consists of melody-making and rhythms, what capacity each of these has as regards education should not be overlooked, and whether one must deliberately choose music that has a good melody or rather music that has a good rhythm.

Considering as correct, then, much that has been said about these things by some current experts on music as well as by those from philosophy who happen to be experienced in issues pertaining to musical education, we will deliver over to them those who wish to seek an exact accounting of each particular one. At the moment, however, we will draw distinctions in the way laws do, and speak about these things only in outline.

We accept the division made by some of those in philosophy who divide melodies into those relating to character, those relating to action, and those relating to ecstasy, claiming that the harmonies are by nature akin to these particular melodies, one being related to one melody, and another to another.

We say, though, that music should not be used for the sake of one benefit but several; for it is for the sake of both education and purgation (as to what we mean by

358. Retaining τρίτον.

purgation, we will speak of it in simple terms now, but again and more perspicuously
40 in our discussions concerning poetics[359]), and third, for passing the time, for rest, and for the relaxation of one's tensions.

1342a1 Hence it is evident that all the harmonies are to be used, but that they are not all to be used in the same way. Instead, with a view to education one must use those that most have to do with character, but for listening to while others perform them, both those that relate to action and those that relate to ecstasy. For the feeling that
5 strongly affects some people's souls is present in everyone, although to a different degree, either greater or lesser—for example, pity and fear, and ecstasy besides; for in fact there are certain people who are prone to being possessed as a result of this movement.[360] But under the influence of sacred melodies (when they make use of the ones that induce a frenzy in their souls), we see that they calm down, as if they had
10 received medical treatment and a purgation. The same thing, then, must be undergone by those who are prone to pity or fear or to feelings generally, and by others to the extent that each of these things falls to them, and they all get, together with pleasure, a certain purgation and feel their burdens lightened.[361] In a similar way, the
15 purging[362] melodies provide harmless enjoyment to human beings.

That is why the use of these sorts of harmonies and these sorts of melodies must be permitted to competitors who perform music for the theater. But since the theater audience is twofold, one free and well educated, the other unrefined, composed of
20 unrefined people, hired laborers, and other people of that sort, the latter too must be provided with competitions and spectacles with a view to relaxation. And just as their souls are distorted from the state that is in accord with nature, so too there are harmonies that are deviations and melodies that are strained and involve excessive expressive effects, and what produces pleasure for each person is what is akin to his
25 nature. That is why authorization to use a certain sort of music of this kind should be given to those who compete before a theater audience of this sort.

But, as has been said,[363] with a view to education the melodies that have to do with character must be used as well as harmonies of this sort. And the Dorian is of this
30 sort, as we said previously,[364] but one should accept any other that passes the examination carried out for us by those who share in the pursuit of philosophy and musical education. The Socrates of the *Republic* was not correct, however, to retain only the Phrygian along with the Dorian,[365] especially since he includes the pipe among the
1342b1 instruments he rejects. For the Phrygian has the same capacity among harmonies as

359. Not in the extant *Poetics*.
360. Either the movement that constitutes the melody or the movement in the soul that constitutes the feeling produced by it.
361. *Po.* 1449b24–28.
362. Reading καθαρτικὰ.
363. 1342a2–3.
364. 1340b3–4.
365. 399a–e.

the pipe has among instruments; for both are productive of frenzy and expressive of feeling. For all Bacchic frenzy and all movements of that sort are, among instruments, most characteristic of the pipe, while among the harmonies, the Phrygian melodies are the ones that are suited to these.

Composition makes this clear. For example, the dithyramb seems by general agreement to be Phrygian. And those who comprehend this matter mention many examples of this, notably the fact that when Philoxenus tried to compose a dithyramb—*The Mysians*—in Dorian, he could not do it, but as a result of the dithyramb's very nature fell back into Phrygian again, which is the harmony naturally appropriate to it.

As for the Dorian, everyone agrees that it is the most steady and has most of all a courageous character. Further, since we praise the mean between extremes, and say that it is what we must pursue, and the Dorian has this nature in relation to the other harmonies, it is evident that being educated in the Dorian melodies is more appropriate for younger people.

There are two targets: the possible and the appropriate. And in fact each individual should more undertake things that are possible and appropriate. But these things are determined by one's stage of life. For example, it is not easy for people exhausted by age to sing harmonies that are strained; rather, nature suggests the relaxed harmonies for their stage of life. That is why some of those concerned with music rightly criticize Socrates for this as well, that he rejected the relaxed harmonies for the purposes of education not because they have the capacity that drink has, on the supposition that they conduce to drunkenness (for drink instead produces Bacchic frenzy) but because they make us weak.[366] So, with a view also to that future stage of life, old age, one should avail oneself of harmonies of this sort and melodies of this sort.

Further, if there is a certain sort of harmony that is appropriate for the age of children, because it has the capacity to provide both order and education at the same time, as appears to be particularly the case with the Lydian harmony, then it is evident that these three things must be made the defining marks in education: the mean, the possible, and the appropriate.

366. *Republic* 398e.

RHETORIC*

BOOK 1

1.1
What Rhetoric Is

Rhetoric is the counterpart of dialectic; for both are concerned with such common things as are, in a way, known to all and belong to no definite science. That is why all, in a way, share in both; for to a certain extent all try both to examine and to uphold an argument, as well as to defend themselves and accuse someone. Among ordinary people, some do these things extemporaneously, others due to a state acquired by habit. But since both ways are possible, it is clear that the same things could be done in a methodical way; for it is possible to get a theoretical grasp on the cause due to which some succeed because of habit and others because of chance; and getting such a grasp, all would immediately agree, is the work of a craft. **1354ª1**

As things stand, those who have put together studies on the craft of speeches have provided (one might almost say) no part of it;[1] for only the means of persuasion are within the province of craft; the other things are appendages. But these writers say nothing about enthymemes, which are precisely the body of the means of persuasion, but mostly busy themselves with matters that are outside the thing at issue; for accusation, pity, anger, and such feelings of the soul do not have to do with the thing at issue, but are related to the judge. So if all trials were conducted as they now are, at any rate, in some cities, especially those that are in good legislative order, these writers would have nothing to say; for everyone thinks that the laws should proclaim this way of doing things, and some even make use of them and prohibit speaking of matters outside the thing at issue, as they do in the court of the Areopagus, which correctly legislates against this; for one should not distort [the judgment of] the judge by arousing anger, fear, or pity in him; for this would be as if someone who is going to use a standard [first] made it crooked. Further, it is evident that the task of the opponent is nothing at all outside of proving that [the thing at issue] is or is not the case, or did or did not occur. As to whether it is a large thing or a small one, however, or a just or an unjust one, whatever the legislator has not defined, the judge should doubtless recognize for himself and not learn from the disputing parties.

* Translated by C. D. C. Reeve. Text R. Kassel, *Aristotelis Ars Rhetorica* (Berlin, 1976).

1. Reading οὐδὲν ὡς εἰπεῖν.

Above all, it is fitting for laws that are correctly laid down to define everything themselves, wherever possible, and leave the fewest things up to the judges: first, because it is easier to find one or a few than to find many who are practically
1354ᵇ1 wise and capable of legislating and judging; next, legislation comes about on the basis of long-term investigations, while judgments are made on the spur of the moment, so it is difficult for the judges to give justice and advantage their due.
5 The most important factor of all, however, is that the judgment of a legislator is not a particular one, but is rather about future things and indeed about what is universal, while the assemblyman and the judge are already judging about present and definite issues, in relation to which they already feel both love and hatred, and with which their own private advantage is already knitted together, so that they
10 are no longer capable of adequately seeing the truth, but instead their own private pleasure or pain overshadows their judgment. As regards other matters, then, as we say, the judge should be put in control of the fewest things, but where what has happened or has not happened, will be or will not be, or is or is not are concerned,
15 it is necessary to leave them up to judges; for it is not possible for the legislator to foresee them.

If this is so, however, it is evident that those who define the other things are attempting to treat matters outside the thing at issue as being within the province of craft—for example, what the introduction or the narration should contain, as well as each of the other parts (for they busy themselves with nothing else except how to
20 produce a certain quality in the judge), while about the means of persuasion that are within the province of craft they prove nothing, but it is on the basis of these that one would become enthymematically competent.

This is why indeed, although the same methodical inquiry is concerned with public and judicial oratory, and although public oratory is a nobler study and more suited to a citizen than the one concerned with transactions, these writers say nothing about
25 the former, but all try to treat speaking in court as within the province of craft. This is because, in cases of public oratory, it furthers the work less to speak of matters outside the thing at issue and because public oratory is less malicious than judicial oratory, because more common in its scope.[2] For there the person making a judgment is judging about his own affairs, so that no other thing is needed except to demonstrate
30 that things are as the advisor says they are. In judicial cases, by contrast, this is not enough, but rather it furthers the work to win over the listener; for the judgment is about other people's affairs, so that the judges, looking to their own affairs, and listening with a view to gratification, surrender themselves to the opponents, and do not
1355ª1 judge. That is why, as we said previously,[3] in many places the law prohibits speaking outside the thing at issue [in court], while in deliberative contexts the people making the judgment adequately keep a watch over this.

2. Reading καὶ ἧττον ἐστι . . . κοινότερον.
3. 1354ª22–23.

Since it is evident that the methodical inquiry that is within the province of craft is concerned with the means of persuasion and a means of persuasion is a sort of demonstration (for we are most persuaded when we take something to have been demonstrated), and a rhetorical demonstration is an enthymeme (and this is, one might almost say, unconditionally the most controlling means of persuasion),[4] and an enthymeme is a sort of deduction (and it belongs to dialectic, either as a whole or to one of its parts, to see about every sort of deduction), since all that is so, it is clear that the person who is best able to get a theoretical grasp on the materials on the basis of which, and the manner in which, a deduction comes about is also the one who is most competent in the use of enthymemes, when he also grasps what sorts of things an enthymeme is concerned with and what sorts of differences there are between it and logico-linguistic deductions; for it belongs to the same capacity to see the truth and what is like the truth, and at the same time human beings are naturally adequate as regards the truth and in most cases hit upon it. That is why the capacity to aim at and hit upon the acceptable beliefs belongs to the person who has a similar capacity with regard to the truth.

It is evident, then, that the other writers treat matters outside the thing at issue as within the province of craft, and also evident why they lean more toward judicial oratory.

Rhetoric is useful because true things and just things are by nature stronger than their contraries, so that if judgments are not in accord with what is fitting, it must be because of these[5] that they are defeated, and this merits criticism.

Further, not even the possession of the most exact scientific knowledge would make it easy for us in speaking to persuade some listeners on the basis of it; for argument in accord with scientific knowledge is teaching, but teaching is impossible [in their case]. Instead, it is necessary to produce our means of persuasion and arguments out of common things, as we said in the *Topics* about encounters with ordinary people.[6]

Further, one should be capable of persuading people of contraries, just as in the case of [dialectical] deductions, not so as to do both in action (for one should not persuade people of base things), but in order that it not escape our notice how things stand, and, if someone else uses arguments in an unjust way, so as to be able to refute them for ourselves. None of the other crafts deduces contraries; dialectic and rhetoric alone do this; for both are alike concerned with contraries. To be sure the underlying things at issue are not alike. On the contrary, true and better ones are always by nature more easily deduced and unconditionally more persuasive.

In addition, it would be absurd if not being capable of defending oneself with one's body is shameful, while not being capable of doing so with speech were not

4. Reading καὶ ἔστι . . . πίστεων.
5. Reading δι' αὐτῶν instead of δι'αὐτὸν.
6. 101[a]26–36.

1355b1 shameful; for the latter is more special to a human being than the use of the body. [If it is objected] that the one who unjustly uses such a capacity for [making] speeches might do great harms, that objection applies to all good things except virtue, and especially to the most useful ones, such as strength, health, wealth, and generalship; for by using these justly someone can confer the greatest benefits, and by using them unjustly, the greatest harms.

It is evident, then, that rhetoric does not deal with a definite kind, but is like dialectic, and that it is useful, and that its work is not to persuade but to see the persuasive factors belonging in each case, just as in all the other crafts; for it is not the work of medicine to produce health either, but rather to promote health as far as possible; for even to those who are incapable of partaking in health it is nonetheless possible to give good treatment. In addition, it is evident that it is a work of the same craft to see what is persuasive and what is apparently persuasive, just as in the case of dialectic it is to see the deduction and the apparent deduction; for sophistic is what it is in virtue not of its capacity but of the deliberate choice. Here, in the case of rhetoric, however, one person is an orator in virtue of his scientific knowledge, another in virtue of his deliberate choice, while there, in dialectic, a sophist is so called in virtue of his deliberate choice, and a dialectician is so called not in virtue of his deliberate choice, but in virtue of the capacity he has.

Let us now try to discuss the methodical inquiry itself, and the manner in which and the materials on the basis of which we will be capable of achieving the goals we set down. Let us, then, as it were, make a fresh start, and, having defined again what rhetoric is, state the rest.

1.2
Means of Persuasion; Likelihoods, Signs, and Proofs; Common and Special Topics

Let rhetoric, then, be a capacity to get a theoretical grasp on what is possibly persuasive in each case. For this is not the work of any other craft whatever; for each of the others is capable of teaching and persuading about its own subject matter—for example, medicine about healthy and unhealthy things, geometry about the coincidental affections of magnitudes, and arithmetic about numbers, and likewise the rest of the crafts and sciences. But rhetoric seems to be able to get a theoretical grasp on what is persuasive on (one might almost say) any given subject matter. That is why we say that, as craft-like, it is not concerned with a special, definite kind.

Among the means of persuasion, some are outside the province of craft, while others are within the province of craft. By "outside the province of craft" I mean those that are not provided by ourselves [as orators] but are there at the start—for example, witnesses, results of torture, contracts, and the like. And by "within the

province of craft" I mean those capable of being furnished by the methodical inquiry and ourselves. So one must use the former and find the latter.

Among the means of persuasion that proceed through speech, there are three **1356^{a}1** forms; for some depend on the character of the speaker, some on disposing the listener in some way, and some on the argument itself, due to its proving or appearing to prove something.

Persuasion is through character whenever the speech is stated so that it makes 5 the speaker worthy of trust; for we trust decent people more, and more readily, on simply all subjects, and trust them entirely where there is no exactness but rather no belief either way. This should come about through the speech, however, not through prior belief that the speaker is of a certain quality. For it is not the case, as some claim, who treat the subject as within the province of craft, 10 that the decency of the speaker contributes nothing to persuasiveness; rather, character is pretty much (one might almost say) the most controlling factor in persuasion.

Persuasion is through the listeners whenever they are led by the speech to have a certain feeling; for we do not give the same judgments pained and pleased, or loving 15 and hating. It is with this, and only with this, we say, that those people busy themselves who now treat the subject as within the province of craft. The details about this will be made clear when we speak about feelings.[7]

Persuasion is through argument whenever we make clear the truth or the apparent truth on the basis of what is persuasive in each case.

Since, though, the means of persuasion are through these things, it is evident that 20 to get hold of them a person must be capable of deducing and of getting a theoretical grasp on character, on the virtues, and third on feelings—that is, on what each of them is and what sort of thing, and from what it arises and in what way. So it follows that rhetoric is a sort of offshoot of dialectic and of the study concerned with ethics, 25 which it is right to call "politics." That is why rhetoric cuts the same figure as politics, as do those who pretend to a knowledge of it—some through lack of educatedness, some through boastfulness, and some through other human causes. For it is a part 30 of dialectic, and similar to it, as we also said at the start;[8] for neither of them is the science of how things stand with some definite [kind], but rather both are capacities for providing arguments.

About their capacities themselves, then, and how they stand in relation to each other, pretty much enough has been said.

{In cases of persuasion that operate through proving or appearing to prove some- 35 thing, just as in dialectical ones there is induction, deduction, and apparent deduc- **1356^{b}1** tion, so it is like that here as well; for a paradigm is an induction, and an enthymeme a deduction, and an apparent enthymeme an apparent deduction. I call a rhetorical

7. 2.2–11.
8. 1354^{a}1.

deduction an "enthymeme," and a rhetorical induction a "paradigm."}[9] And everyone produces means of persuasion through proving something by means either of paradigms or of enthymemes, and of nothing beyond these. So if indeed it is, in general, necessary to prove anything whatever either by deduction or by induction (and this is clear to us from the *Analytics*[10]), it necessarily follows that enthymemes and paradigms are, respectively, the same as deductions and inductions.

The difference between a paradigm and an enthymeme is evident from the *Topics*[11] (for there deduction and induction were spoken about previously), that to prove on the basis of many similar cases that things are a certain way is an induction in dialectic and a paradigm in rhetoric, while to prove that if some things are so, something beyond them follows by their being so, whether universally or for the most part, is called in dialectic a "deduction" and in rhetoric an "enthymeme." And it is evident too that each form of rhetoric has [its] advantage; for what is said in the *Methodics* is so in these cases as well; for some speeches are paradigmatic, others enthymematic; and speakers are the same way, some are paradigmatic, others enthymematic. Arguments through paradigms are not less persuasive, but enthymematic ones are more applauded. The cause, and how each should be used, we will discuss later. Now, though, we will define these things themselves more clearly.

For since the persuasive is persuasive to someone (and is either immediately persuasive and convincing by itself or seems to be proved by such things), and since no craft investigates what is particular (for example, medicine does not investigate what is healthy for Socrates or Callias but for a person of such-and-such a sort or for persons of such-and-such a sort—for this is in the province of craft, while what is particular is unlimited and is not scientifically knowable), rhetoric does not get a theoretical grasp on a particular acceptable belief either (for example, one adopted by Socrates or Hippias) but on one adopted by people of such-and-such a sort, just as in the case of dialectic.

For even dialectic does not deduce from random things (for even to crazy people some things appear to be so) but from things [that appear to be so] to those in need of argument, as rhetoric does from things [that appear to be so] to those already **1357ᵃ1** accustomed to deliberate among themselves. But rhetoric's work is concerned with the sorts of things we deliberate about and have no crafts for, and in the presence of such listeners as are not capable of getting a comprehensive view of many things or of rational calculation from a distant [starting-point]. And we deliberate about things that appear to admit of alternative possibilities; for no one deliberates about things that they take to be incapable of being otherwise than they have been, will be, or are; for there is nothing more [to do about it].

9. Probably out of place.
10. *APr*. 2.23–24, *APo*. 71ᵃ1–11, 1.18.
11. 100ᵃ25–30, 105ᵃ10–12.

It is possible to deduce and draw conclusions either from previous deductions or from things that are not deduced, but which are in need of being deduced because they are not acceptable beliefs. The former, however, are of necessity not easy to follow due to their length (for the judge is assumed to be a simple person), while the latter are not persuasive because they are not drawn from things that are agreed nor from acceptable beliefs.

So it is necessary for both an enthymeme and a paradigm to be concerned with things that for the most part admit of being other than they are (a paradigm being an induction, an enthymeme being a deduction), and to be composed of few premises and fewer often than those that compose the primary deduction;[12] for if one of these is known, there is no need to state it; for the listener himself supplies it. For example, to show that Dorieus was the victor in a competition in which the prize was a crown, it is enough to say that he won a victory in the Olympic Games; there is no need to add that the prize in the Olympic Games is a crown; for everyone knows that.

Since few of the premises from which rhetorical deductions are composed are necessary (for most of the things that judgments and investigations are concerned with admit of being otherwise; for people deliberate about and investigate what they do in action, and things done in action are all of this kind and none—one might almost say—is necessary), and since things that happen for the most part and are possible must be deduced from other such things, and necessary ones from necessary ones (and this is also clear to us from the *Analytics*[13]), it is evident that while some of the premises on the basis of which enthymemes are stated will be necessary, the majority will hold for the most part. But enthymemes are based on likelihoods and signs, so that it is necessary that each of these be the same as the corresponding one of the former.

A likelihood is what comes about for the most part, not however simply so, as some people define it,[14] but rather when it concerns things that admit of being otherwise, standing in relation to what it is a likelihood in relation to as the universal stands to the particular.

Among signs, on the other hand, some are related as particular to universal, others as universal to particular. Among these, a necessary sign is a proof (*tekmêrion*), while that which is not necessary has no name indicating the difference. I call "necessary" those from which a deduction comes about. That is why indeed such a sign is a proof; for when people think that it is not possible to refute what has been stated, they think they are putting forward a proof, on the supposition that the matter has been proved and come to an end; for *tekmar* and *peras* are the same in the ancient tongue.[15]

An example of signs related as particular to universal is if someone were to say that, since Socrates is wise and just, it is a sign that the wise are just. This is indeed

12. I.e., the fully explicit deduction that is known to speakers and shapes their speech.
13. *APr.* 43^{b}32–36, *APo.* 87^{b}22–25.
14. The reference is unclear.
15. Both refer to a limit or end-point: "come to an end" is *peperasmenon*.

a sign, but it is refutable, even if true of the case mentioned; for it is non-deductive. But if someone were to say that there is a sign that someone is ill, for he has a fever, or that a woman has given birth, because she has milk, it is a necessary one. And among signs, this is precisely what proof alone is; for it alone, if true, is irrefutable. An example of signs related as universal to particular is if someone were to say that there is a sign that a person is feverish, for he is breathing rapidly. This too is refutable, even if true [of the person in question]; for it is possible to breathe rapidly and not be feverish.

What a likelihood is, then, what a sign is, and what a proof, and in what way they differ has now been stated. In the *Analytics*[16] we have defined them in a more explicit way, and what the cause is due to which some are non-deductive and others deductive.

We have said[17] that a paradigm is an induction and what sorts of things it is an induction about. It is not the relation of part to whole, of whole to part, or of whole to whole, but of part to part, and like to like—and it is a paradigm when both fall under the same kind, but one is better known than the other. For example, [someone might claim] that Dionysius is aiming at tyranny in demanding a bodyguard; for in fact Pisistratus, when aiming at tyranny previously, demanded a bodyguard and, having got one, made himself tyrant, and Theagenes did the same in Megara. And the others that [the listeners] know all become paradigms for Dionysius, of whom they do not yet know whether it is because of this that he demands a bodyguard. And all these fall under the same universal, that someone aiming at tyranny demands a bodyguard.

The things from which those means of persuasion that seem to be demonstrative
1358a1 are composed have now been stated.

There is a very great difference among enthymemes, however, that has indeed escaped the notice of pretty much everyone, even though the very same difference is also found in the dialectical methodical investigation of deductions;[18] for some enthymemes are in accord with rhetoric, just as some are in accord with the dialectical methodical investigation of deductions, while others are in accord with the other crafts and capacities, whether those in existence or those not yet acquired. That is why the difference escapes the notice of these individuals,[19] and the more they grasp in accord with a mode [of inquiry], the more they stray beyond these.[20] This will be more perspicuous if stated in more detail.

For I mean that dialectical and rhetorical deductions are those concerned with what we call "topics," which are common[21] when they concern what is just, what

16. *APr*. 2.27
17. 1356b14–15.
18. Reading ὥσπερ καὶ κατὰ τὴν διαλεκτικὴν μέθοδον τῶν συλλογισμῶν.
19. Secluding τοὺς ἀκροατὰς.
20. I.e., rhetoric and dialectic.
21. Reading κοινοὶ.

is natural, what is political, and many things that differ in form—for example, the topic of the more and the less; for it is no less possible to state a deduction or an enthymeme based on it about matters of justice than it is about matters of natural science, or about anything else whatever, and yet these things differ in form. Special topics, on the other hand, are the ones based on premises concerning a given form and kind. For example, there are premises concerning natural things on which neither an enthymeme nor a deduction can be based concerning ethical things, and about the latter there are others on which none can be based concerning natural ones. And the same holds in all cases. The common topics will not make someone wise about any kind; for they are not concerned with any underlying subject.[22] But as to the special ones, the better someone is at selecting premises, [the more] he will—without noticing it—produce a science that is distinct from dialectic and rhetoric; for if he hits upon starting-points, it will no longer be dialectic or rhetoric, but instead will be that science whose starting-points he possesses.

And yet most enthymemes are based on these, the so-called forms, the ones that are particular and special, fewer on the common topics. As in the *Topics*,[23] then, so also here a distinction must be made between the forms and the topics, on the basis of which enthymemes are selected. By "forms" I mean the premises special to a given kind, and by "topics" those equally common to all. We may begin, then, with the forms. But let us first take up the kinds of rhetoric, so that having determined how many they are, we may separately take up their elements and premises.

1.3
The Three Kinds of Rhetoric

The forms of rhetoric are three in number; for the listeners to speeches are of the same number; for a speech is composed of three elements: the speaker, what he speaks about, and whom he addresses. And the end it aims at relates to him—I mean, the **1358^{b}1** listener. And the listener must be either a spectator or a judge, a judge of either things past or things future. For example, an assemblyman is a judge concerning things future, a judge one concerning things past, and a spectator one concerning capacity.[24] So of necessity there would be three kinds of speeches belonging to rhetoric: deliberative, judicial, and epideictic.

A deliberative one is either exhortation or dissuasion; for both those who serve as private advisors and those who speak publicly in the common assembly always do one or the other of these. A judicial one is either accusatory or defensive; for it is necessary for the opponents to make one or the other of these. And an epideictic one consists in either praise or blame. Moreover, the times belonging to each of these

22. I.e., any kind (*Met.* $1016^{a}26$).
23. No such distinction is made in the extant *Topics*.
24. Reading ὁ δὲ περὶ τῆς δυνάμεως ὁ θεωρός.

are to the advisor, the future (for whether exhorting or dissuading he advises about future things); to the judicial speaker, the past (for it is concerning what has been done in action that he always accuses or defends); and to the epideictic speaker the present has the most control (for all speakers praise or blame with regard to qualities that belong at present), although they often also make use of past things by way of recalling them, and of future ones by way of anticipating them.

The end aimed at by each of them is distinct—that is, three for three: to the deliberative speaker the end is the advantageous and harmful (for the one who exhorts advises something as a better course, while the one who dissuades, dissuades from something as a worse one), and he includes the others—just or unjust, noble or shameful—as ancillary to this; to judicial speakers the end is the just and the unjust, and they too include the others as ancillary to these; and to those praising and blaming the end is the noble and the shameful, and they too take in the others as an assistant to these.

A sign that what has been mentioned is the end of each is that sometimes speakers might not dispute about the other things—for example, a judicial speaker might not dispute that he had done something or done harm, but he would never concede that he had done an injustice; for then there would be no need of a trial. Similarly, deliberative speakers, though they often let the other things go, would never concede that they are advising non-advantageous things or that they are dissuading from beneficial ones, but often they give no thought to [proving] it not unjust to enslave neighbors or those who have done no injustice. And similarly those who praise and blame do not investigate whether the person concerned has done advantageous things or harmful ones, but often take it as a matter for praise that, neglecting what was profitable to himself, he did something noble—for example, they praise Achilles because he went to the aid of his companion Patroclus,[25] knowing that he himself must die, though he could have gone on living. To him, a death of this sort was nobler, although the advantageous thing was to live.

It is evident from what has been said, then, that the speaker must first possess premises concerning these matters; for proofs, likelihoods, and signs are rhetorical premises, a deduction is wholly composed of premises, and an enthymeme is a deduction composed of the premises that were mentioned. And since it is not impossible things that will be done or can have been done through action, but rather possible ones, and since what has not occurred nor will occur can neither have been done nor will be done, it is necessary for the deliberative, judicial, and epideictic speaker to possess premises dealing with the possible and the impossible, and whether something has happened or not, or will or will not happen. Further, since all speakers, whether praising or blaming, exhorting or dissuading, accusing or defending, not only try to prove the things we mentioned but also that the good or the bad, the noble or the shameful, the just or the unjust, is great or small, either intrinsically

25. Homer, *Iliad* 18.94–137.

speaking or in comparison to each other, it is clear that it will be necessary also to possess premises dealing with greatness and smallness and the greater and the lesser, both universally and in particular—for example, what is the greater or lesser good, or unjust action or just action—and similarly for the others.

The things concerning which it is necessary to get hold of premises have now been stated. Next we must distinguish between each of them individually: what things deliberative speech is concerned with, what things epideictic speeches are concerned with, and third what things judicial speeches are concerned with.

1.4
Deliberative Oratory (1)

First, then, the sorts of good things and bad ones that the deliberative speaker gives advice about must be grasped, since it is not about all, but about those that may possibly come to be or may not, while about those that of necessity either are or will be, or that cannot be or come to be, there is no giving advice. Nor indeed is there any about all possible things; for some good things among those that can come to be, or not come to be, are by nature or by luck, and about those it does not at all further the work to give advice. But it is clear that there is giving advice concerning what we deliberate about: things that can naturally be brought back to ourselves, and whose starting-point of coming to be is up to us; for we investigate as far as this: until we discover whether something is possible or impossible for us **$1359^{b}1$** to do in action.

But to enumerate particular by particular in an exact way and divide into forms the things that people are accustomed to deliberate about in public, or to define them, as far as is possible where they are concerned, in accord with the truth, is not an inquiry we should undertake at the present moment, because this is not a matter for the craft of rhetoric—to which many more things than the ones within its own proper theoretical grasp are at present assigned—but for a more thought-involving and more truth-focused one; for precisely what we said previously[26] is true, that rhetoric is composed of the science of analytics and of ethics, and is like dialectic, on the one hand, and sophistical arguments, on the other. And to the extent that someone tries to establish dialectic or rhetoric not just as capacities but as sciences, to that extent he will—without noticing it—obscure their nature by the change, re-establishing them as sciences of certain underlying things, rather than only of arguments. Nonetheless, let us now discuss as much as it furthers the work to go through, while still leaving the investigation of the rest to the science of politics.

Indeed, of the things that all people deliberate about and deliberative speakers speak in the assembly about, pretty much the most important are five in number.

26. $1356^{a}25–26$.

And these are finances, war and peace, further, the defense of the country, imports and exports, and legislation.

So the one who is going to give advice about finances must know: what sorts of public revenues there are and how extensive they are, so that if any is omitted it may be added, and if any is too small it may be increased; further, all the expenses of the city, so that if any is superfluous, it may be eliminated, and if any is too large it may be reduced; for people become wealthier not only by adding to what they have, but also by eliminating expenses. It is not possible, though, from experience of matters relating to one's private affairs alone to get a comprehensive view of these; rather, it is necessary, with a view to giving advice about them, to be disposed to inquire about what has been discovered on the part of others.

As regards war and peace, it is necessary to know: the military capacity of the city, both how great it is already and how great it can become, of what sort it is and what else might be added to it; further, what wars it has waged and in what way. And it is necessary to know these not only about one's own city but also about bordering ones. And it is necessary to know with whom it is likely to have a war, in order that peace may be maintained with the stronger ones, and that war with weaker ones may be up to it. And one must know whether their military capacities are like or unlike [those of his own city]; for it is also possible to be advantaged or disadvantaged with respect to that. With reference to these matters too, it is necessary to get a theoretical grasp not only on the wars of his own city but also on those of others, and how they ended; for it is from like causes that like results naturally come about.

Further, in regard to defense of the country one must not overlook how it is to be defended, but one should also know the size of the defense force and its form, as well as the locations of the guardhouses (and this is impossible without having experience of the country), in order that it may be increased if it is too small, eliminated if superfluous, and suitable places kept a watch over instead.

Further, concerning nourishment, one must know how much is adequate for the city and of what sorts, whether coming from the city itself or importable, and which sorts should be exported and which sorts imported, in order that contracts and treaties with the relevant ones be made; for there are two one must closely guard the citizens from having disputes with: those that are stronger and those that are useful for the present purposes.

With a view to safety, it is necessary for [a deliberative speaker] to be capable of getting a theoretical grasp on all these things, but not least to have knowledge of legislation; for it is in the laws that the preservation of the city is based. So it is necessary to know how many forms of constitution there are, and what sorts of things are advantageous for each, and by what sorts—whether proper to it or the contrary—it is naturally destroyed. By "being destroyed by things proper to itself" I mean that except for the best constitution, all the others are destroyed by loosening or tightening—for example, democracy becomes weaker not only when loosened, so that finally it ends up being an oligarchy, but also when tightened to excess, just as

both a hook nose and a snub nose do not only reach the mean when loosened, but if they become exceedingly hooked or snub they are arranged in such a way that they do not seem to be a nose at all. In relation to legislation it is useful for the person who has a theoretical grasp on the matter not only to get knowledge of what constitution is advantageous on the basis of its past but also to know the constitutions present in others, that is, which ones are fitting for which sorts of people. So it is clear that, in relation to legislation, reports of world travelers are useful; for there one can get hold of the laws of [foreign] nations, and in relation to deliberations about war, the researches of those writing about actions. All these are a work of politics, however, not of rhetoric.

These, then, are the most important things that someone who is going to give advice must possess premises about. But let us now go back and state the ones on the basis of which one should exhort or dissuade on these and the other matters. **$1360^{b}1$**

1.5
Deliberative Oratory (2)

Both for each private individual and for all people in common there is pretty much a sort of target they aim at in what they choose and avoid. And this, to speak in headline form, is happiness and its parts. So, for the sake of having a paradigm, let us get hold of what happiness is, simply speaking, and of what its parts are composed; for every sort of exhortation and dissuasion is concerned with it and with the things that lead to it or are contrary to it; for the things that provide happiness or some part of it, or which produce more rather than less of it, are the things that one should do in action, while the things that destroy or impede it or produce the contraries [of it or its parts] are the ones that one should not do.

Let happiness, then, be doing well in action involving virtue, or self-sufficiency for living, or the pleasantest life involving security, or as abundance of possessions and bodies, involving the capacity to guard these and make use of them in action; for pretty much everyone agrees that happiness is one or more of these.

If, then, happiness is something of this sort, its parts must be good breeding, having many friends, having good friends, wealth, having good children, having many children, having a good old age; further, the virtues of the body (for example, health, noble beauty, strength, stature, athletic capacity), reputation, honor, good luck, virtue; for a person would be most self-sufficient if he had both the goods internal to himself and the external goods; for there are no others beyond these. (The internal ones are those relating to the soul and those in the body, while good breeding, friends, wealth, and honor are external.) Besides these we think that he should possess certain capacities and luck; for that way his life would be most secure. Let us now, in a similar way, get hold of what each of these is.

Good breeding in the case of a nation or a city, then, means that its members are indigenous or ancient, that its first leaders were distinguished men,[27] and that from them have sprung many who were distinguished for qualities we admire. The good breeding of an individual may result from the male side or from the female one, requires legitimacy [in birth and citizenship] on both, and—as in the case of a city—
35 that the earliest ancestors were notable for virtue, wealth, or something else that is highly esteemed, and that many distinguished people—men and women, young and old—come from the stock.

1361ᵃ1 Having good children and many children is quite clear. As regards the community, it consists in a large number of young people who are good—good in accord with virtue of body (such as stature, noble beauty, strength, and athletic capacity). As for the virtues [of a young person's] soul, these are temperance and courage. And for the individual, having good children and many children consists in having many
5 of his own and of the sort described, both female and male. In the case of female ones, virtue of body consists in noble beauty and stature, and of soul, in temperance and being industrious without being un-free. And alike for the individual and for the community, both with regard to women and with regard to men, each of these
10 qualities must be sought. For those, like the Spartans, in which the qualities of the women are bad, are pretty much half not happy.

The parts of wealth are a quantity of money, land, the possession of numerous large and nobly beautiful estates; further, possession of movables and of slaves and cattle distinguished by their number and noble beauty; and all these privately owned,
15 secure, free, and useful. And the things that are fruitful are more useful, while the things that are related to indulgence are more free. By "fruitful" I mean those that are sources of income; by "related to indulgence" I mean those from which nothing at all worth mentioning comes about beyond the use. The definition of "secure" is
20 what is possessed in such places and in such a way that the use of it is up to the owner himself. And whether something is privately owned or not is a matter of when its alienation is up to him, and by "alienation" I mean gifting or selling. And, in general, being wealthy consists more in using than in possessing; for in fact it is in the activation and use of such things that wealth consists.

25 Good reputation consists in being considered an excellent person by all, or having some quality of the sort that is sought by all, either by ordinary people, by the good, or by the practically wise.

Honor is a sign of a good reputation as a benefactor, and those who have been benefactors are justly honored above all; nonetheless, those who are capable of benefaction are honored too. Benefaction is either with regard to security [of life] and to
30 whatever is a cause of life, or to wealth, or to some other good things: those that are not easy to acquire, whether in general, in this particular place, or at this particular time; for many people gain honor for things that seem small, yet the places and the

27. Reading ἐπιφανεῖς.

opportune times are the causes of honor. The parts of honor are sacrifices, memorial inscriptions in verse or prose, privileges, grants of land, front seats, public burial, statues, public maintenance, the barbarian ones (for example, prostrations and standings aside), and gifts that are considered honors in the given place. For in fact a gift is the giving of a possession and a sign of honor, which is why both lovers of wealth and lovers of honor seek them; for the gift is to both of them what they want; for it is both a possession, which is sought by those who love wealth, and involves honor, which is **1361**^{b}**1** sought by those who love honor.

Virtue of body is health, and of such a sort that we are free from sickness when making use of our bodies; for many are healthy in just the way Herodicus was said to be, whom no one would count happy in matters of health, because they abstain from everything human, or nearly everything.

Noble beauty is a distinct thing at each stage of life. In a young man noble beauty consists in having a body useful for exertions, both for those related to the racecourse and those related to competitions requiring physical strength, and, in relation to indulgence, pleasant to look at. That is why pentathletes are the most nobly beautiful, in that they are naturally adapted for physical strength and for speed at the same time. In someone in his prime, noble beauty consists in being naturally adapted for the exertions of war, while having a pleasant and at the same time fearsome appearance. In an old man, it consists in being adequate for such exertions as are necessary, not painful [to look at] due to not having any of the disfigurements of old age.

Strength is the capacity to move something else in the way one wishes, and moving something else necessarily consists in pulling, pushing, lifting, squeezing, or crushing, so that someone strong is strong in all or some of these.

Virtue of stature consists in exceeding ordinary people in height, depth, and breadth, but in such a way that movements are not made slower due to the excess.

Virtue of body in athletic competitions is a combination of size, strength, and speed (and in fact the one who is speedy is strong); for in fact the one who is capable of throwing his legs in a certain way, moving them quickly and for a distance, is a good runner; the one who can squeeze and hold down is a good wrestler; the one who can thrust someone away with a blow of his fist is a good boxer; and the one who can do the latter two is a good pancratist; and the one who can do all of them is a good pentathlete.

A good old age consists in aging slowly and with freedom from pain; for no one who ages quickly is aging well, nor if he ages scarcely but painfully. And it comes from the virtues of body and from luck; for unless he is disease-free and strong, he will not be free from suffering and pain, nor will he without luck survive for a long time. There is, however, another sort of capacity for long life which is separate from both strength and health; for many are long-lived without the virtues of body, but an exact account of these things is not at all useful for present purposes.[28]

28. *Long*. 5, *Juv*. 24 (18).

Having many friends and having good friends are quite clear when the definition of friend is given, that a friend is the sort of person who for the sake of the relevant other is inclined to do in action the things that he thinks to be good for that other. Someone, then, for whom there are many people of this sort has many friends, and if they are also decent people, he has good friends.

Good luck consists in the acquisition and possession of either all, most, or the most important of those goods of which luck is the cause. But luck is a cause of some things that craft is a cause of too, and of many things that fall outside the province of craft, such as those of which nature is the cause (although it is also possible for luck to be contrary to nature); for craft is a cause of health, while nature is a cause of noble beauty and stature. In general, the goods that result from luck are the sort that envy is about. But luck is also the cause of good things that are beyond account—for example, if the other brothers are ugly, but one is beautiful; or when the others do not see the treasure, but one person finds it; or when the arrow hits a bystander, not the one aimed at; or if one who frequently visits a certain place was the only one who did not go, while those who were going for the first and only time were killed; for all such things seem to be cases of good luck.

As to virtue, since it most properly belongs with the topic of praises, it must be defined when we give an account of praise.[29]

1.6
Deliberative Oratory (3)

It is evident what things should be aimed at, as future ones or already existing, in exhortation and what in dissuasion; for they are contraries. And since the advantageous is set before the deliberative speaker as the target (for people deliberate not about the end but about the things that further the end, and these are the advantageous ones as regards actions), and the advantageous is a good, the elements of good and advantageous must be grasped in a simple way.

Let good, then, be whatever is choiceworthy for its own sake; or that for whose sake we choose something else; or what all things aim at, or all that have perception or understanding, or would aim at if they got understanding. And whatever understanding would assign to each, and what in particular cases it does assign to each, this for each is a good; also that due to whose presence something is well situated and self-sufficient; and self-sufficiency [itself]; and what is productive or preservative of these things; and what they follow along with; and what is preventative and destructive of their contraries. But things follow along in two ways: either simultaneously or subsequently. For example, while scientific knowing is subsequent to learning, living is simultaneous with being healthy. And things are productive in three ways: some

29. 1.9.

in the way that being healthy is of health; some as nourishment is of health; some as athletic training is, because it for the most part produces health.

With these things laid down, it necessarily follows that the acquisition of good things and the deliverance from bad ones are both good; for in the latter case not having the bad follows along simultaneously [with the deliverance from it], and in the former having the good does so subsequently [to the acquisition of it]. And the acquisition of a greater good than a lesser one, and of a lesser bad one than a greater, are both goods; for to the extent that the greater exceeds the less, to this extent there **1362**^{b}**1** is an acquisition of the one and deliverance from the other. Also, the virtues are necessarily a good; for those who possess them are well situated with regard to them, and virtues are both productive of good things and able to do them in action (we must speak separately[30] about what, and what sort of thing, each of them is). And pleasure is a good; for all animals by nature aim at it. So both pleasant things and noble ones are necessarily goods; for the former are productive of pleasure, while of the noble ones, some are pleasant, others intrinsically choiceworthy.

Speaking of them one by one, the following things are necessarily good: Happiness; for it is both intrinsically choiceworthy and self-sufficient and we choose [all] the other things for the sake of it. Justice, courage, temperance, greatness of soul, magnificence, and the other such states; for they are virtues of soul. Also health, noble beauty, and the like; for they are virtues of body, and productive of many [good] things—for example, health of pleasure and living, which is why it seems best, in that it is the cause of the two things most honored by most people: pleasure and living. Wealth; for it is the virtue of possession and productive of many [good] things. A friend and friendship; for a friend is intrinsically choiceworthy, and productive of many [good] things. Honor, reputation; for they too are pleasant and productive of many [good] things, and for the most part the actual possession of the things for which people are honored follows along with them. The capacity to speak and to do things in action; for all such things are productive of goods. Further, a good natural disposition, memory, ease at learning, acumen, and all such things; for these capacities are productive of goods. Likewise, all the sciences and the crafts. Also living; for even if no other good should follow, it is intrinsically choiceworthy. And justice; for it is something advantageous to a community.

These, then, are pretty much the agreed-upon goods. And in the case of the disputed ones, deductions are drawn from the following: That whose contrary is bad is good. Also, that whose contrary is advantageous to the enemies—for example, if to be cowardly is especially advantageous to their enemies, it is clear that courage is especially beneficial to the citizens. And, in general, the contrary of what enemies wish for or enjoy appears beneficial. That is why it is said: "Now might Priam rejoice."[31] But this is not always so, though it is so for the most part; for nothing prevents the same

30. 1.9.
31. Homer, *Iliad* 1.255.

thing from sometimes being advantageous to both sides. Which is why it is said that
1363ᵃ1 evils bring people together when the same thing is harmful to both.

And what is not in excess is good, and whatever is greater than it should be, bad. Also, that for whose sake much labor has been spent and many expenses incurred is good; for it is already an apparent good, and such a thing is taken to be an end, and an end of many endeavors, and the end is a good. Which is why it is said: "They would leave to Priam to glory over . . . ," and "It is disgraceful to wait long. . . ."[32] Also the proverb about the pitcher at the door.[33] And what many people aim at, and what is manifestly fought over; for the good, we saw, is what all aim at, and many seems like all. Also what is praised; for no one praises what is not good. And what enemies, especially the base ones,[34] praise is good; for just like everyone they already agree that it is, if even those who are badly affected [praise it];[35] for it is because of its being quite evident that they would agree to it, just as they would that those people are base whom their friends blame and their enemies do not blame. That is why the Corinthians took it that they had been abused by Simonides when he wrote the verse: "Ilium does not blame the Corinthians."[36] Also, what one of the practically wise or one of the good men or good women has preferred, as Athena preferred Odysseus[37] and Theseus Helen,[38] and as the goddesses preferred Paris[39] and Homer Achilles.[40]

And, in general, the things that are deliberately chosen are good. And people deliberately choose to do the things that were mentioned, as well as those that are bad for their enemies and those that are good for their friends, that is, those that are possible. But the latter are twofold: things that might be brought about and things that are easily brought about. And the easy ones are those doable without pain or in a short time; for difficulty is defined either in terms of pain or of length of time.

Also, anything that comes about as people wish—and they wish either for nothing bad or less bad than good (and this will be the case if the cost[41] is unnoticed or slight). And things that are special to someone, or that no one else wishes to do, or that are extraordinary; for that way the honor is greater. And things that are fitting for them, and whatever in respect of their family or capacity is fitting for them is like this. Also, the things they think they are lacking in, even if small; for nonetheless they deliberately choose to do [what will get] them. And things that are easy to

32. Homer, *Iliad* 2.160, 298.
33. Having carried it from the well, don't break it at the door.
34. Reading καὶ οἱ φαῦλοι.
35. If enemies, even base or ignoble ones, praise a thing, that is a strong rhetorical basis for arguing that it is good.
36. Fr. 67 Page.
37. Homer, *Odyssey* 1.44–63, 13.299–440.
38. Isocrates, *Helen* 18–22.
39. Homer, *Iliad* 24.25–30. The goddesses are Aphrodite, Hera, and Athena. What they preferred was to have Paris judge their relative beauty.
40. Homer, *Iliad* throughout.
41. Reading ἐὰν ἡ τιμωρία.

do; for being easy they are also possible (and the ones easily done are the ones that everyone, ordinary people, or people like or inferior to themselves have successfully accomplished). Also, things that will please their friends or annoy their enemies. And whatever those they admire deliberately choose to do in action. Also, what they are naturally well-disposed toward and experienced in; for they think they will easily succeed in accomplishing them. And the things no base person does; for these are more praiseworthy. Also, whatever they happen to have an appetite for; for it appears not only pleasant but also better. And above all for each group that with reference to which he is a lover of such things—for example, lovers of victory if it will be victory, lovers of honor if honor, lovers of wealth if wealth, and the others likewise. **1363^{b}1**

As regards the good and the advantageous, then, it is on these that we should base our means of persuasion.

1.7[42]
Deliberative Oratory (4)

Since people often agree that both of two things are advantageous but dispute about which one is more so, something must next be said about the greater good and the more advantageous.

Let exceeding, then, be being as great as plus something further, and let being exceeded be being contained; let greater and more always be what is so in relation to less, while great, small, much, and little are what are so in relation to the size of most things (with great being what exceeds it, while what falls short is small), and much and little likewise.

Since, then, we call "good" what is itself choiceworthy for its own sake and not for the sake of something else, and what all things aim at, and what something with understanding and practical wisdom would choose, and what is productive and protective of or follows along with these, and since the end is the for-the-sake-of-which, and what the other things are for the sake of is an end,[43] and since to an individual himself a good is what has received these affections in relation to himself, it necessarily follows that more is a greater good than one or fewer, provided that the one or the few are counted within it; for it exceeds and what is contained is exceeded. And if what is greatest [in one form] exceeds what is greatest [in another], the one [form] exceeds the other; and when the one [form] exceeds the other, the greatest in one exceeds the greatest in the other. For example, if the greatest man is greater than the greatest woman, in general, men are greater than women too; and if, in general, men are greater than women, the greatest man is also greater than the greatest woman; for the excess of the forms is proportional to that of the greatest in them.

42. Cf. *Top*. 3.1–5.
43. Reading τὸ δ᾽οὗ ἕνεκα τὸ τέλος ἐστί. τέλος δ᾽ἐστὶν οὗ ἕνεκα τὰ ἄλλα.

And whenever this would follow that, but that would not follow this (and it follows either simultaneously, subsequently, or potentially), [then that is greater than this;] for the use of the latter is already contained in the former. Living follows being healthy, but not vice versa, and does so simultaneously; scientific knowing follows learning and does so subsequently; and stealing follows violating a holy place and does so potentially; for someone violating a holy place might also steal from it.

And when two things exceed the same thing, the one that exceeds it more is a greater good; for it necessarily also exceeds the lesser of the greater [pair]. And things that are productive of greater goods are greater ones; for this, we saw,[44] is what it is to be greater by way of being productive of the greater. Likewise, the good whose producer is greater; for if being healthy is more choiceworthy than being pleased and a greater good, then health is also a greater good than pleasure.

Also, what is intrinsically choiceworthy is a greater good than what is not intrinsically so, as, for example, strength than what is health-giving; for the latter is not so for its own sake, while the former is so for its own sake—which, as we saw,[45] is precisely what the good is. And what is an end is a greater good than what is not an end; for the latter is choiceworthy for the sake of something else, the former for its own sake—for example, athletic training for the sake of having a body in good condition. Also, what has less need of a second thing or[46] of other things is a greater good; for it is more self-sufficient (and to have less need is to need fewer things or things easier to get). And when this cannot exist or come to be without that, while the latter can exist or come to be without the former[, the latter is a greater good]; what does not have the need is more self-sufficient, then, so that it appears to be a greater good.

Also, if something is a starting-point and the other not a starting-point, it is a greater good, or—due to the same consideration—if the one is a cause and the other not a cause; for without a cause and a starting-point being or coming to be is impossible. And if there are two starting-points, what comes from the greater starting-point is greater; and if there are two causes, what comes from the greater cause is greater. And the reverse, of two starting-points, the starting-point of the greater is greater, and of two causes, the cause of the greater is greater. It is clear, then, from what has been said, that a thing appears greater in two ways; for in fact if one thing is a starting-point and the other is not a starting-point, the former seems to be greater, and likewise if one is not a starting-point, but the other is[, the former seems to be greater]; for the end is greater and not a starting-point. Thus Leodamas said, when accusing Callistratus, that the one who gave the advice did a greater injustice than the one who did the action; for the action would not have been done had the other not given the advice. On the other hand, when accusing Chabrias, he also said the reverse, that the one who did the action did a greater injustice than the one who had

44. 1363ᵇ15.
45. 1363ᵇ12–14.
46. Reading ἢ.

given the advice; for it would not have occurred if there had not been the doer of the action; for this is what plotting is for the sake of, for people to act on it.

Also, what is rarer is a greater good than what is abundant, as gold is than iron, though less useful; for acquisition of it is a greater thing due to its being more difficult. In another way, the abundant is a greater good than the rare, because use is superior [to non-use]; for often is superior to seldom. Which is why it is said: "Water is best."[47] And, in general, the more difficult is a greater good than the easier; for it is rarer. In another way, the easier is a greater good than the more difficult; for it is how we wish it to be.

Also, that whose contrary is greater is itself greater, and that whose privation is greater. And virtue is greater than non-virtue and vice than non-vice; for the one is an end and the other is not an end. Also, those things of which the works are nobler or more shameful are themselves greater. And of those things whose virtues and vices are greater, the works are also greater, if indeed as the starting-points and causes are, so too are the consequences. And as the consequences are, so too are their causes and starting-points. Also, those things whose superiority is more choiceworthy or nobler. {For example, seeing with exactness is more choiceworthy than smelling with exactness; for sight is also more choiceworthy than smell; and to love companions is far more noble than to love wealth, so that love of companions is also nobler than love of wealth.}[48] Conversely, the better things are, the better their superiority is, and the more noble they are, the more noble it is. So too the objects of nobler and better appetites; for greater desires are for greater things. Also, due to the same considerations, appetites for nobler or better things are nobler or better.

1364^{b}1

And things of which the sciences are nobler or more excellent are nobler or more excellent things; for as the science stands so too does the reality; for each prescribes in its own area of it. And the sciences of more excellent and nobler things are proportional, due to the same consideration. And what the practically wise—either all, many, most, or the most excellent—would judge or have judged to be the good or the greatest good[49] must be such, either unconditionally or insofar as they made their judgment in accord with practical wisdom. This applies in common to other matters too; for something also is what it is, is a quantity, or is a quality, in the way in which scientific knowledge and practical wisdom would affirm it to be. We have said this in the case of goods; for we defined[50] that to be good which each and every thing, if it had acquired practical wisdom, would choose. It is also clear, then, that a greater good is one that practical wisdom more [firmly] asserts to be one. Also, what belongs to better people, either unconditionally or insofar as they are better [is a better good], as courage is better than strength. Also, what a better person would choose, either

47. Pindar, *Olympian* 1.1.
48. Probably out of place.
49. Reading ἀγαθὸν ἢ μεῖζον.
50. 1363^{b}12–15.

unconditionally or insofar as he is better, such as to suffer injustice rather than to do injustice; for this is what the more just person would choose.

Also, the more pleasant than the less pleasant; for all pursue pleasure, and desire to be pleased for its own sake, and it is in terms of this[51] that the good and the end were defined.[52] And something pleasant that is more free from pain and longer lasting is more pleasant. Also, the more noble than the less noble; for the noble is either the pleasant or the intrinsically choiceworthy. And things people wish to be more of a cause of, either to themselves or to their friends, are greater goods, and what they wish to be least of all a cause of, greater evils. Also, things that last a longer time rather than those that last a shorter time, and more secure ones than less secure ones; for the use of things that last a longer time is superior in regard to time and the use of things that are more secure is superior in regard to wish; for the secure one is readier for use whenever people wish.

Also, just as certain things would follow along from[53] co-ordinates[54] and similar inflections, so there are other things that follow along as well—for example, if what is done courageously is nobler than and more choiceworthy than what is done temperately, courage is more choiceworthy than temperance, and being courageous than being temperate.

And what is chosen by all is better than what is not chosen by all, and what more choose than fewer; for good, we saw,[55] is what all aim at, so that a greater one is what they aim at more. And what opponents or enemies [so choose], or judges, or those whom judges judge [to be competent]; for in the former two cases it would be as if all people would say so, and in the latter two as if those in control or those who know would. And sometimes what all share in is greater; for it would be a dishonor not to share in it. But sometimes it is what no one else or a few share in; for it is rarer.

Also, things that are more praiseworthy; for they are nobler. And things for which the honors are greater, in a similar way; for an honor is like a sort of estimate of worth. Also, things for which the punishments are greater. Also, things that are greater than those that are agreed to be or that are apparently greater. Also, the same things when divided into their parts appear to be greater; for there seems to be superiority in a greater number of things. Which is why the poet too says that Meleager was persuaded to rise up [by the thought of]

> All the sorrows that come to people whose city proper is taken:
> The people perish, and fire leaves the city in ashes,
> And strangers lead the children away.[56]

51. Reading αὑτοῦ.
52. 1363b12–13.
53. Reading καὶ ὡς ἂν ἐκ.
54. *Top*. 2.9.
55. 1363b14.
56. Homer, *Iliad* 9.592–594.

Also, combination and building to a climax, as Epicharmus does, [is greater] both because this is the same as division (for combination shows great superiority) and because it makes something appear to be a starting-point and cause of great things.

And since the more difficult and rarer is greater, so opportune times, stages of life, places, the times, and capacities make things great; for if someone does something beyond his capacity, his stage of life, or what his equals do, and in such a way, or in circumstances, or at a time, the action will get great stature among actions that are noble, good, just, and their contraries. Hence the epigram on the Olympian victor:

> In the past, with a rough yoke on my shoulders,
> I used to carry fish from Argos to Tegea.[57]

And Iphicrates praised himself, saying: "Look what I started from."[58] Also, what is self-grown is greater than what is acquired; for it is more difficult—which is why the poet too says: "But I am self-taught."[59] Also, the greatest part of what is great is greater—for example, Pericles said in his funeral oration[60] that the young men were taken from the city: "As if the spring had been taken from the year." And things that are useful in greater need are greater—for example, those in old age or in illnesses. Also, of two goods, the one closer to the end. And the one for the individual himself than the unconditional one. And the possible one than the impossible one; for the former is good for the individual himself, while the latter is not.

And things included in the end life aims at; for the end is a greater good than what is close to the end. Also, things related to truth than things related to seeming. And the definition of what is related to seeming is what a person would not choose if he were going to escape notice. That is why for someone to have a good done to him seems to be more choiceworthy than to do a good; for a person will choose the former even if it escapes notice, but it seems that no one would do good were it to escape notice. Also, what someone wishes to be than what he wishes to seem; for the former is more related to truth. That is why people say that even justice is a small thing, because it seems to be more choiceworthy rather than being more choiceworthy. But this is not the case with being healthy.

Also, what is useful for more things—for example, for living and living well and pleasure and doing noble things. That is why wealth and health seem to be the greatest goods; for they possess all these qualities. And what is freer from pain and what involves pleasure; for these are more than one thing, so that pleasure is present as a good as well as painlessness. And of two goods, the one that when added to the same thing makes the whole greater is more choiceworthy. And things whose presence does

57. Attributed, with doubtful warrant, to Simonides.
58. $1367^{b}18$ quotes this in a fuller form.
59. Homer, *Odyssey* 22.347.
60. Probably the one given in Athens in 431 BC in honor of those killed in the first year of the Peloponnesian War. Also $1411^{a}2$–4.

not escape notice are greater than those whose presence does; for they tend toward the truth. That is why being wealthy would appear to be a greater good than seeming to be so. Also, what is beloved and what to some people is beloved alone while to others is possessed together with other things [would appear to be a greater good than what is not]. That is why the punishment is not the same if one blinds a one-eyed person as if one half blinds a person with two eyes; for in the first case one takes away what is beloved.

The things, then, on which the means of persuasion should be based in exhortation and dissuasion have pretty much been stated.

1.8
Deliberative Oratory (5)

The greatest and most controlling of all things as regards being capable of persuading and giving good advice is to get a grasp on all constitutions and to distinguish the characters,[61] customs, and advantages of each. For all people are persuaded by what is advantageous, and what preserves the constitution is advantageous. Further, the declaration of the controlling element is controlling, and the controlling elements differ in accord with the constitutions; for there are as many controlling elements as there are constitutions. And there are four constitutions: democracy, oligarchy, aristocracy, and monarchy, so that the controlling and deciding element would either be some part of these or the whole.

Democracy, then, is a constitution in which offices are distributed by lot; oligarchy one in which it is on the basis of a property assessment; and aristocracy one in which it is in accord with education. By "education" I mean that laid down by law; for in an aristocracy it is those who have remained true to the laws who rule. And they necessarily appear best (*aristos*), and it is from this that the constitution has taken its name. And monarchy, in accord with its name, is a constitution in which one person is in control of all. And of monarchies, the one that is in accord with some order is a kingship, while the indefinite one is a tyranny.

And the end aimed at by each constitution should not be overlooked [by the deliberative speaker;] for people choose what furthers the end. The end aimed at by democracy is freedom; by oligarchy, wealth; by aristocracy, things concerned with education and customs; and by tyranny, keeping guard. It is clear, then, that it is as things related to the end aimed at by each constitution that one should distinguish characters,[62] customs, and advantages, if indeed it is in relation to this that people make their choices. Since, then, means of persuasion come about not only through demonstrative argument but also through argument expressive of character (for we

61. Reading ἤθη.
62. Reading ἤθη.

are persuaded by a speaker due to his appearing to be of a certain quality, that is, if he appears good, goodwilled, or both), we should have at hand the characters belonging to each constitution; for the character belonging to each is necessarily most persuasive to each. And these characters will be grasped by means of the same things; for characters are made apparent in accord with deliberate choice, and deliberate choice is referred back to the end.

It has now been stated what things should be sought as future or present ones, while we are engaged in exhortation, and from what we should take their means of persuasion about the advantageous; further, through what and in what way we will be well equipped as regards the characters and the customs belonging to constitutions, so far as is suited to the present occasion; for an exact examination of these matters is given in the *Politics*.[63]

1.9
Epideictic Oratory

Next let us speak about virtue and vice, noble and shameful; for these are targets for the one who is praising and blaming. In speaking of these, we will at the same time in fact coincidentally make clear those things on the basis of which we will be taken to be people of a certain sort in accord with our character, which was just the second sort of means of persuasion; for it is on the basis of the same things that we will be capable of making both ourselves as well as someone else worthy of trust with regard to virtue. But since it happens that people, both in jest and in all seriousness, often praise not only a human being or a god but also inanimate things or a random animal, we must in the same way get hold of premises concerning these. So, to the extent necessary for the sake of having a paradigm, let us speak about these matters too.

The noble, then, is that which, being choiceworthy because of itself, is praiseworthy, or which, being good, is pleasant because it is good. And if this is what the noble is, it is necessary for virtue to be something noble; for it is praiseworthy because of being good. And virtue is a capacity, so it seems, capable of supplying goods and of preserving them, and a capacity productive of many and great benefactions—actually, of all of them in all cases. The parts of virtue are justice, courage, temperance, magnificence, greatness of soul, generosity, mild-manneredness, practical wisdom, and theoretical wisdom. But it is necessary for the greatest virtues to be those that are most useful to others, if indeed virtue is a capacity productive of benefaction. Because of this, people most honor the just and the courageous; for courage is useful to others in war, and justice is useful in peace as well. Next is generosity; for the generous spend freely and do not compete about money, which is what other people aim at most of all.

63. Especially 3.7–18, 4.2–16, 5.5–12.

Justice is the virtue due to which each has his own, and as law [prescribes], while injustice is that due to which he has what is another's, not as law prescribes. Courage is the one due to which people are capable of doing noble works in the midst of dangers, both as law prescribes and in submission to it; cowardice the contrary. Temperance is the virtue due to which people are disposed in the way that the law prescribes in relation to the pleasures of the body; intemperance the contrary. Generosity is the disposition to do good things in money matters; acquisitiveness the contrary. Greatness of soul is virtue productive of great benefactions; magnificence is virtue productive of greatness in matters of expenditure; the contraries are smallness of soul and niggardliness. Practical wisdom is virtue of thought in accord with which people are capable of deliberating well with a view to happiness about the goods and evils we mentioned.

About virtue and vice universally, then, and about their parts, enough has been said for the purposes of the present occasion, and the other things are not difficult to see; for it is clear that the things productive of virtue must be noble (for they further virtue), as must the things that are brought about by virtue, and both the signs and works of virtue are like this. But since the signs and such things as are the works done or things undergone that are characteristic of a good person are noble, it is necessary for whatever are the works of courage, signs of courage, or actions done courageously to be noble. Also just actions and works done justly (although not things justly undergone; for in the case of this virtue alone "justly" is not always noble, rather, in the case of being punished, to undergo it justly is more shameful than to do so unjustly). And with regard to the other virtues it is the same way.

Also, those things are noble for which the rewards are honor; and those for which the rewards are honor rather than money. Also, whatever choiceworthy things someone does not for his own sake. Also, unconditionally good things, and whatever someone has done for his country, disregarding his own interest. And things that are good by nature, and not [simply] good for himself; for the latter are the sort done for his own sake. And whatever can belong to a person when he is dead more than when he is alive; for what belongs to a person when he is alive has more the character of being for his own sake. And whatever works are for the sake of others; for they are less for the sake of himself. Also, whatever things are done well in relation to others but not in relation to oneself. And those works that relate to benefactors; for it is just to do them. Also benefactions; for they are not directed to oneself. Also, things that are the contraries of things that people are ashamed of; for they are ashamed of saying, doing, or intending to do shameful things, as when Alcaeus said: "I wish to say something, but shame prevents me." Sappho in fact replied:

> If you had a longing for the good and the noble,
> And if your tongue had not stirred up some bad thing to utter,
> Shame would not have filled your eyes,
> But you would speak about what is just.[64]

64. Fr. 137 Lobel & Page. Alcaeus' words are probably also part of the poem.

Also, those things are noble for which people compete without fear; for this is what one is feeling in relation to good things that conduce to reputation. And the virtues and actions of those who are by nature more excellent are more noble—for example, those of a man than those of a woman. Also, those for the indulgence of others rather than ourselves (that is why the just and justice are noble).

Also, to take revenge on enemies and not be reconciled; for to retaliate is just, and what is just is noble, and not to give way is characteristic of a courageous man. Also, victory and honor are among the noble things; for they are choiceworthy even if purposeless, and reveal a superiority of virtue. And things that are memorable, and the more so more. And the ones that follow a person when he is not alive and that honor follows,[65] the extraordinary ones, and the ones that belong to only one person are more noble; for they are easier to remember. As are possessions that are purposeless; for they are freer.

Also, the things special to each people are noble, and whatever are signs of the things praised among them—for example, in Sparta long hair is noble; for it is a sign of freedom; for it is not easy with long hair to do any work characteristic of a hired laborer. Also, not to work at any unrefined craft is noble; for it is characteristic of a free person not to live in dependence on others.

We should also take it that qualities that are closely allied to the actual ones are the same as them for the purposes of both praise and blame—for example, that a cautious person is cold and calculating, and that a silly one is kindly, and an unfeeling one calm. And [when praising] one should always take each of the qualities that follow along in the best sense (for example, one should take an irascible and enthusiastic person to be simple, and a surly one to be magnificent and dignified) and take those given to excess as [really] being in the virtuous condition (for example, a rash one as courageous, and a wasteful one as generous); for this will seem so to ordinary people, and at the same time is [a paradigm of] a fallacious argument proceeding from the cause; for if a person faces up to danger when it is not necessary, he will seem much more likely to do so wherever it is noble, and if he is lavish with random people, he will seem much more likely to be so with friends; for to do good for everyone is superiority of virtue.

One should also investigate whom the praise is in front of; for, as Socrates said,[66] it is not difficult to praise Athenians among Athenians. And one should speak of whatever is honored among each lot as actually present in [the one being praised]—for example, among Scythians, Spartans, or philosophers. And, in general, one should draw what is honored toward what is noble, since indeed they seem to be neighbors.

Also, all such things as are in accord with what is fitting are noble—for example, if they are worthy of someone's ancestors or his past achievements; for to acquire additional honor has the stamp of happiness and is noble. Also, something is noble if

65. Reading καὶ ἡ τιμὴ ἀκολουθεῖ.
66. Plato, *Menexenus* 235d. 1415^{b}30–33 repeats and expands.

it goes beyond what is fitting but toward the better and the nobler—for example, if someone is moderate in times of good luck, but great-souled in times of bad luck, or if, when he becomes greater, he is better and more open to reconciliation. Iphicrates' remark "Look what I started from to arrive here" is like this, as is that of the Olympic victor "in the past, with a rough yoke on my shoulders . . . ,"[67] and of Simonides "she whose father, husband, and brothers were tyrants."[68] Since praise is based on actions, however, and to act in accord with deliberate choice is a special characteristic of an excellent person, one should try to prove that the person [one is praising] is acting in accord with deliberate choice, and it is useful that it should appear that he has done so often. That is why one should take coincidences and things that happen by luck as due to deliberate choice. For if many similar cases are adduced, they will seem to be a sign of virtue and deliberate choice.

Praise is speech that makes the greatness of virtue apparent.[69] Hence one should prove that the person's actions have been of the requisite sort. An encomium, on the other hand, is concerned with works.[70] Circumstances, such as good breeding and education, contribute to persuasion; for it is likely that good people will come from good people and that people brought up in a certain way will be of the relevant sort. That is why we bestow encomia on those who have done some action.[71] And the works are signs of the state, since we would praise even someone who had not done any [similar] action, if we were persuaded that he was of the sort to do it. Blessing people and felicitating them are the same as each other, though not the same as praise and encomium, but rather just as happiness encompasses virtue, so felicitation encompasses these.[72]

Praise and speeches of advice belong to a common form, since the things one might propose in advising become encomia when their expression is changed. When, then, we have in hand what actions should be done and what sort of person someone should be, we ought to state these as proposals by changing and turning their expression. For example, "one ought not to think highly of what is due to luck but of what is due to oneself." When expressed in that way it is equivalent to a proposal, while as praise it is expressed this way: "He thinks highly not of what comes due to chance but due to oneself."[73] So, when you wish to praise, see what you would propose; and when you wish to make a proposal, see what you would praise. But the expression

67. 1365a26–27.

68. A fuller version of the story, without attribution, explains: "The dust covers Archedice daughter of Hippias, the best man in Greece of his time; though her father, husband, brothers, and sons were tyrants, her mind did not puff itself up with vanity" (Thucydides 5.59).

69. This paragraph and the next are repeated at 1416b29, where all editors mark a lacuna.

70. Reading τὸ δ' ἐγκώμιον τῶν ἔργων ἐστίν.

71. Reading διὸ καὶ ἐγκωμιάζομεν πράξαντας.

72. Reading μακαρισμὸς . . . περιέχει ταῦτα.

73. Isocrates, *Evagoras* 45.

will of necessity be the opposite when a preventative proposal and a non-preventative proposal are altered.

One should also use many means of amplification. For example, if the person is the only one, or the first one, or one of the few, or the one who has most of all done something; for all these are noble. Also, things based on times and opportunities—that is, if these go beyond what is fitting. Or if the person has often been successful in the same accomplishment; for that is a great thing and would seem to be not the result of luck but due to the person himself. Also, if incentives to achievement and awards of honor have been invented and established because of him. And if he was the first to whom an encomium was made, as in the case of Hippolochus,[74] and in that of Harmodius and Aristogeiton, for whom statues were set up in the marketplace. And likewise in the case of the contraries. And if one is not well equipped as regards the person himself, compare him with others, precisely as Isocrates used to do because of his familiarity with judicial oratory. Also, one should compare him to reputable people; for this is a means of amplification and noble, if he is better than the excellent ones.

Amplification quite reasonably falls within the means of praise; for it involves [showing a] superiority, and superiority is included among the noble things. That is why, even if not to the reputable ones, one should compare the person to ordinary people, if indeed the superiority does seem to indicate virtue. In general, among the forms of things common to all speeches, amplification is best suited to the epideictic ones (for these take up actions that are agreed upon, so that what remains is to bestow greatness and noble beauty on them); paradigms to deliberative ones (for we judge future things by divining them from past ones); and enthymemes to judicial ones (for what has happened, because of its lack of perspicuousness, is most of all receptive of a cause and a demonstration).

These, then, are the things on which speeches of praise and blame are pretty much all based, as well as the ones to look to when praising or blaming, and the things from which encomia and reproaches are produced; for if we have these in hand, their contraries are evident; for blame is based on the contraries.

1.10
Judicial Oratory (1)

We have to speak next about accusation and defense, and from how many and from what sorts of things deductions should be produced. One should, then, get hold of three things: first, what things and how many of them people do injustice for the sake of; second, in what way these people are disposed; third, the sorts of people they do **1368^{b}1**

74. Reading καὶ εἰς . . . οἷον εἰς Ἱππόλοχον.

injustice to and their condition. Let us discuss these in order after first defining what doing injustice is.

Let doing injustice, then, be doing harm voluntarily contrary to the law. And law is either special or common. By "special" I mean the written law by which people are governed; by "common" I mean whatever unwritten ones seem to be agreed to among all. And people do voluntarily whatever they do knowingly and without being compelled. But of the things they do voluntarily, not all are deliberately chosen, but those that are deliberately chosen are all done knowingly; for no one is ignorant of what he has deliberately chosen. Vice and lack of self-control are the things due to which people deliberately choose to do harm and do evil contrary to the law; for if certain people have one sort of depravity or more than one, it is with respect to the depravity they happen to have that they are also doers of injustice. For example, the ungenerous does injustice concerning money; the intemperate concerning the pleasures of the body; the soft concerning comfort; and the cowardly concerning dangers; for they abandon their comrades in danger because of fear.[75] The lover of honor does injustice, because of honor; the quick-spirited one, because of anger; the lover of victory, because of victory; the bitter person, because of revenge; the one who lacks practical wisdom, because of being mistaken about what is just and unjust; the shameless one, because of contempt for reputation; and likewise each of the others with respect to its underlying sort of depravity.

But this will be clear, partly from what we said about virtues, and partly from what we will say about feelings.[76] It remains to state what people do injustice for the sake of, in what way they are disposed, and to whom they do it.

First, then, let us go through what people desire and what sorts of things they are avoiding when they put their hand to doing injustice; for it is clear that the accuser must investigate the number and the sorts of things belonging to the opponent that all are aiming at when they do injustice to their neighbors; and the defendant, the number and sorts of these that do not belong.

All people, then, do all things either not due to themselves or due to themselves. Among the ones that are not due to themselves, they do some due to luck, others due to necessity, and of those due to necessity, some occur by force, some by nature. So all the things that people do that are not due to themselves are in some cases the result of luck, in some occur by nature, and in some by force. But whichever ones are due to themselves, and of which they themselves are the causes, are in some cases due to
1369a1 habit and in some due to desire, and of those due to desire some are due to rationally calculative desire and some to non-rational desire. In one case, then, there is wish, a desire for some good (for no one wishes for something except when he thinks it is a good), while anger and appetite are non-rational desires. Thus all the things that

75. Reading τοὺς γὰρ . . . τὸν φόβον.
76. 2.1–11.

people do they of necessity do due to seven causes: due to luck, nature, force, habit, rational calculation, spirit, or appetite.

To further divide these in accord with stage of life, state [of character], or other things related to action is superfluous; for if the young happen to be prone to anger or appetite, they do not do actions of this sort due to their youth, but due to anger and appetite. Nor is it due to wealth or poverty—rather, the poor happen to have an appetite for money due to their lack of it, while the rich happen to have an appetite for unnecessary pleasures due to their abundant resources. But these people too will do the actions they do, not due to wealth or poverty but due to appetite. Similarly, both the just and the unjust, and the others said to do the actions they do in accord with their states [of character], do them due to the same causes; for they do them either due to rational calculation or due to feeling, although some due to excellent characters and feelings, some due to the contrary ones. Of course, it is a fact that states of one sort are followed by one sort of action, and of another sort by another sort; for excellent beliefs and appetites concerned with pleasures follow immediately and in like manner for the temperate person due to his being temperate as the contrary ones do for the intemperate person concerning the same things. That is why, though these sorts of divisions must be put aside, we must investigate which sort usually follows which sort; for if someone is pale or dark, big or small, nothing is regulated so as to follow from such things, while if someone is young or old, just or unjust, it immediately makes a difference. And, in general, [we must investigate] whatever coincidental things make the characters of people different—for example, seeming to oneself to be rich or poor will make some difference, or to be lucky or unlucky. We will discuss these issues later on,[77] but now let us speak first about what remains.

The sorts of things that are the result of luck are the ones whose cause is indefinite, which do not occur for the sake of anything, or always, or for the most part, or in some orderly way (all this is clear from the definition of luck); those that are by nature are the ones whose cause is within themselves and is orderly; for they always or for the most part occur in the same way. As for those that occur contrary to nature, nothing need be argued in an exact way as to whether they are in accord with nature or due to some other cause; but luck would also seem to be a cause of such things. By force are whatever things come to be, contrary to their appetite or their rational calculation, through[78] the doers themselves. Things that occur by habit are whatever things people do due to having done them often. Things that occur due to rational calculation are the things that seem to be advantageous on the basis of the goods mentioned,[79] either as an end or as what furthers an end, whenever they are done for the sake of the advantage; for the intemperate also do advantageous things, not because of their being advantageous, but because of pleasure. Things that occur due to spirit or anger

77. 2.12–17.
78. Reading δι'.
79. 1.6.

are acts of revenge. (Revenge and punishment are different; for punishment is for the sake of the sufferer, revenge for the sake of the doer, in order that he get satisfaction. What anger is will become clear in the discussion of the feelings.[80]) What is due to appetite is whatever is done that appears pleasant. The customary and the habitual are included among the pleasant things; for people even do with pleasure many things that are not by nature pleasant when they have become habituated to them.

So, by way of summary, whatever things people do due to themselves are all either good or apparently good, pleasant or apparently pleasant. And since they do voluntarily whatever they do due to themselves, and not voluntarily whatever is not due to themselves, everything they do voluntarily would be either good or apparently good, pleasant or apparently pleasant; for I place the removal of evils and apparent evils, or the exchange of lesser for greater ones, among the good things; for they are, in a way, choiceworthy. And I likewise place among the pleasant ones, the removal of pains or apparent pains, and the exchange of a greater pain for a lesser. We must, therefore, get hold of advantageous things and pleasant ones, both how many they are and of what sorts.

We spoke previously[81] about the advantageous in the case of deliberative oratory; let us now speak about the pleasant. And we should consider our definitions as adequate in each case if they neither lack perspicuousness nor are [too] exact.

1.11
Judicial Oratory (2)

Let us assume, then, that pleasure is a sort of movement of the soul, an intensive and perceptible settling down into its original natural state, and pain the contrary. And if pleasure is something like this, it is also clear that pleasant is what is productive of
1370ᵃ1 the condition that was mentioned, and what is destructive of it or is productive of the contrary settling down is painful. Thus movement into the condition that is in accord with nature is necessarily pleasant for the most part, and especially whenever what comes about in accord with nature has recovered its own natural state.

Also, habits are pleasant; for the habitual has already become natural, as it were; for habit is something like nature; for in fact what occurs often is close to what occurs always, and nature belongs with always, habit with often. Also, what is not forced is pleasant; for force is contrary to nature—which is why what involves necessity is painful, and why it has been correctly said that "every necessary thing, indeed, has a troublesome nature."[82] Also, things that require supervision, effort, and exertion are painful; for these too involve necessity and are forced, unless people become habituated to them; then habit makes them pleasant. But their contraries are

80. 1378ᵃ31–33.
81. 1.6.
82. Evenus of Paros, F8 West.

pleasant—which is why comforts, exemptions from toil, exemptions from supervision, amusements, relaxations, and sleep are among the pleasant things; for none of these is against necessity.

{Also, everything for which we have an appetite within us is pleasant; for appetite is a desire for what is pleasant. Among appetites, some are non-rational, while others involve reason. By "non-rational ones" I mean those where people have an appetite not on the basis of taking something to be the case. Those that are by nature said to be of this sort, like those that are present in us through the body—for example, for nourishment, thirst and hunger,[83] and for a particular form of nourishment, a particular form of appetite; those connected with taste, sexual pleasures, and, in general, with objects of touch; and those of smell, hearing, and sight. Those that involve reason, on the other hand, are those which people have an appetite for on the basis of being persuaded; for there are many things that people have an appetite to look at or acquire after hearing about them and being persuaded.}[84]

Since being pleased consists in perceiving a certain feeling, and imagination is a sort of weak perception, and some sort of imagination of what he remembers or expects always[85] follows along in the person expecting or remembering, then, if all this is so, it is clear that pleasure too follows along simultaneously in those remembering and expecting, if indeed perception also does. So it is necessary that all pleasant things are either present (in the perceiving), or past (in the remembering), or future (in the expecting); for people perceive present things, remember past ones, and expect future ones. Hence memories are pleasant, not only about things that were pleasant in the present in which they took place, but sometimes even about some unpleasant things if their subsequent results were noble and good. Which is why too it has been said, "but pleasant it is when rescued to remember one's sufferings"[86] and "for afterward a man rejoices at his pains, when he remembers them, one who suffers much and much accomplishes."[87] The cause of this is that not having a bad thing is also pleasant. And those expected things are pleasant that appear to confer great delight or benefit when present, or to benefit without pain. In general, things that give delight when present are for the most part pleasant both when we expect them and when we remember them. That is why even being angry is pleasant, as Homer too said when he wrote about spirit that it "is much sweeter than dripping honey";[88] for no one is angry at someone on whom it is apparently impossible to take revenge, nor at those who are greater than themselves in capacity, [that is,] either they feel no anger or less anger.

Also, a sort of pleasure follows along with most appetites; for people enjoy a certain pleasure when they remember that they got something or anticipate that they

83. Reading δίψα καὶ πεῖνα.
84. Probably out of place.
85. Reading κἀεὶ ἐν.
86. Euripides, *Andromeda*. Fr. 131 Nauck.
87. Homer, *Odyssey* 15.400–401.
88. Homer, *Iliad* 18.109. Quoted more fully at 1378^{b}5–7.

will get it. For example, those in a fever, during their attacks of thirst, enjoy both remembering having drunk and anticipating drinking. And lovers always enjoy discussing things, writing, and doing something concerning the beloved; for in all such things, by remembering, they think they perceive, as it were, their beloved; for the starting-point of love is the same for all: when they not only enjoy the beloved when he is present, but also enjoy remembering him when he is absent; and they are in love also when there is pain at his absence. So too in the same way there is a certain pleasure that attaches to mourning and lamentation for a departed one; for there is pain at his not being there and pleasure in remembering and, in a way, seeing him, the actions he was doing, and what he was like. That is why it made perfect sense to say, "Thus he spoke, and stirred in all of them the longing for weeping."[89]

Also, getting revenge is pleasant; for if something is such that not getting it is painful, getting it is pleasant, and angry people who do not get revenge are unsurpassably pained, while they enjoy anticipating it. And victory is pleasant, not only for those who love victory, but for all; for an appearance of superiority results, which all have an appetite for, whether mild or more intense. And since victory is pleasant, amusements must also be pleasant, both warlike ones and contentious arguments (for victory often occurs in these), as must games of knucklebone, ball, dice, and checkers. It is the same as regards more serious amusements; for some become pleasant when one is accustomed to them, while others are pleasant from the outset, such as tracking with dogs and every sort of hunting; for where there is a contest, there is victory too. That is why judicial oratory and contentious argument are pleasant to the habituated and capable.

And honor and good reputation are among the pleasantest things, because in each case an appearance results of having the qualities of an excellent person, and all the more when others that the person thinks to be truthful say so. (And of the latter sort are those close to him rather than the ones at a distance; the familiar ones and his fellow citizens rather than those from far away; his contemporaries rather than future people; practically wise people rather than those without practical wisdom; and many rather than few; for those mentioned are more likely to be truthful than their contraries.) Since one cares nothing about the honor or opinion of those one greatly despises, such as children or beasts, at any rate, not for the sake of one's reputation, but rather if indeed one does, it is because of something else.

Also, a friend is among the pleasant things; for loving is pleasant (for no one is a wine lover who does not enjoy wine) and so is being loved; for in being loved too there is an appearance that one is oneself the possessor of the goodness that all those who perceive [it] have an appetite for; since to be loved is to be liked because of oneself. And to be admired is pleasant because it is the same thing as being honored. And to be flattered and have a flatterer is pleasant; for a flatterer is an apparent admirer and an apparent friend.

89. Homer, *Iliad* 23.108, *Odyssey* 4.183.

Also, to do the same things often is pleasant; for, as we saw,[90] what one is accustomed to is pleasant. And [then] change is pleasant; for change is to one's natural state; for always doing the same thing produces an excess of the state settled down into. Hence the saying "In all things change is sweet."[91] Because of this, what comes at intervals is also pleasant, whether people or things; for there is change from what is present, and at the same time what comes at intervals is also rare.

Also, to learn and to wonder is for the most part pleasant; for in wondering there is an appetite for learning, so that what one wonders at one has an appetite for, and in learning there is a settling down into what is in accord with nature. And to do good and to have good done to one are pleasant things; for to have good done to one is to attain what you have an appetite for, and to do good implies both having and superiority, both of which people aim at. And because being productive of good is **1371b1** pleasant, so too it is pleasant for people to rectify their neighbors and make up for their deficiencies. And since to learn is pleasant and to wonder [at things], so too other things are necessarily pleasant—for example, what is imitative (like the crafts of painting, sculpture, and poetry) and everything that is well imitated, even if what is imitated is not pleasant; for it is not it that one enjoys, but there is a deduction that this is that, so that the result is that one learns something. Also, reversals[92] and narrow escapes from danger [are pleasant]; for all of these excite wonder. And since what is in accord with nature is pleasant, and those that are of the same kind are related to each other in accord with nature, all things that are of the same kind and alike are for the most part pleasant to each other—for example, human to human, horse to horse, and youth to youth. Hence the proverbs: "Peer delight peer," "Like to like," "Beast knows beast," "Birds of a feather flock together," and other such things.

But since all that is like oneself or the same in kind is pleasant to oneself, and each person feels this pleasure above all in relation to himself, necessarily all are more or less self-lovers; for all such things belong, in the highest degree, to his relation to himself. And since all are self-lovers, necessarily the things that are their own are also pleasant to them all—for example, their works and words. That is why people for the most part are lovers of flatterers, of lovers, of honors, and of children; for children are their own work. And to make up for deficiencies is pleasant; for then the thing becomes their own work. {And since to rule is most pleasant, seeming to be theoretically wise is also pleasant; for what exercises practical wisdom is fitted to rule, and theoretical wisdom is the scientific knowledge of many wondrous things.}[93] Further, since people are for the most part lovers of honor, it is necessary that it is pleasant to criticize one's neighbors, and to rule [in that way]. Also, to spend time at what one seems to oneself to be best in is pleasant, as the poet too says:

90. 1369b16–18.
91. Euripides, *Orestes* 234.
92. *Po.* 1452a22–24.
93. Probably out of place.

Toward this he presses hard,
To this each day allots the biggest part—
What he is indeed the best in.[94]

Similarly, since amusements are among the pleasant things, every sort of relaxation is too. And since laughter is among the pleasant things,[95] necessarily ridiculous things (whether people, words, or works) are as well. The ridiculous has been discussed separately in the *Poetics*.[96]

About pleasant things, then, let this much be said; those that are painful will be evident from the contraries of these.

1.12
Judicial Oratory (3)

These, then, are things for the sake of which people do injustice; let us now discuss the way in which they are disposed and whom they do injustice to.

People do injustice, then, whenever they think that it is possible to do the thing at issue and possible for them to do it—whether they think either that their action will escape notice, or that if it does not escape notice, it will not be given a trial, or that if it is given one, the penalty will be less than the profit to themselves or to those for whom they care. What sorts of things appear possible or impossible will be discussed later[97] (for they are common to all speeches).

Those who do injustice think that they can especially do so without penalty when they are capable speakers, [effective] doers of action, and experienced in many [political] debates, and if they have many friends, and if they are rich people. And they especially think they can do so if they themselves are among those mentioned; but if not, if they have friends, assistants, or partners like this; for due to these they can [effectively] do actions, escape notice, and not be punished. Also, if they are friends of those being treated unjustly or of the judges; for friends are not on guard against being treated unjustly and, besides, they attempt reconciliation before undertaking to prosecute; and judges favor those they are friends with, and either wholly acquit them or impose a small penalty.

The ones likely to escape notice are the ones who are the contraries of the accusations—for example, a weak person concerning assault, and a poor or ugly one concerning adultery. Also, those who do things very much in the open and in the public eye (for they are not guarded against; for no one at all would think them possible), or things that are so great or of such a sort that no one person [would

94. Euripides, *Antiope.* Fr. 183 Nauck.
95. Reading καὶ ὁ γέλως τῶν ἡδέων.
96. 1449ᵃ32–37, F167.
97. 1392ᵃ8–ᵇ14.

be thought capable of them]; for these things are not guarded against either; for all guard against the usual unjust actions, which is also the case with illnesses, but illnesses that no one at all has ever been ill with no one takes precautions against. Also, those who have either no enemies or many; for the former think they will escape notice because they are not being guarded against, while the latter escape notice because it does not seem that they would attempt to attack those on their guard, and because they have as their defense that they would not have attempted it. And those who have ways or places of concealment, or abundant opportunities for disposal [of stolen property].

Also, those who do not escape notice but can have the trial put aside or postponed for a long time, or corrupt the judges. And those who, if a penalty is imposed, can get full payment put aside or postponed for a long time. Or if, due to lack of means, the person has nothing to lose. Also, those for whom the profits are evident, large, or immediate, while the penalties are small, un-evident, or remote. {And the one for whom the retribution is not equal to the benefit, as seems to be the case with **1372b1** tyranny.}[98] Also, those for whom the unjust actions bring solid gains, while the only penalties are mere reproaches; and, contrariwise, those whose unjust actions tend to involve some praise, for example, if the person happened at the same time to have taken revenge for a father or mother, as in the case of Zeno,[99] while the penalties tend to involve fines, exile, or something of that sort; for people do injustice for either reason and in either condition [of mind], yet they are not the same, but rather contrary, in character.

Also, those who have often escaped notice or gone unpunished; and those who have often been unsuccessful; for there are even some in cases like these, as, among the warlike, who are ready to renew the fight. And those for whom the pleasure is immediate, while the pain is later, or where the profit is immediate, while the penalty is later (for those who lack self-control are like that, and lack of self-control is concerned with everything they desire); and, contrariwise, those for whom the pain or the penalty is immediate, while the pleasure and benefit are later and more lasting (for those who are self-controlled and those who are more practically wise pursue such things).

Also, those who may possibly seem to have acted due to luck, necessity, nature, or habit, and, in general, to have committed an error but not an injustice. And those for whom there is a chance of decent consideration. And those in need; but one is in need in two ways: for need is either a matter of necessity, as in the case of the poor, or of excess, as in the case of the rich. Also, those who are very reputable, and those who are very disreputable—the former because they are not suspected, the latter because they will not be any more suspected than before.

98. Probably out of place.
99. Reference uncertain.

When disposed in these ways, then, people attempt to do injustice, and they do injustice to people of the following sorts and regarding things of the following sorts: Those who have something they need, either as necessities, or as excess, or for indulgence, whether they are far away or close by; for in the latter case the getting is fast, and in the former the retribution is slow, as if the [Greeks] were to plunder the Carthaginians. Also, those who are not cautious nor on their guard, but trusting; for it is easy to take all these unawares. And those who are careless; for prosecuting is characteristic of a careful person. Also, those who are prone to shame; for they are not likely to fight over profits. And those that have been treated unjustly by many but have not prosecuted them; for these are, as the proverb goes, "Mysian spoil."[100] Also, those who have never, and those who have often, been so treated; for both are off their guard—the former, because it has never happened, the latter because it surely would not happen again. And those who have been accused or it is easy to accuse; for such people, as hated and resented, neither deliberately choose [to prosecute], for fear of the judges, nor are capable of persuading them. And those against whom they have the pretext that their ancestors, they themselves, or their friends treated badly, or were going to treat badly, either the doers of the injustice themselves, their ancestors, or those for whom they care; for as the proverb says, "A pretext is the only thing wickedness needs." Also, their enemies and their friends; for the latter is easy, and the former pleasant. And those who are friendless, or not clever either in speaking or in action; for they either do not attempt to prosecute, or seek reconciliation, or accomplish nothing. And those for whom there is nothing to gain from spending time keeping an eye on the trial or the full payment of the fine, for example, foreigners and the self-employed; for they resolve the case for a small sum and readily cease the proceedings. Also, those who have done many unjust actions, or of the same sorts as are being done to them; for it almost seems not to be an injustice when someone is done an injustice of the same sort as the injustice he is accustomed to do to others. I mean, for example, if someone treats a person in an insulting way who is accustomed to committing wanton aggression. Also, those who have done evils to them, or wished, wish, or are about to do them; for it includes something both pleasant and noble and appears close to not doing an injustice. And those by doing injustice to whom they gratify friends, those they admire or love, those in control, or, in general, those they live in dependence upon. And those with regard to whom there is a chance of decent consideration. And those against whom they have made complaints and had previous differences, as Callippus did in the Dion affair; for even things like that appear close to not doing an injustice. And those to whom others are going to do injustice, if they themselves do not do so first, on the supposition that it is no longer possible to deliberate, as Aenesidemus is said to have sent the prize in a game of *kottabos* to Gelon after the latter had enslaved the city, because he had done first what Aenesidemus himself was going to do. Also, those whom, after doing them

100. Easy prey. The source of the proverb is unclear.

the injustice, they can do many just things for, on the supposition that they will thus easily repair it, as Jason the Thessalian said that he had to do some unjust things in order to be capable of also doing many just ones.

Also, [people do injustice regarding] things of the sort that all or many are accustomed to do; for they think they will get sympathetic consideration. And regarding things easy to hide, and of the sort that are quickly consumed, such as the edible ones. Or those that are easy to change in color, shape, or by mixing, or those that it is easy to conceal in many places. Such things include those that can be easily carried or concealed in small places, and those that are indistinguishable from or similar to many that the doer of the injustice already had. Also, things that those treated unjustly are ashamed to mention—for example, acts of wanton aggression against the women of their household, or against themselves or their sons. And those the prosecutor of which would seem litigious, and those that are small or which merit sympathetic consideration are like this.

The ways, then, in which those who do injustice are disposed, what sorts of unjust actions they do and to what sorts of people, and due to what, are pretty much these.

1.13
Judicial Oratory (4)

Let us now determine all the unjust actions and all the just actions, starting first with the following points. The just actions and the unjust actions, then, have been defined in relation to two sorts of laws and in two ways in relation to persons. I mean that law is on the one hand special and on the other hand common, the latter being unwritten, the former written, and special being what each [community] has defined relative to itself, and common what is in accord with nature. For there is what all people, even if they do not share any community whatever with each other or any contracts, divine that there is: a common justice and injustice that is by nature. For example, this is what Antigone in Sophocles' play is manifestly speaking about when she says that it is just, though forbidden, to bury Polyneices, since this is just by nature: **1373b1**

> For not just now or yesterday, but always, ever
> Lives this [law], and no one knows whence it appeared.[101]

And, as Empedocles says about not killing an animate thing; for this is not just for some and unjust for others:

> What is lawful for all extends continuously
> Through the wide-ruling ether and through the immense light of the sun.[102]

101. *Antigone* 456–457.
102. B135 DK.

And as Alcidamas says in the *Messianicus*, ["god has made all people free; nature has made none a slave"].[103]

And in relation to persons, law is divided in two ways, for what one should do or not do is defined in relation to the community or in relation to an individual member of the community. That is why unjust actions and just actions are a matter of doing injustice and acting justly in two ways, either in relation to a single and definite individual or in relation to the community; for to commit adultery or to strike a blow is to do injustice to some definite individual, while refusing to serve in the army is to do injustice to the community.

With this division, then, of all the unjust actions, some being in relation to the community, others in relation to one person or in relation to several persons, let us take the matter up again and state what it is to be treated unjustly. To be treated unjustly, then, is to suffer unjust actions at the hands of someone who does them voluntarily; for doing injustice was previously defined[104] to be voluntary. And since the one treated unjustly must be harmed, and harmed involuntarily, such harmful actions are evident from our previous discussion (for intrinsic goods and evils have been discussed previously, as have things that are done voluntarily, that they are the ones done knowingly), so that all accusations must be either in relation to the community or in relation to the private individual, the accused having acted either ignorantly and involuntarily or voluntarily and knowingly, and in the latter case some from deliberate choice and others due to feeling. Spirit will be spoken about[105] in the account of the feelings; and what sorts of things people deliberately choose and the way they are disposed were spoken about earlier.[106]

But since people often agree that they have done the action but do not agree with the indictment or what the indictment is about—for example, to have taken something, but not to have stolen it; to have struck the first blow, but not to have committed wanton aggression; to have had sexual relations, but not to have committed adultery; to have stolen something, but not to have committed sacrilege (for it did not belong to a god); to have trespassed, but not on public land; or to have had discussion with enemies, but not to have committed treason. Because of this, definitions should be given of these things: what theft is, what wanton aggression is, and what adultery is. That way if we wish to prove that an offense has or has not been committed, we will be able to make evident what is just. And in all such cases the dispute is about whether the accused is unjust and base or not unjust; for depravity and injustice lie in the deliberate choice, and all such names—for example, wanton aggression and theft—signify deliberate choice in addition [to the action]; for if someone has struck another a blow, he has not in all cases committed wanton aggression against him, but rather if he has done so for the sake of something—for

103. The missing text is supplied from a scholiast.
104. 1368b6–7.
105. 2.2.
106. 1368b28–1369a7, 1.11–12.

example, to dishonor the other or to please himself. Nor in all cases, if he took something by stealth, has he stolen it, but rather if he took it for the purpose of harm and for his own use and advantage. It is the same with the others as it is with these.

But since, as we saw,[107] there are two forms of just and unjust actions (for some are written, others unwritten), and the ones the laws proclaim have been spoken about, two forms of [such actions as determined by] unwritten laws remain. On the one hand, these are the ones that are in accord with a superiority of virtue or vice, for which there are reproaches and praises, dishonors and honors, and rewards—for example, being grateful, or doing good in return for good, to a benefactor, helping one's friends, and other such things. On the other hand, they are the ones omitted by the special written law. For decency seems to be something just, and decency is justice that lies beyond the written law. These omissions are sometimes voluntary on the part of legislators and sometimes involuntary. They are involuntary whenever something escapes their notice, voluntary whenever they cannot define something [exactly], but, on the one hand, it is necessary to speak in universal terms, and, on the other, the definition does not hold universally, but rather for the most part. Also, wherever it is not easy to give a definition due to the unlimitedness [of the possibilities], for example, the size and sort of iron implement to be used in a case of wounding; for a lifetime would not suffice to enumerate them completely. If the action, then, is something that cannot be [exactly] defined, but a law must be established, it is necessary to speak unconditionally, so that if someone wearing a ring raises his hand or strikes a blow, according to the written law he will be liable and have done injustice, while in truth he has not done injustice; and this is decency. **1374^{b}1**

If, then, decency is what was stated, it is evident what sorts of things are decent and what sorts not decent, and what sorts of people are not decent; for cases in which there should be sympathetic consideration are cases for decency, and it consists in not judging errors and unjust actions as deserving of the same [penalty], or strokes of bad luck either. Strokes of bad luck are whichever ones are contrary to reasonable expectation and do not result from depravity; errors are whichever ones are not contrary to reasonable expectation and do not result from depravity; and unjust actions are whichever ones are not contrary to reasonable expectation and do result from depravity. Also, to make allowances for human weaknesses is decent. As is looking not to the law but to the legislator; not to the word but to the thought of the legislator; not to the action but to the deliberate choice; not to the part but to the whole; and not to what sort the person is now but to what sort he has been always or for the most part. Also, to remember good things received rather than bad ones, and good things received rather than good ones done. And to show restraint when one is treated unjustly. And to be willing to be judged by word rather than by work. And to wish to go into arbitration rather than to trial; for the arbitrator looks to what is decent,

107. E.g., 1373^{b}2–6.

while the judge looks to the law. Indeed, it was for the sake of this that arbitrators were invented, that decency prevail.

As regards decent things, then, let them be determined in this way.

1.14
Judicial Oratory (5)

An unjust action is greater insofar as it results from a greater [state of] injustice; that is why the least one may be the greatest—for example, the accusation of Callistratus against Melanopus, that he defrauded the officials in charge of temple upkeep of three consecrated half-obols. But in the case of justice it is the contrary. This[, that the least may be the greatest,] is so because the greatest is potentially present in the least; for the one who has stolen three consecrated half-obols would do any injustice whatever. Sometimes, then, the greater is judged in this way, sometimes from the harm [done].

Also, [an unjust action is greater] where there is no equal penalty but all are too little. And where there is no remedy; for it is difficult, indeed impossible [to find a remedy]. And if the sufferer of the injustice cannot get a trial; for then the injustice is not remediable; for a trial and a punishment is a remedy. And if the sufferer, that is, the person who has been treated unjustly, inflicted some great punishment on himself; for then the doer of the injustice would justly be punished with a yet greater one—for example, Sophocles, when pleading on behalf of Euctemon, who had cut his own throat after the wanton aggression he had suffered, declared that he would not assess the penalty at less than the sufferer had assessed for himself.

Also, when someone is the only, the first, or among the few, to have done it. And to commit the same error often is a great thing.[108] Also, when due to it preventions and penalties have been sought and discovered—for example, in Argos a person is penalized due to whom a law was set up, as are those due to whom a prison was built.[109] And an unjust action is greater, the more beast-like it is. Also, the more premeditated it is. And what those who hear about it fear more than pity. (And the rhetorically relevant facts are of the following sort: that the person has abrogated or exceeded many [parts of] justice—for example, oaths, handshakes, promises, marriage agreements; for this is an excess consisting of many unjust actions.)

Also, those that occur in a place where doers of injustice are being punished—which is precisely what perjurers do; for where would they not do injustice, if they do it even in court? And things in which there is the most shame. And if done to someone who has done good to him; for he does more injustice, in that he does bad and also in that he does not do good. And the person who contravenes the unwritten

108. Reading μέγα.

109. Nothing is known about these events.

parts of justice [is more unjust]; for it is characteristic of a better person to be just without being compelled, and the written parts compel, while the unwritten ones do not. But he is so, in another way, if he contravenes the written ones; for the unjust person who does unjust actions that involve fears and punishments would also do them were they punishment-free.

About greater and lesser unjust action, then, let this much be said.

1.15
Judicial Oratory (6)

Following what has been said we have now to run through the means of persuasion that are called "outside the province of craft"; for they are special to judicial speeches. They are five in number: laws, witnesses, contracts, [results of] torture, and oaths.

First, then, let us speak about laws, and in what way they should be used in exhorting and dissuading and accusing and defending. For it is evident that if the written law is contrary to the thing at issue, one should use common law and what is decent as being more just. And [one should say] that "the best consideration"[110] requires this: not to use the written law point by point. And that the decent always remains and never changes, and neither does the common law (for it is in accord with nature), while the written ones often do. Hence what is said in Sophocles' *Antigone*; for Antigone defends herself for having buried Polyneices contrary to the law of Creon, but not contrary to the unwritten one, by saying,

> For not just now or yesterday, but always, ever **1375b1**
> . . .
> This I was not likely [to break] because of any man.[111]

And that the just is something true and advantageous, but what [only] seems to be so is not, so that neither is the written law; for it does not always do the work of law. And that the judge is like the assayer of silver, because he distinguishes counterfeit justice from true justice. And that it is characteristic of a better man to use and abide by the unwritten laws rather than the written ones.

Also [one should look to see] whether the [written] law is in some degree contrary to popular law, or if it is even contrary to itself; for sometimes one law prescribes that contracts be binding, while another forbids making contracts contrary to the law. And if it is ambiguous, so that one can turn it about and see which construal will fit either what is just or what is advantageous, then this is the construal to use. And if

110. Athenian judges swore an oath whose gist seems to have been something like this: "I will cast my vote according to the laws and using my most just consideration."
111. Sophocles, *Antigone* 456, 458; 1373b12 quotes ln. 457.

the circumstances that led to setting up the law no longer remain in place but the law does, one should try to make this clear, and fight against the law by means of it.

If, on the other hand, the written law looks to the thing at issue, one should say that [the oath requiring] "the best consideration" is not there for the sake of judging contrary to the law, but in order that, if the judge is ignorant of what the law says, he does not violate his oath. Also, that no one chooses what is unconditionally good, but what is good for himself. And that there is no difference between a law's not being laid down and its not being used. And that in the other crafts there is no profit in being "wiser than the doctor"; for an error on the part of a doctor does not do so much harm as getting in the habit of disobeying the ruler. And that to seek to be wiser than the laws is the very thing that is forbidden in the laws that are praised. As regards the laws, let things be determined in this way.

As for witnesses, witnesses are of two sorts: the ancient ones and the recent ones. And of the latter, some share in the risk, while others are outside it. By "ancient" I mean the poets and other notable people whose judgments are available—for example, the Athenians used Homer as a witness concerning Salamis,[112] and the Tenedians recently used Periander of Corinth against the Sigeans.[113] And Cleophon used the elegies of Solon against Critias, saying that the loose living of his family was ancient; for otherwise Solon would never have written, "Tell the fair-haired Critias from me to listen to his father."[114] Such witnesses, then, are concerned with past events, while interpreters of oracles are concerned with future ones. For example, Themistocles said that "the wooden wall" meant that a naval battle must be fought. Further, proverbs, as has been said,[115] are witnesses. For example, if someone advises against making a friend of an old person, the proverb "never do good to an old person" testifies to this. And if he advises doing away with children after having done away with the fathers, "foolish is he who having killed the father leaves behind the sons."[116]

Recent witnesses are notable people who have given a judgment about something (for their judgments are indeed useful to those disputing about the same things)—for example, Eubulus, when attacking Chares in court, made use of what Plato said against Archibius, that "confessions of wickedness have increased in the city."[117] Also, those who share in the risk, if they seem perjurious. Such people are witnesses only as to whether something has happened or not, or is or is not the case; they are not witnesses as to the quality of the action—for example, whether it was just or unjust,

112. In the struggle between Athens and Megara for possession of Salamis, Solon allegedly cited Homer, *Iliad* 2.557–558, which suggests that Salamis had ancient ties to Athens.
113. The event is otherwise unknown.
114. Fr. 22a West.
115. This has not been said explicitly, but may be implied at 1363a5–7, 1371b14–17.
116. *Cypria* Fr. 31.
117. The allusion is unclear. The idea may be this: Chares confessed to wickedness, hoping thereby to lesson his penalty. Eubulus points out that the use of such a tactic is on the rise and should not be tolerated, citing Plato in support.

advantageous or disadvantageous. Outsiders are most persuasive[118] also about such matters; but most persuasive are the ancient witnesses; for they are not corruptible.

The one who has no witnesses as confirmation of testimony should say that judgment must be made on the basis of likelihoods, and that this is what "the best consideration" requires. And that it is not possible for likelihoods to deceive for a sum of money. And that likelihoods are not convicted of perjury. The one who has witnesses should say to the one who does not have them that likelihoods are not liable to trial, and that there would be no need for witness if it were enough to consider [the case] on the basis of the arguments.

Some pieces of testimony are about oneself, others about the opponent, and some are about the thing at issue, others about character, so it is evident that there is never a scarcity of useful testimony; for if there is no testimony relating to the thing at issue, whether agreeing with oneself or contrary to the opponent, still there will be some about character, whether pointing to one's own decency or one's opponent's baseness. Other points about a witness—whether he is a friend, an enemy, or in between, whether he is reputable, disreputable, in between, and all other such differences—should be based on the very same topics on which we state enthymemes.

As regards contracts, the use of arguments extends this far, to amplifying or reducing, that is, making them persuasive or unpersuasive—if on one's side, persuasive and in control, if on the opponent's, their contraries. With a view to establishing their persuasiveness or un-persuasiveness, they are no different than dealing with witnesses; for whatever sorts of people signatories and custodians are, in these reside the persuasiveness of the contracts.

If it is agreed that a contract exists, this should be amplified if on one's side; for a contract is a law applying to individuals and particular cases, and while contracts do not make the law to be in control, the laws do make contracts that are in accord with the laws to be in control, and, in general, the law itself is a sort of contract, so that whoever disobeys a contract or does away with it, it is the laws that he does away with. Further, many transactions, especially the voluntary ones, are carried out in accord with contracts, so that if these are without control, the business relations of people with each other are done away with. And the other things that are fitting [to say] are easy to see.

If the contract goes contrary to oneself and along with the opponents, then, in the first place, the things that are fitting [to say] are the very ones that one might use to fight against a contrary law; for it would be absurd if we think, on the one hand, that we must not obey the laws whenever they are not correctly laid down but those who put them in place erred, and, on the other, that it is necessary to obey contracts. Second, one can say that the judge is an umpire of what is just; he must consider, then, not this [written contract], but as [construed] in the more just way. And say that while it is not possible to alter what is just by deception or compulsion (for it is

118. Reading πιστότατοι.

something natural), contracts are among the things that come about both through people being deceived and through their being compelled. In addition, one should look to see whether the contract is contrary to any written or common laws, and in the case of written ones, whether to domestic ones or to foreign ones, and next whether it is contrary to other contracts, whether later or earlier; for one should look to see whether the later are the controlling ones (but the earlier ones without control),[119] or whether the earlier ones are correct (but the later ones are deceptive)—whichever of the two may be useful. Further, one should see what is advantageous—whether the contract is in any way contrary to the interests of the judges, and anything else like this; for these things too are similarly easy to see.

Results of torture are a sort of evidence and seem to carry conviction, in that a sort of compulsion is also involved. And it is not difficult in their case, either, to state the possibilities [regarding their use] on the basis of which to provide amplification, if the results of torture are on one's side, [by saying] that they are the only sorts of testimony that are true. But if they go contrary to oneself and along with the opponent, one could refute them by stating the truth generally about the kind to which the results of torture belong; for people speak falsely no less than truly when being tortured, whether through resilience they obstinately refuse to speak the truth, or readily tell lies to stop the torture more quickly.[120] And one must be able to refer to paradigms of this sort of thing that have actually happened and are known to the judges.

As regards oaths, there is a fourfold division to make: either to offer one and accept one; do neither; do one but not the other (and of these, to offer but not accept, or accept but not offer). Further, in another way, beyond these, there is the question of whether an oath was already sworn either by oneself or by the other party.

If one does not offer, one can say that people swear false oaths easily; that the one who has sworn will not pay, while those who have not sworn, one thinks, will be condemned [by the judges]; and that this risk will be better, the one in the hands of the judges; for one trusts them, not the opponent.

If one does not accept an oath oneself, one can say that an oath is a substitute for money, and that if one were a base person, one would have accepted it (for it is better to be base for something than for nothing, and one who accepts the oath wins the case, while the one who does not accept it does not), and so one's not swearing an oath would be due to virtue, not to [a fear of] committing perjury. And Xenophanes' remark is fitting, that "a challenge to accept an oath made to a pious man is not itself the equal of one made to an impious man."[121] Rather, it would be like a strong person challenging a weak one to strike a blow or be struck one.

If one does accept an oath, one can say that one trusts oneself, not the other. And, reversing the remark of Xenophanes, one should say that this way it is equal, if the

119. Reading ἄκυροι δ'αἱ πρότεραι.
120. Reading τἀληθῆ and ἤ τἀληθῆ.
121. A14 DK.

impious person offers and the pious one swears. And that it would be terrible to be unwilling to swear an oath oneself on matters that one thinks it fitting for others to judge after swearing one.

If one offers an oath, one can say that it is pious to be willing to turn the matter over to the gods, and that there is no need for the opponent to require other judges; for one is offering him the judgment. And that it would be absurd not to be willing to swear about things we demand that others swear about.

But since it is clear how one should speak in each of these cases, it is also clear how one should speak when they are coupled—for example, if one wishes to accept but not to offer, if one wishes to offer but not accept [an oath], and if one wishes to accept and offer, or to do neither; for these are necessarily composed of the ones discussed, so that the arguments too are composed of the ones discussed.

And if one has already taken an oath, and an oath contrary [to the present case], one should say that it is not perjury; for while doing injustice is voluntary, and committing perjury is doing injustice, what is done due to force or deception is involuntary. Here one must conclude that perjury too is something committed by thought, not by mouth. If, on the other hand, the oath is contrary to the opponent's case and has been sworn by him, one should say that those who do not abide by what they have sworn do away with everything (for this is in fact why judges take an oath before administering the laws): "my opponents demand that you abide by the oaths you swore you would judge by, while they themselves do not abide by theirs." And there are many other things one might say by way of amplification.

BOOK 2

2.1
Rhetoric Is for the Sake of Judgment

These, then, are the things on the basis of which one should exhort as well as dissuade, praise as well as blame, accuse as well as defend, and these are the sorts of beliefs and premises useful in relation to the means of persuasion belonging to these; for enthymemes special to (one might almost say) each kind of speech are concerned with these and composed of these.

But since rhetoric is for the sake of judgment (for people judge deliberations and a trial is a judgment), it is necessary [for the speaker] to look not only to the argument, that it be demonstrative and persuasive, but also to establish both himself and the judge as being of a certain sort; for it makes a great difference with a view to persuading—especially in deliberative speeches, but next in judicial ones—both that the speaker appear to be of a certain quality and that his listeners take him to be disposed in a certain way toward them, and if, in addition, they too will be disposed

in a certain way. For the speaker to appear to be of a certain quality is more useful in deliberative speeches, and for the listener to be disposed in a certain way in judicial speeches;[122] for things do not appear the same to those who love and those who hate, nor to those who are angry and those who are mild-mannered, but either altogether distinct or distinct in degree. To the one who loves, the person about whom he makes his judgment seems not to do injustice or to do little injustice, but to the one who hates, it is the contrary; to one having an appetite and being expectant, if something in the future is pleasant, it appears that it will both come about and be good, but to the one who feels none and is disgusted, the contrary.

The causes due to which speakers themselves are persuasive are three; for that is how many things there are, outside demonstrations, due to which we trust. And these are practical wisdom, virtue, and goodwill; for speakers are deceptive in what they say or advise due to all of these or due to one of them; for either it is due to lack of practical wisdom that they do not form beliefs correctly; or, though forming beliefs correctly, it is due to depravity that they do not say what seems to be so to them; or they are practically wise and decent people, but not people of goodwill, so that it is possible for them not to give the best advice though they know it; and beyond these there is none. It is necessary, therefore, for a person who seems to have all these to be convincing to his listeners. The basis on which we might appear to be practically wise and excellent people must be grasped from our discussions of the virtues;[123] for it is on the basis of the same things that a person would establish both another person and himself as being of a certain sort. About goodwill and friendliness, on the other hand, we must speak in our discussion of the feelings.[124]

The feelings are those things due to which people, by undergoing a change, differ in their judgments, and that entail pain and pleasure—for example, anger, pity, fear, and other such things, and their contraries. And with respect to each a division into three must be made. I mean, for example, in speaking of anger, by being disposed in which way people are angry, at whom they are usually angry, and for which sort of things; for if we possessed one or two of these, but not all, it would be impossible to produce anger in another person. And similarly in the case of the others. Just as we have given a catalog of premises in the case of the things discussed earlier,[125] then, let us do so about these too, and let us divide them in the way mentioned.

2.2
Anger

Let anger be desire, involving pain, for apparent revenge, because of apparent contempt on the part of someone unfitted to treat the person himself, or one of those

122. Retaining τὸ μὲν . . . δίκας.
123. 1.9.
124. Friendliness is discussed in 2.4; goodwill is not further discussed.
125. 1.3–15.

close to him, with contempt. If, then, this is what anger is, the angry person must always be angry at some particular individual (for example, at Cleon not at the human kind), because the individual has done or is going to do something to him or one of those close to him, and all anger must be followed along with some sort of **1378^{b}1** pleasure, the one from the hope of being revenged; for it is pleasant to think that he will get what he aims at, and no one aims at things that are apparently impossible for him to attain, and the angry person aims at what it possible for him to attain.[126] That is why it has been well said of spirit that:

> Far sweeter than dripping honey
> It grows in the hearts of men.[127]

For a sort of pleasure actually follows along because of this, and also because angry people spend their time in taking revenge through thinking, and so the appearance that occurs at that time produces pleasure, as in the case of dreams.

Since contempt is an activation of belief concerned with what appears to be worth nothing (for we think that both good things and bad ones are worth serious attention, as is what leads to them, while whatever amounts to little or nothing we suppose to be worthy of none), there are three forms of contempt: despising, spite, and wanton aggression; for the one who despises is contemptuous; for the things people despise are the ones they think are worth nothing, and the ones they think are worth nothing they have contempt for.

And the one who is spiteful appears to show contempt; for spite is an impediment to the wishes [of the other], not in order to get something for himself, but in order that the other not get it. Since, then, he does it not to get something for himself, he is showing contempt; for it is clear that he does not suppose that the other will harm him (for then he would be afraid and would not show contempt), nor that the other might benefit him in anything worth mentioning (for then he would be taking care so as to be his friend).

And the wantonly aggressive person also shows contempt; for wanton aggression consists in doing or saying things that involve shame for the one who suffers them, not in order that something or other [beneficial] may come about for the agent himself, or because something [bad] has happened to him, but in order to take pleasure in it; for those who are doing the same thing back are not committing wanton aggression but revenging themselves. The cause of pleasure to those who commit wanton aggression is that they think that they become more superior themselves by doing evil [to others] (that is why young people and rich ones are prone to wanton aggression; for they think themselves superior when they commit wanton aggression). And dishonor is characteristic of wanton aggression, and one who dishonors treats with contempt; for what is worth nothing receives no honor, whether for good or for bad.

126. Reading ὁ δ᾽ὀργιζόμενος . . . αὐτῷ.
127. Homer, *Iliad* 18.109–110. 1370^{b}11–12 quotes in part.

That is why Achilles, when angered, says, "He has dishonored me; for he has taken away my prize and keeps it," and "[treats me] like some dishonored vagabond,"[128] as one angered because of these things.

And people think it fitting that they be highly esteemed by those inferior in birth, in capacity, in virtue, and, in general, in whatever they themselves are largely superior in—for example, in money, the rich man by the poor man; in speaking, one skilled at speaking by one incapable in speaking; ruler by ruled; and one who thinks himself worthy of rule by one worthy of being ruled. That is why it has been said that, "great is the spirit of Zeus-cherished kings," and "yet it may be that even afterwards he has a grudge";[129] for kings are vexed because of their superiority. Further, [a person thinks it fitting that he be highly esteemed] by those he thinks he should be treated well by—that is, the ones he has treated well, is treating well, or wishes or has wished to treat well, either himself or someone else because of himself or someone among those close to him.

It is already evident from these considerations by being disposed in which way people are angry, at whom they are angry, and because of what sorts of things. For they are angry when they are pained; for the one who is pained aims at something. If, then, anyone in any way directly obstructs, for example, a thirsty man from drinking, or if he does not do so directly, appears to be doing the same thing,[130] or if he acts against him or does not assist him in acting, or annoys him in some other respect when he is so disposed[, as to aim at something], at all such people he is angry. That is why those who are ill, poor, at war,[131] in love, thirsty—in general, those with an appetite and not successful in satisfying it—are irascible, that is, easily provoked to anger, especially toward those who show contempt for their present condition.[132] For example, the one who is ill is easily provoked because of things related to his illness, the poor one because of things related to his poverty, the one at war because of things related to the war, the one in love because of things related to his love, and likewise too in the other cases; for each is predisposed by his present feeling to his particular anger.

Further, [a person is angry] if he happened to be expecting the contrary; for what is to a high degree contrary to belief pains more, just as what is to a high degree contrary to belief delights more, if what is wished for comes about. And that is why it is evident from these considerations what opportune moments, times, dispositions, and stages of life are the sort in which people are more easily moved to anger, and in what conditions, and when, and when they are more in these, they are more easily moved.

People so disposed, then, are easily moved to anger, and they are angry at those who ridicule, scoff, or jibe[133] at them; for they commit wanton aggression. And at

128. Homer, *Iliad* 1.356, 9.648.
129. Homer, *Iliad* 2.196, 1.82.
130. Reading ὁμοίως ταὐτὸ φαίνεται ποιεῖν.
131. Reading πολεμοῦντες.
132. Reading διὸ . . . ὀλιγωροῦντας.
133. *NE* 4.8.

those who do such actions as are signs of wanton aggression—and these must be such as are neither payback for something nor beneficial to those who do them; for actions of this sort are immediately taken to be due to wanton aggression. And at those who speak badly about, or despise, things they themselves take most seriously—for example, those who take pride in philosophy, if someone does this about philosophy, or those who take pride in their looks, if someone does it about their looks, and likewise in the other cases. And they do so much more if they suspect that they themselves do not really possess [the things they take pride in], either at all or in any strong sense, or do not seem to; for when they very confidently think themselves to be superior in the things that are being jibed at, they give it no thought. **1379**^{b}**1**

Also, [people are angry] at friends more than at those who are not friends; for they think it more fitting to be treated well by them than not. And at those who are in the habit of honoring or caring about them, if, contrariwise, they do not care about them in the same way; for in fact they think they are being despised by them too; for otherwise they would treat them in the same way [as before]. And at those who do not treat them well in return, and those who do not give equally in return; and at those who do things contrary to [their wishes], if they are inferiors; for all such people appear to despise them: the latter as if looking down on them as if they were inferiors; the former as if they had been treated well by inferiors. And more so at those who are of no account, if they show contempt in some way; for anger characteristic of contempt is assumed to be at those unfitted to show it, and it is fitting for inferiors not to show contempt.

Also [people are angry] at friends if these do not speak well of them or treat them well, and yet more so if they do the contrary, and if they are imperceptive of those in need, as in the case of Plexippus in Antiphon's *Meleager*;[134] for not to be perceptive is a sign of contempt; for what we care about does not escape our notice. And at those who rejoice or are fully in good mood during their strokes of bad luck; for it is a sign of being either an enemy or one showing contempt. And at those who do not care if they pain them; that is why people are angry at those who bring bad news. And at those who listen to bad things about them or contemplate base things of theirs; for these are like contemptuous people or enemies; for friends feel pain jointly, and all are pained when they contemplate base things that are properly their own.

Further, [people are angry] at those who show contempt for them in front of five sorts of people: those they take to be their rivals, those they admire, those they wish to be admired by, those in front of whom they feel shame, or those who are ashamed in front of them. If someone shows contempt for them in front of these, they are yet more angry. And at those who show contempt for things of the sort it would be shameful for them not to help—for example, parents, children, wives, and

134. Plexippus, the uncle of Meleager, was angry at the latter for insensitively giving his prize (the skin of the Calydonian boar) to Atalanta, with whom he was in love. The play, which 1399^{b}26–27 also quotes, is not extant.

those they rule. And at those who do not return a favor; for the contempt shown is beyond what is fitting. And at those who are self-deprecating in relation to what they take seriously; for then self-deprecation is [a sign of] despising. And at those who treat others well, if they do not also treat them that way; for then this too is [a sign of] despising: not thinking them worthy of what they do for all and sundry. And forgetfulness is also productive of anger—for example, forgetfulness of their names, although it has to do with such a small matter; for even forgetfulness seems to be a sign of contempt; for forgetfulness comes about through indifference, and indifference is a sort of contempt.

Those, then, at whom people are angry, by being disposed in which way they are angry, and because of what sorts of things, have at one and the same time been stated. And it is clear that a speaker might need to establish by his speech the sort of state in his listeners as will dispose them to anger, and to establish his opponents as liable for those things about which one gets angry, and as being themselves the sort of people one gets angry at.

2.3
Mild-Manneredness

Since becoming angry is the contrary of becoming mild-mannered, and anger to mild-manneredness, we must grasp by being disposed in which way people are mild-mannered, to whom they are mild-mannered, and because of what sorts of things they become mild-mannered. Let becoming mild-mannered, then, be a settling down and coming to rest of anger. If, then, people are angry at those who show contempt, and showing contempt is something voluntary, it is evident that they are mild-mannered toward those who do none of these things, or do them involuntarily, or are [only] apparently of this sort. And toward those wishing to do the contrary of what they have done. And toward all who are such towards themselves too; for no one seems to show contempt for himself.

Also, toward those who admit and regret; for taking as just recompense their being pained at what they have done, people cease to be angry. A sign of this is found in the punishment of slaves; for we punish more severely those who dispute and deny, while we cease our spirited response toward those who agree that they are justly punished. And the cause of this is that to deny evident facts is shamelessness, and shamelessness shows contempt and [in particular] despising—at any rate, we feel no shame before those we deeply despise.

Also, toward those who humble themselves before them and do not dispute with them; for they appear to agree that they are inferior, inferiors are afraid, and no one who is afraid shows contempt—indeed, the fact that anger ceases toward those who humble themselves is something that even dogs make clear by not biting those who are sitting.[135] And toward those who are serious toward serious people; for it seems

135. And so seem to pose no threat.

to them that they are being taken seriously rather than being despised. And toward those who have shown them greater favor. And toward those who are begging a favor and entreating them [not to be angry]; for they are humbler.

Also, toward those who are not being wantonly aggressive, satirizing, or showing contempt toward anyone, or not against good people, or people like themselves; {and in general, the things that inspire mild-manneredness should be looked for from their contraries.}[136] Also, they do not get angry at those whom they fear or feel shame in front of, and are not angry as long as they are thus disposed; for it is impossible to be afraid and angry at the same time. And people are not angry, or are less angry, at people who have done things because of anger; for they do not seem to have acted because of contempt; for no one shows contempt while angry; for showing contempt is painless, while anger involves pain. Also, people are mild-mannered toward those who feel shame in front of them. **1380^{b}1**

Also, it is clear that people whose condition goes contrary to being angry are mild-mannered—for example, in the condition of amusement, of laughter, in a holiday mood, in a condition of prosperity, of success, of satisfaction—in general, in a condition of painlessness, of pleasure that does not result from wanton aggression, and of decent hope.

Further, when they have spent time with their anger and are not in the first burst of it; for time causes anger to cease. And vengeance previously taken on one person causes a greater anger against another person to cease. {That is why when someone asked Philocrates on an occasion when the people were angry, "Why do you not defend yourself?" he answered wisely, "Not yet." "But when?" "When I see someone else has been accused";}[137] for people become mild-mannered when they have spent their anger on someone else. This happened in the case of Ergophilus; for though the people were more embittered against him than against Callisthenes, they let him go because they had condemned Callisthenes to death on the previous day.

Also, if they pity [the offenders], especially if these have suffered a greater bad thing than they, when angry, would have done to them; for they think they have, as it were, got their revenge. And if they think that they themselves have done injustice and suffered justly; for anger does not arise at what is just;[138] for they no longer think that they are suffering beyond what is fitting, and this, we saw,[139] is what anger requires. That is why one should inflict a preliminary punishment by words; for even slaves are less vexed when so punished.

Also, if the offended think that the ones punished will not perceive that the punishment suffered is due to [the offended] themselves and is in return for what they themselves have suffered; for anger is directed at a particular individual,[140] as is

136. Probably out of place.
137. Probably out of place.
138. Reading οὐ γίγνεται ἡ ὀργὴ πρὸς τὸ δίκαιον.
139. 1378^{a}31–32.
140. Reading ἡ γὰρ ὀργὴ πρὸς τὸν καθ' ἕκαστόν ἐστιν.

clear from the definition.[141] That is why the poet has correctly written, "Say it was Odysseus, sacker of cities,"[142] on the supposition that he has not been revenged if [Polyphemus the Cyclops] has not perceived both by whom and in return for what [he had been blinded]. So people are not angry either at all the others who do not perceive these things, or any further at the dead, on the supposition that they have suffered the ultimate, and do not feel pain or have perception, which is what angry people aim at. That is why the poet, in wishing Achilles to cease his anger at Hector once he was dead, well said, "For it is senseless clay that he outrages in his wrath."[143] It is clear, then, that those who wish to make their listeners mild-mannered should speak from these topics, making, on the one hand, the listeners be of that sort and, on the other, rendering those at whom they are angry as either fearsome, or worthy of being ashamed in front of, or as having shown them favor, or as involuntary agents, or as deeply pained by what they have done.

2.4
Friendliness and Enmity

Let us say whom people love and hate, and because of what, after having defined friendliness and being friendly. Let being friendly, then, be wishing for someone what one thinks to be good things, for his sake not for one's own, and to be productive in action of such things so far as one can. And a friend is one who loves and is loved in return;[144] and people think they are friends when they think they are both this way. These things being presupposed, a friend is necessarily someone who shares in one's pleasure at good things and in one's pains at painful ones, not because of something else, but because of oneself; for all enjoy it when the things they wish for come about, and are pained when the contrary ones do, so that the pains and the pleasures are signs of wish. And friends are the ones, then, to whom the same things are good and bad and who are friends and enemies with the same people;[145] for it is necessary for them to wish for the same things. So the one who also wishes for another the very things he wishes for himself is manifestly a friend to him.

Also, people are friendly to those who have done good things for them, whether for themselves or for those they care about (be these great things, or done eagerly, or at opportune times), and for their sake—or to those they think wish to do good things. And to the friends of their friends, and to those who like the same people they like. And to those who are liked by those who are liked by them; those who have the

141. 1378ᵃ34–35.
142. Homer, *Odyssey* 9.504.
143. Homer, *Iliad* 24.504. The speaker is Apollo, who is appealing to the other gods to allow Hector to be buried.
144. Reading φίλος δ'. . . ἀντιφιλούμενος.
145. Reading καὶ οἱ . . . ἐχθροί.

same enemies they have and hate those they hate; and those who are hated by those who are hated by them; for the same things seem to be good to all these [as seem to be good] to themselves, so that these others wish for the things that are good for themselves, which is precisely the thing, as we saw, that is characteristic of a friend.

Further, [people are friendly] to those who are able and disposed to do good things for others with regard to money and with regard to safety; that is why they honor generous and courageous people. Also, to those who are just. And they suppose that those who do not live off others are just: the ones who are such as to live by their own labor, and, of these, the ones who do so from farming, and, of these, above all the ones who work the land themselves. And to those who are temperate, because they are not unjust. And to those who mind their own business, due to the same consideration.

And [we are also friendly] to those we wish to be friends with, if they appear to wish it; and those who are good in accord with virtue are like this, as are those who have a good reputation, either among all, or among the best people, or among those who are admired by us, or among those who admire us. Further, to those who are pleasant to pass the time with and spend our days with. Such people are those who are calm and not critical of our errors, and neither lovers of victory nor quarrelsome people are like this; for all such people are pugnacious, and pugnacious people manifestly wish for the contrary things. And [we are also friendly] to dexterous people in mocking and standing one's ground [when mocked]; for both strive[146] toward the same thing as their neighbor: to be capable of jibing and of taking a jibe in a gracious way. Also, to those who praise the good qualities that belong to us, and of these, especially the ones that we are afraid may not belong to us. And to those who are refined in appearance, dress, and in their whole way of life. And to those who do not **1381^{b}1** reproach us either for our errors [in their regard] or for their benefactions [to us] (for both lots are inclined to be critical of us).

Also, [people are friendly] to those who are not inclined to remember injuries or store up accusations, but instead are easily appeased; for as they take them to be toward others, so they think they will be toward themselves. And to those who do not speak badly, or even want to know the bad things, either about their neighbors or about themselves, but instead the good ones; for these are the things a good person does. And to those who do not oppose others who are angry or being serious; for such people are pugnacious. And to those who are in some way seriously disposed toward them—for example, who admire them, take them to be excellent people, and find enjoyment in them, and especially those who feel this way about things they especially wish for themselves, or admire, or believe to be excellent, or take pleasure in. And to those who are like themselves and have the same practices, provided they do not become too annoying or get their livelihood from the same thing; for then it becomes a case of potter versus potter. And to those who have an appetite for the

146. Reading ἀμφότεροι.

same things, when it is possible to share these at the same time; otherwise the same thing results as in the previous case.

Also, to those they are so disposed toward that they are not ashamed of what seems to be [bad], provided they do not despise them. And to those they are so disposed toward that they are ashamed of what truly is [bad]. And they are friendly to, or wish to be friends with, those they are rivals of, or those they wish to be emulated by, not envied. And to those together with whom they do good things, unless greater bad ones are going to result for themselves. And to those[147] who are equally friendly to their friends both absent and present, which is why all are friendly to those who are such even toward dead friends. And, in general, those who are intensely friendly to their friends and are not inclined to leave them in the lurch; for among good people they are especially friendly to those who are good at being friendly. Also, those who do not falsify themselves to them; and those who tell them even the bad things about themselves are like this; for it was mentioned that in front of friends we are not ashamed of things that seem [bad]; if, then, someone who is ashamed is not a friend, the one who is not ashamed is like a friend. And those who are not fearsome and in whom we have confidence; for no one is friendly to someone he is afraid of.

The forms of friendship are companionate, intimate, familial, and others of this sort. And things productive of friendship are doing a favor; doing it without being asked to do it; and not advertising it when it has been done; for then it appears to be done for the sake of the friend and not because of something else.

As regards enmity and hating, it is evident that they are to be theoretically grasped from their contraries. And the things productive of enmity are anger, spite, and accusation. Anger arises from things done against oneself, enmity also not from things done against oneself; for if we take someone to be of such-and-such sort, we hate him. And anger is always concerned with particulars, such as Callias or Socrates, while hate is also directed against kinds; for everyone hates the thief and the sycophant. And the former is curable in time, while the latter is not curable. And the former aims at pain [for its object], the latter at evil; for the angry person wishes [his revenge] to be perceived, while to the latter it makes no difference; and painful things are all perceptible, while the greatest evils are the least perceptible ones, [for example,] injustice, foolishness; for the presence of the evil does not at all cause pain. And anger involves pain, while hate does not involve pain; for the angry person is pained, while the one who hates is not. And the angry person may feel pity when many [revengeful] things have happened, while the one who hates never does; for the former wishes the one he is angry at to suffer in turn, while the latter wishes for him not to exist.

It is evident, then, from these considerations that it is possible to demonstrate that people are enemies or friends, to make them so when they are not, to refute those who claim to be friends or enemies, and to draw those who because of anger or enmity are our opponents toward whichever of them one may deliberately choose.

147. Reading τοῖς.

What sorts of things people fear, and whom, and by being disposed in which way [they feel fear] will be evident from what follows.

2.5
Fear and Confidence

Let fear, then, be a sort of pain or disturbance coming from the appearance of a future destructive or painful evil; for people do not fear all evils (for example, that one will become unjust or slow-witted), but rather those that are capable of [causing] great pains or great destructions, and if they appear not far off but close at hand, and so about to happen. For people do not fear what is very far off; for they all know that they will die, but because it is not close at hand, they care nothing about it.

If, then, this is what fear is, necessarily the sorts of things that are fearsome are whichever ones appear to have a great capacity for destroying or causing harms that lead to great pain. That is why even the signs of such things are fearsome; for what is fearsome appears close at hand. In fact, this is what danger is: the approaching of something fearsome. Such signs are enmity, anger on the part of those capable of doing something [fearsome] (for it is clear that they wish to do it, so that they are close to doing it), and injustice having this capacity (for the unjust person is unjust by deliberate choice). Also, virtue outraged by wanton aggression when it has this capacity; for it is clear that when outraged by wanton aggression, it deliberately chooses **1382^{b}1** [to retaliate], always [does so], and now it can. And fear on the part of those capable of doing something [fearsome]; for someone like that is also necessarily in readiness.

Since ordinary people are worse [than they should be], subjugated to profit, and cowardly in times of danger, being in the power of another is for the most part fearsome, so that the accomplices of someone who has done something terrible are fearsome, as likely to inform on him or leave him in the lurch. And those capable of doing injustice are fearsome to those capable of having injustice done to them; for people, for the most part, do injustice when they have the capacity to do so. Also, those who have been treated unjustly, or think they have been treated unjustly; for they are always on the lookout for an opportune moment [to take revenge]. And those who have done injustice, if they are capable [of doing something fearsome], are fearsome, as being anxious about retaliation; for this was assumed to be something fearsome. And those who are competitors for the same things, whenever it is not possible for both to share them at the same time; for people always make an enemy of such competitors.

Also, those who are fearsome to others who are stronger than us [are fearsome]; for those people are capable of harming us more, if they are capable of harming even those who are stronger than us. And (due to the same thing) those feared by others who are stronger than we are. And people who have destroyed those stronger than they are. And people who have attacked those weaker than they are; for those are

either already fearsome, or will be when they have grown stronger. And among those we have treated unjustly, or are either enemies or rivals, it is not the quick-tempered or outspoken ones [who are fearsome], but the mild-mannered, the self-deprecating, and the unscrupulous ones; for in their case it is unclear if they are close [to taking revenge], so that it is never evident that they are far off [from doing so].

All fearsome things that people have committed in error and are not possible to rectify—but are either wholly impossible or not possible for them but are for their opponents—are more fearsome. Also when there are no possibilities of help, or not easy ones.

Simply speaking, the fearsome things are the ones that are pitiable when they happen or are going to happen to others.

These, then, are pretty much (one might almost say) the most important things that are fearsome and that people fear. Let us now speak about how the ones who are afraid are disposed.

If fear involves a certain expectation of undergoing some destructive suffering, then, it is evident that no one is afraid if he is among those who think that they will suffer nothing at all. Nor will people be afraid of things they do not think they will suffer, nor of people at whose hands they do not think they will suffer, nor at times when they do not think so. Necessarily, therefore, people who think they might suffer something are afraid, and are afraid of those at whose hands they think they might do so, and of the things and at the times that they think they might suffer. And people do not think they will suffer when they are, or seem to themselves to be, **1383a1** in the midst of great prosperity; that is why they exhibit wanton aggression, contempt, and rashness (and what makes them such is wealth, strength, many friends, and [great] capacity). Nor are people afraid who consider that they have already suffered every terror and have grown coldly indifferent to the future, like those being flogged to death and already nearly dead; on the contrary, for them to be afraid there must be some hope of being saved from what they are anxious about. A sign of this is that fear makes people inclined to deliberate, and yet no one deliberates about hopeless things.

So whenever it is better that [the listeners] should feel afraid, [the speaker] should make them feel as if they were to suffer (for even others, greater than them, have suffered), and he should prove that there are others like them who are suffering or have suffered at the hands of those from whom they did not think [it possible], and things they did not expect, and at a time they did not think [it possible].

Since it is now evident what fear is, what the fearsome things are, and by being disposed in which way each is afraid, it is also evident on the basis of this what being confident is, what sorts of things people feel confident about, and by being disposed in which way people feel confident; for confidence is the contrary of fear, and what inspires confidence is the contrary of what is fearsome. So [confidence's] hope of things providing safety involves an appearance of them as being close at hand, and of fearsome things as either non-existent or as being far away. What inspires confidence

is the remoteness of what is dreadful and the closeness of what provides safety.[148] [Things that inspire confidence] also include ways of rectifying the situation, or many possibilities of help, or great ones, or both. Or the fact that they have not been treated unjustly or treated others unjustly, that they have no competitors, or that these have no capacity. Or that those having capacity are their friends, or that they have either done them good or received it from them. Or the fact that those whose advantage is the same as theirs are more numerous, or stronger, or both [than those opposed].

People feel confident by being disposed as follows: when they think they have often been successful and not suffered, or have often come into terrible situations and escaped them (for people become free from the feeling [of fear] in two ways: either by not having been put to the test or by having the means to help, just as in dangers at sea those without experience of a storm are confident about what will happen, as too are those who have the means to help due to their experience); also, when something is not fearsome to people like themselves, their inferiors, or those whose superiors they think themselves to be; and they think themselves superior to those they have defeated, either these themselves, their superiors, or their equals; also, if they think they have more or better resources, superiority in which makes them fearsome—these are a quantity of money, of supporters, of friends, of lands, and of armaments for war, either all of them or the most important ones.

Also, if they have done no injustice to anyone, or not to many, or not to those in front of whom they have anything to fear, {and, in general, if their relations with the gods are good, both as told in other ways and from signs and oracles}[149] (for anger is something that inspires confidence, not to do injustice but to suffer injustice is productive of anger, and the divine is supposed to help those who have suffered injustice). And people feel confident when, putting their hands to something, they think they are not likely [here and now] to suffer, will not suffer in the future, or will be successful.[150]

About both fearsome things and confidence-inspiring ones, then, let this much be said.

2.6
Shame and Shamelessness

What sorts of things people are ashamed of or are shameless about, in front of whom, and how—by being disposed in the relevant way [they feel shame]—is clear from the following. Let shame be a sort of pain or disturbance concerned with the evils—whether present, past, or future—that appear to bring a person into disrepute, and shamelessness a sort of contempt and lack of feeling concerning these same things.

148. Reading τὰ σωτήρια.
149. Probably out of place.
150. Reading μηδὲ πείσεσθαι.

If, then, what has been so defined is shame, necessarily people are ashamed of such evils as seem shameful either for themselves or for those they care about. And works due to vice are like this. For example: Throwing away a shield or fleeing; for these are due to cowardice. Refusing to return a deposit; for this is due to injustice. Having sexual relations with those one should not, or where one should not, or when one should not; for these are due to intemperance. Making a profit from petty or shameful things or from incapable people, such as the poor or the dead—hence the proverb, "He would even rob a corpse"; for this is due to shameful profiteering and acquisitiveness. Not helping out with money when one can, or helping less. Being helped by those with fewer resources. Seeking a loan from someone when he seems likely to ask for one, and asking for one when he seems likely to ask to have one returned, and asking to have one returned when he seems likely to ask for one, and praising in order to seem to be asking, and though one has failed in the effort, to ask nonetheless; for all these are signs of acquisitiveness. Praising those present (a sign of flattery).[151] Overpraising good things and minimizing bad ones, and feeling over-pained at the pain of someone present, and all other such things; for these are signs of flattery. Not enduring exertions that older people endure, or those who are effeminate, of higher rank, or, in general, more incapable [of enduring them]; for all are signs of softness. Accepting good deeds from another, and doing so often, or reproaching someone who did something good [for you]; for all these are signs of smallness of soul and humbleness. Talking about oneself all the time, and making pronouncements, and claiming other people's achievements as one's own; for these are signs of boastfulness. Likewise too for the works, signs, and the like that are due to the other vices of character; for these are shameful and productive of shame.

In addition to these, it is shameful not to share in the noble things in which all—or all those like oneself, or most of them—share. By "those like oneself" I mean those of the same nation, fellow citizens, those at the same stage of life, those of the same birth, and, in general, one's equals; for it is already shameful not to share, for example, in education to the same extent, and similarly for other things. And all these are more shameful if they appear to be due to oneself; for in this case they already seem more due to vice: whenever one is oneself the cause of one's past, present, or future condition.

People feel shame when they suffer, have suffered, or are going to suffer such things as lead to dishonor and reproaches—such things are those in regard to the services of the body or those subserving shameful works,[152] of which being treated with wanton aggression is one, and while those in regard to intemperance may be either voluntary or involuntary, those in regard to force are involuntary; for enduring them and not defending oneself against them is due to a lack of manliness and cowardice.

151. Reading τὸ δ᾽ἐπαινεῖν παρόντας καλοκείας.
152. Reading ταῦτα δ᾽. . . αἰσχρῶν.

These, then, and the like are the things people are ashamed of. And since shame is an appearance concerning disrepute, and this for its own sake and not for the sake of its consequences, and since no one cares about reputation [by itself], but rather does so because of those who have the pertinent opinion, necessarily a person feels shame in front of those he takes account of. And he takes account of those who admire him, those whom he admires, those whom he wishes to be admired by, those whose rivals he is, and those whose opinion he does not despise.

People wish to be admired by those and to admire those who possess any good from among those that bring honor, or from whom they desperately need something that those people control—for example, their lovers. And they are rivals of those who are like them, and they give thought to practically wise people as tellers of the truth, and their elders and well-educated people are like this.

And they feel more shame at things done in front of [everyone's] eyes and in the open; hence too the proverb, "Shame is in the eyes." This is why people feel more shame in front of those who will always be with them and those who notice what they do, because in both cases they are in front of their eyes. And in front of those **1384b1** not liable to the same charges; for it is clear that the contrary things seem acceptable to them. {And in front of those not inclined to be sympathetically considerate to those who appear to have erred;}[153] for what one does oneself, it is said, is what one is not indignant at one's neighbor for doing, so it is clear that what one does not do oneself one is indignant at him for doing. And in front of those inclined to gossip to many people (for there is no difference between its not seeming so to them and their not gossiping about it); and those inclined to gossip are those who have been treated unjustly, because they keep on the lookout, and those who speak badly of others (for if indeed they do so about those who have committed no error, they will do so still more about those who have committed an error). And in front of those who spend their time on their neighbors' errors—for example, satirists and writers of comedies; for these are, in a way, people who speak badly of others and are, in a way, gossips. And before those in front of whom they have never failed; for they are in the position of people admired. That is also why they feel shame before those asking for a favor for the first time, as not yet being disreputable in front of these—and people who recently wished to be their friends are like this (for they have seen their best sides, which is why Euripides' reply to the Syracusans is apropos[154])—and among old acquaintances who know nothing [against them].

And people are ashamed not only of the shameful things that have been mentioned, but also of all the signs of shamefulness—for example, people are ashamed not only of their engaging in sexual intercourse but also of the signs of it, and not

153. Probably out of place.

154. A medieval scholiast tells us that Euripides (the tragic poet) was sent to negotiate peace with the Syracusans and, finding them unwilling, said: "Men of Syracuse, even if because of nothing else, then at least because we are just now [for the first time] in need of you, you should be ashamed to reject us, your admirers."

only of doing shameful things, but also of talking about them. Similarly, people are not only ashamed before those who have been mentioned, but also before those who will reveal things to the former—for example, their servants and friends. But, in general, they are not ashamed before those whose opinion in respect of their telling the truth they despise (for no one feels shame before small children and beasts), nor of the same things before acquaintances and unknown people, but before acquaintances they are ashamed of what seems shameful in relation to truth, and before those from far away they are ashamed of what seems shameful in relation to custom.

People would feel ashamed if they were disposed as follows: first, if there were certain people who were related to them as are those in front of whom we said they feel shame. And these, as we saw,[155] are the ones who are admired by them, who admire them, by whom they wish to be admired, or from whom they want something needed that they will not get if they are disreputable. And [second] if these are either seeing what they are doing (as Cydias said publicly about the allotment of land in Samos;[156] for he thought that the Athenians should imagine all the Greeks to be standing around them in a circle, as if they were seeing how they might vote and not merely hearing about it), or if people like this are in the neighborhood, or are going to perceive what they are doing. That is also why people, when they suffer bad luck, do not wish to be seen by those who were once feeling jealous of them; for those who feel jealous are admirers. And whenever they have works or things that will bring shame on them, whether their own works or things, those of their ancestors, or certain others with whom they have a sort of close kinship. And, in general, they feel shame before those on whose account they themselves feel shame—these are the ones mentioned and those who refer themselves to them, either those whose teachers or advisors they have been, or if there are others like themselves whose rivals they are; for they are ashamed both to do and not to do many things because of such people. And if they are going to be seen by and go about in public with those who share in the knowledge of [their shameful acts], they are more prone to shame. Hence too what Antiphon the poet said, when about to be flogged to death by order of Dionysius, on seeing that those who were about to die with him covered their faces as they passed through the gate: "Why do you cover your faces?" he said. "Or is it in case some of these people will see you tomorrow?"

These, then, are the things that concern shame; it is clear that from their contraries we will be well equipped with things concerning shamelessness.

155. 1384a22–32.

156. Samos was captured by the Athenians in 356 BC and the reference is probably to a proposed allocation of its land to Athenian citizens.

2.7
Gratitude and Ingratitude

Those toward whom people feel grateful, and on account of which things, and how—by being disposed in the relevant way [they feel it], will be clear after having defined a favor. Let a favor, then, in the sense in which the person who has received it is said to feel grateful, be a service provided to one in need, not in return for anything, nor in order that the provider get something, but in order that the recipient get something. It would be a great one if the person is in desperate need, in need of great and difficult-to-get things, or at times of the correlative sorts, or if the provider is the only one, the first one, or the one who most of all provides it.

Needs are desires and, among desires, especially the ones that involve pain at what is not attained; appetites (for example, love) are such things. And those desires felt in sufferings of the body and in times of danger; for in fact the one who is in danger has an appetite for something and so does the one who is in pain. That is why those who stand by someone in poverty or in exile, even if the services they provide are small, because of the greatness of the need and the opportune time of them, have shown favor—for example, the one who gave the mat in the Lyceum.[157] Necessarily, then, favor especially consists in providing service in these sorts of cases[158] or, if not, in cases of equal or greater need.

So, since it is evident to whom, on account of which things, and by being disposed in which way people feel grateful, it is clear that it is from these that [speakers] should produce feelings of gratitude, proving that some people either are or have been in the relevant sort of pain or need and that others have provided some such service in some such time of need or are providing it.

It is also evident on what basis it is possible to exclude feelings of gratitude and produce feelings of ingratitude; for it might be shown that either the people were providing or had provided a service for their own sake (and this, as we saw, is not a favor), or that it happened by luck, or they were compelled, or that they were returning a favor and not doing one, whether knowingly or not knowingly; for in both cases there would be a return, so that not even in this respect would it be a favor. And it should be investigated in relation to all the categories; for a favor is a favor either because it is this particular thing, or because of its quantity, quality, time, or place. And it is a sign [of there being no favor] if a small service is not provided or if the same, equal, or greater services are provided to enemies; for it is clear that in neither case are these for our sake. Or if someone has provided a worthless service and knows it; for no one agrees to having a need for worthless things.

157. Nothing is known about this.
158. Reading εἰς τοιαῦτα.

About feeling gratitude and feeling ingratitude, then, let this much be said. Let us now say what sorts of things are pitiable, whom people pity, and by being disposed in which way they feel it.

2.8
Pity

Let pity, then, be a sort of pain at an apparently destructive or painful bad thing happening to someone who does not deserve it, and one that a person might expect himself too or one of his own to suffer, and this when it appears close at hand; for it is clear that the person who is going to feel pity must actually be such as to think that he, or one of his own, might suffer some such bad thing as is mentioned in the definition, or one like it or much the same as it. That is why neither those who are totally ruined feel pity (for they think there is nothing for them yet to suffer; for they have suffered [everything]) nor those who think themselves to be extremely happy—they instead are wantonly aggressive; for if they think that all goods are actually theirs, it is clear that they think it not possible for them to suffer any evil; for in fact this is one of the goods.

The sort of people who think they might suffer [something bad] are those who have already suffered and escaped, older people (because of both their practical wisdom and their experience), weak ones, those who are rather more cowardly, and those who are well educated; for they rationally calculate well. And those who have parents, children, or wives; for these belong to them and are able to suffer the things mentioned. And those who are neither in a courageous state of feeling, such as anger or confidence (for these feelings do not rationally calculate about future things), nor in a wantonly aggressive condition (for these people too do not rationally calculate about suffering anything), nor, conversely, feeling intense fear (for those who are driven out of their minds with fear do not feel pity, due to being taken up with their own suffering). Instead, it is [only] those who are intermediate between these who feel pity. As they do if they think that certain people are among the decent ones (for the one who thinks that no one is decent will think that all are worthy of something bad). And in general, then, someone feels pity when he is so disposed that he remembers things like this happening to himself or to his own, or expects them to happen to himself or to his own.

By being disposed in which way people feel pity, then, has now been stated; and the things they pity are clear from the definition; for whichever painful or distressing things are destructive[159] are all pitiable, and whichever ones are ruinous, and whichever evils having magnitude of which luck is the cause. The distressing and destructive ones are the various sorts of death, assaults on the body, ill-treatment, old age, diseases, and lack of nourishment. The evils that luck is the cause of are friendlessness, fewness of friends (which is why it is a pity to be torn away from

159. Reading φθαρτικά.

friends and the people one is accustomed to), ugliness, weakness, disablement. And it is pitiable for something bad to come about from what something good should have come. And for this to happen often. And for something good to come about after a person has suffered, as when the gifts from the king were sent to Diopeithes after he had died. And it is pitiable either for nothing good whatever to have come about [for someone], or for there to be no indulgence in it. These, then, and things like them are the ones people pity.

[As for the people they pity,] they pity those they know, provided they are not too closely related to them (if they are, they feel for them as they do about their own future sufferings). That is why Amasis,[160] so it is said, did not weep when his son was led to execution, but did weep when he saw his friend begging; for the latter was pitiable, the former dreadful; for the dreadful is distinct from the pitiable and tends to drive out pity, and is often useful to the opponent; for people no longer pity when something dreadful is close to themselves. And people pity those who are like themselves in stage of life, character, state, position, or birth; for in all these cases it appears more likely that what happens to them may happen to the person himself as well; for, in general, one should suppose here too that the things people fear for themselves are the ones they pity when they are happening to others. And since sufferings are pitiable when they appear close at hand, and since people do not feel pity either at all, or not to the same degree, at things ten thousand years in the past or future (for they neither expect nor remember them), necessarily those who contribute to the effect by their gestures, voice, dress, and, in general, by their dramatic manner are more pitiable (for they make the evil appear close at hand by setting it before our eyes either as something about to happen or as something that has happened). And things that have just happened or are going to happen soon are more pitiable. That is why signs and actions[161] are pitiable too—for example, the clothes of those who have suffered and any things of that sort, and the words and any things of that sort of those who are in the midst of suffering, for example, of those on the very point of death—are pitiable, and especially so when those involved in such situations are excellent people; for all such things, through appearing close at hand, produce more pity, both because the suffering is of someone who does not deserve it and because it is appearing before our eyes.

2.9
Indignation

But most opposed to feeling pity is what people call "being indignant." For being pained at undeservedly doing badly is, in a way, opposed to, and due to the same character as, being pained at undeservedly doing well. And both feelings belong to a

160. Herodotus 3.14 tells this story about Psammetichus III (king of Egypt c. 525 BC), son of Amasis.

161. Reading καὶ τὰς πράξεις.

good character; for one should grieve together with and feel pity for those who undeservedly do badly, but feel indignation at those who undeservedly do well; for what happens contrary to what is deserved is unjust, which is why we ascribe indignation even to the gods.

It might seem that envy is also opposed to feeling pity in the same way, as being of the same kind—even the same thing—as indignation; but it is a distinct thing; for though envy too is a disturbing pain and is directed at doing well, it is not at someone undeserving of it, but at an equal and a similar. And what must be present alike in each and every instance [of envy and indignation] is that [the painful disturbance] not be because something distinct will accrue to the person himself, but because of his neighbor himself; for it will be neither envy nor indignation but rather fear if the pain and the disturbance are present because something base will happen to the person himself because of the other's doing well.

And it is evident that contrary feelings will follow along with these; for the one who is pained at people undeservedly doing badly will be pleased or not pained by their doing badly in the contrary way—for example, no good person would be pained at parricides and bloodthirsty murderers when they are punished; for one should rejoice in such cases, as in the case of those who deservedly do well; for both are just things that make a decent person rejoice; for he must expect that the very things that have happened to someone like him will happen to him too. And all these belong to the same character, and the contrary ones to the contrary one; for the same person will be spiteful and envious; for when someone is pained at the acquisition or possession of something, he necessarily rejoices at its privation or destruction. That is why all these tend to prevent pity, though they differ due to the causes mentioned, so that they are all similarly useful in making people not pity someone.

First, then, let us speak about being indignant, whom people are indignant at, on account of which things, and by being disposed in which way they feel it, and after this about the other feelings. And it is evident from what has been said; for if being indignant is being pained at what appears to be undeservedly doing well, it is clear, first, that it is not possible to be indignant at all good things; for if someone is just or courageous or if he will acquire virtue, no one will be indignant at these things (for neither is there pity for the contraries of these), but people are indignant at wealth, capacity, and the like—at, simply speaking, all those things that good people—and those who possess the things that are good by nature (for example, good breeding, noble beauty, and the like)—deserve.

And since what is long established appears to be something close to what is by nature, if two parties have the same good, people are necessarily more indignant at the one who has recently acquired it and is doing well because of it; for the nouveaux riches cause more pain than those whose wealth is long established or through the family. And similarly the ones who hold office, have capacity, have

many friends, have good children, or anything like that. And if some other good comes to them because of these things, it is the same way; for in fact in this case too the nouveaux riches cause more pain than do those whose wealth is long established when they hold office because of their wealth. And similarly in the other cases. And the cause of this is that what the latter have seems to be their own, while what the former have does not; for what appears always to be that way seems real and true, with the result that the others seem not to have what is their own. And since each good thing is not deserved by any random person, but rather there is a sort of proportion and fit involved (for example, noble weapons are fitting not for the just person but for the courageous one, and distinguished marriages are fitting not for the nouveaux riches but for the well-bred), it follows that if a good person gets what is not fitting, it is a cause of indignation. Also, for an inferior person to dispute with a superior one, especially when they are involved in one and the same matter—hence too this has been said:

> But he avoided doing battle with Ajax, son of Telemon,
> For Zeus was indignant with him when he fought with a better man.[162]

But if it is not the same, even if it is in any way whatever that an inferior person disputes with a superior one—for example, if a musician does so with a just person (for justice is better than music)—it is a cause of indignation. **1387^{b}1**

Whom people are indignant at, then, and why, is clear from this; for they are the ones mentioned and those like them. And people tend to be indignant, [first,] if they deserve great goods and have acquired them; for it is not just that those not like them should have been thought worthy of goods like theirs. Second, if they happen to be good and excellent; for they judge well and hate unjust things. Also, if they are ambitious and desirous of certain things, and especially if they are ambitious for things that others, who happen to be unworthy of them, have obtained. And, in general, those who think themselves worthy of things of which they think others unworthy tend to be indignant at the latter and about these things. That is why the slavish, the base, and the unambitious do not tend to be indignant; for there is nothing they think themselves to be worthy of.

It is evident from these considerations what sort of people those are at whose being unfortunate, doing badly, and not succeeding one should rejoice or not be pained; for these opposites are clear from what has been said. So if the speech makes the judges be of this sort, and proves that those who think they deserve to be pitied, and to be pitied for certain things, do not deserve it, or deserve not to get it, it will be impossible to pity them.

162. The first line is Homer, *Iliad* 11.542; the second is not in our text.

2.10
Envy

And it is also clear on account of which things people envy, whom they do, and by being disposed in which way, if indeed envy is a sort of pain at apparent doing well in terms of the goods mentioned, on the part of those like themselves, not in order that something accrue to the person himself, but because of those [possessing it]; for the sort of people who feel envy are those who have equals, or appear to themselves to have them (and by "equals" I mean equal in terms of birth, familial relationship, stage of life, state, reputation, possessions). Also, those who fall just short of having everything. That is why those who do great things and those who are successful are envious; for they think that everyone is taking what is [rightfully] theirs. Also, those who are exceptionally honored for something, and especially for theoretical wisdom or happiness. And the ambitious are more envious than the unambitious. And the seemingly wise; for they are ambitious for wisdom. And, in general, those who are lovers of reputation concerning something are envious concerning it. Also, the small-souled; for all things seem great to them.

The good things on account of which people are envious have already been stated; for the works and possessions that make people lovers of reputation and for which they are ambitious and desire a reputation, as well as whatever things are matters of good luck, are all pretty much objects of envy, and especially the ones that they themselves desire or think they should have, or things whose possession makes them slightly superior or slightly inferior. And whom people envy is also evident; for these have just now been stated; for they envy those close to them in time, space, stage of life, and reputation—hence it has been said, "For what is the same in kind also knows how to envy."[163] And people envy those they rival; for they rival those mentioned, while no one rivals people who lived ten thousand years ago, those of the future, or those who are dead,[164] or those who live at the Pillars of Heracles, or those that they or others think are far inferior or far superior. And in the same way those concerned with the same things. And since people are ambitious for success in relation to their competitors, their rivals in love, and, in general, those who are pursuing the same things, they are necessarily most envious of these—which is why it is said [that they are like] "potter versus potter."[165] And they are envious of those whose past acquisitions or present successes are a reproach to them, and those are, again, the ones that are close at hand and like them; for it is clear that it is because of themselves that they did not attain the [relevant] good, so that this failure, being painful, produces envy. Also, [they are envious] of those who have or have acquired what is fittingly theirs or which they once possessed, which is why the older envy the younger. And those who

163. Aeschylus, Fr. 305 Nauck. Reading ὅθεν εἴρηται . . . ἐπίσταται.
164. Reading ἢ τεθνεῶτας.
165. Hesiod, *Works and Days* 25. Also 1381b16–17.

have spent much money envy those who have spent little on the same thing. And those who acquired something with difficulty or did not acquire it at all envy those who got it quickly.

And it also clear the things on account of which and what people envious ones rejoice at and by being disposed in which way; for the way by being disposed in which people are pained is also the way by being disposed in which they are pleased at the contrary things. So if [the audience] has been made to be disposed in this way, and if people of the sort described have thought themselves deserving to be pitied or to attain some good, it is clear that they will not attain pity from those with the controlling vote.

2.11
Jealousy

By being disposed in which way people feel jealous and for what sorts of things, and toward what sorts of people is clear from the following; for if jealousy is a sort of pain at the apparent presence, in the case of others who are by nature like the person himself, of good things that are honored and possible for someone to acquire, not due to the fact that another has them but rather due to the fact that he himself does not have them too (and that is why jealousy is a decent thing characteristic of decent people, while envy is a base one and characteristic of base ones; for the decent person, because of jealousy, is setting himself up to attain the good things, while the base one, because of envy, is setting his neighbor up not to have them), necessarily, then, those people are jealous who think themselves worthy of good things they do not have; {for no one thinks himself worthy of things that appear to be impossible.}[166] That is why young people and great-souled ones are like this. Also, those who possess such goods as are worthy of honorable men, and these are wealth, many friends, offices, and the like; for on the supposition that it is fitting for them to be good people, they are jealous of such goods, because such goods are fitting[167] for those who are good. And those whom others think worthy of such goods. And they are inclined to be jealous of anything for which their ancestors, relatives, households, nation, or city are honored; for they think that such things are properly theirs and that they are worthy of them.

But if the objects of jealousy are the honored goods, the virtues are necessarily such, and whatever is beneficial or beneficent to others; for people honor those who are benefactors as well as those who are good. Also, whatever goods are for the indulgence of neighbors—for example, wealth and noble beauty rather than health.

Whom people are jealous of is also evident; for the people we are jealous of are the ones who have acquired these things and others of the same sort (and these are

166. Probably out of place.
167. Reading ὅτι προσήκει.

the things mentioned, such as courage, theoretical wisdom, and office—for officials have the capacity to do good things for many people): generals, orators, and all who possess such capacities. And those whom many wish to be like, or many of their acquaintances, or many of their friends, or those whom many admire, or whom they themselves admire. Also, those whose praises and encomia are sung by poets or professional speechwriters.

And people despise the contraries of these; for despising is the contrary of jealousy, and to despise someone is the contrary of being jealous of him. And those who are so disposed that they are jealous of others or others are jealous of them are inclined to despise those who have the bad contraries of the goods that people are jealous of, and to do so because of these. That is why they often despise those who are fortunate, whenever luck comes to them but without their having the good things that are honored.

The things by which the feelings may be aroused or dissolved, and from which the means of persuasion concerning them come about, have now been stated.

2.12
The Character of Young People

Next let us discuss people's characters, that is, of what sorts people are with regard to their feelings and states, as well as with regard to their stages of life and luck. By "feelings" I mean anger, appetite, and the like, about which we spoke previously, and by "states" I mean virtues and vices, which have also been spoken about previously,[168] as well as the sorts of things that each deliberately chooses, and the sorts that each is prone to do in action. The stages of life are youth, prime, and old age. By "luck" I **1389a1** mean good breeding, wealth, capacities, and their contraries, and, in general, good luck and bad luck.

The young, with regard to their character, are inclined to be appetitive and such as to do whatever they have an appetite for. And of the appetites of the body they are especially inclined to follow the one relating to sexual pleasures, and they lack self-control concerning it. And they are changeable and fickle in their appetites, and though their appetites are intense they are quickly over; for their wishes are sharp but not strong, like the thirst and hunger of the sick. And they are inclined to be spirited and quick-tempered and apt to follow their anger. And they are unable to resist their spirit; for because of their love of honor they cannot bear to be treated with contempt, but become vexed if they think they are being done an injustice. And though they are lovers of honor, they are lovers of victory more; for youth has an appetite for superiority, and victory is a sort of superiority. And they are both of these more than they are lovers of money. In fact they, least of all, are lovers of money

168. 2.2–11.

because they have not yet experienced need, as the pithy remark of Pittacus about Amphiaraus puts it.

And they are not cynical but foolish, because of not yet having seen much wickedness. And they are trusting, because of not yet having been much deceived. And they are hopeful; for like those drinking wine the young are warmed through and through by their nature; and because, at the same time too, they have not yet experienced much failure. And they mostly live by hope; for hope is of something future, memory of something past; and for the young the future is long, while the past is short—for in our early days nothing can be remembered but we can hope for everything. And they are easily deceived because of what was said; for they are easily hopeful. And they are more courageous [than the other two age groups]; for they are spirited and hopeful, the former of which makes them unafraid, the latter confident; for no one is afraid when he is angry, and to hope for something good is a source of confidence. And they are prone to shame; for they do not yet grasp other aspects of nobility, but have been well educated by the laws alone.

And they are great-souled; for they have not yet been humbled by life, but lack experience of its necessities; and to think oneself worthy of great things is greatness of soul, and this is characteristic of a hopeful person. And they choose to do noble things more than advantageous ones; for they live more by character than by rational calculation, and rational calculation has to do with what is advantageous, virtue with what is noble. And they love friends and love companions more than do people at the other stages of life, because they enjoy living with others and as yet judge nothing by reference to advantage, so that they do not judge friends that way either. **1389**[b]**1**

And all the errors they make are in the direction of being more and more intensely contrary to the maxim of Chilon; for they do everything too much; for they love too much, hate too much, and similarly all the others. And they think they know everything and confidently affirm things; for this is the cause of their doing everything too much. And the unjust actions they commit are from wanton aggression, not malice. And they are inclined to pity because of supposing everyone to be good or better than they in fact are; for they measure their neighbors by their own non-vice, and so suppose them to be suffering undeservedly. And they love laughter, which is why they are witty; for wit is well-educated wanton aggression.

Such, then, is the character of the young.

2.13
The Character of Old People

People who are older and pretty much past their prime have characters that are composed mostly of things that are contrary to those [in the characters of young people]; for, because they have lived for many years, have been more often deceived, have made more errors themselves, and because [they think that] most things are

bad, not only do they affirm nothing with assurance but everything with far less assurance[169] than they should. And they think things but know nothing. And being ambivalent, they always add "perhaps" and "maybe," and state everything that way, but nothing firmly.

And they are cynical; for cynicism consists in taking everything in the worst way. Further, they are suspicious because they lack trust, and lack trust because of their experience. And, because of these things, they neither love nor hate intensely but, following the advice of Bias,[170] love as if they would one day hate and hate as if they would one day love. And they are small-souled because of having been humbled by life (or they have an appetite for nothing grand or unusual but rather for things that are related to life). And they are ungenerous; for one of the necessities is wealth, and at the same time they know from experience that it is difficult to acquire and easy to lose. And they are cowardly and fearful about everything ahead of time; for their disposition is the contrary of that of the young; for they are chilly, while the latter are warm, and so old age has paved the way for cowardice; for in fact fear is a sort of chilling.

And they love life, and all the more so at the end of their days, because their appetite is for what is absent, and also because what they need is what they most have an appetite for. And they love themselves more than they should; for this too is a sort of smallness of soul. And, more than they should, they live with a view to what is advantageous and not to what is noble, because of their self-love; for what is advantageous is good for the individual, while what is noble is unconditionally so. And they are more shameless than prone to shame; for since they do not care equally about what is noble and what is advantageous they are contemptuous of their reputation.

And they expect the worst because of their experience (for most of the things that happen are bad, or at any rate, many things turn out for the worse), and because of their cowardice too. And they live by memory more than by hope; for what is left of life is short, what is past is long, and hope is for the future, memory for what is gone by. This is precisely the cause of their babbling; for they keep talking about things that have happened in the past; for it is by reminiscing that they get pleasure.

And their outbursts of spirit, though sharp, are weak. And while some of their appetites have forsaken them, others are weak, so that they are not appetitive people, or people who are inclined to act in accord with their appetites, but rather in accord with profit. That is why people of this age appear to be inclined to temperance, for their appetites have loosened their hold and they are slaves to profit. And they live more in accord with rational calculation than in accord with their character; for rational calculation has to do with what is advantageous, character with the virtues. And the unjust actions they commit are from malice, not wanton aggression.

169. Reading ἄγαν.

170. 1395a28–29 repeats this advice.

The old too are inclined to pity, but not because of the same thing as the young; for the latter are so because of a love of human beings, while the former are so because of weakness; for they think that all sorts of [bad] things are close at hand for themselves to suffer, and this, as we saw,[171] tends to arouse pity. As a result, they are inclined to be querulous and are neither witty nor lovers of laughter; for an inclination to querulousness is the contrary of a love of laughter.

Such, then, are the characters of the old and the young, and so, since all listeners welcome speeches adapted to, and resembling, their own characters, it is quite clear how speakers in the speeches they employ may appear to be such, both themselves and their speeches.

2.14
The Character of Those in Their Prime

It is evident that those in their prime will be intermediate in character between the other two, minus the excess: neither intensely confident (for a state of this sort is rashness) nor exceedingly fearful, but well-disposed in regard to both; neither trusting everyone nor mistrusting everyone, but rather judging them in accord with truth; neither living with a view only to what is noble nor only to what is advantageous, but with a view to both; and neither with a view to miserliness nor to wastefulness, but to **1390b1** what is fitting. And similarly in regard to spirit and in regard to appetite. And they are temperate accompanied by courage and courageous accompanied by temperance. For in the case of young people and old ones these have been divided; for the young are courageous and intemperate, while the older are temperate and cowardly. To speak in universal terms, whatever benefits youth and age have divided, those in their prime have both of, and whatever the former have an excess or deficiency of, the latter have in due measure and fittingly. The body is in its prime from the age of thirty to thirty-five, the soul at around forty-nine.

About youth, old age, and the prime of life, then, and what sorts of characters each has, let this much be said.

2.15
Good Breeding

Let us speak next about those among the goods that come about by luck due to which characters of a certain sort also result for people. The character that belongs to good breeding means that its possessor is more ambitious; for all people who have something to start with usually add to it, and good breeding is honor that derives

171. 1385b13–19.

from ancestors. Also, [men of such character] are inclined to despise even those who are the equals of their own ancestors, because the same things when they are further back in time rather than close at hand are more honorable and easier to boast about.

Good breeding is in accord with the virtue of the stock, while being true to one's stock is in accord with not being a degeneration from nature. For the most part, precisely this degeneration does not happen to the wellborn, although there are many who are worthless people; for in the generations of men, as in the fruits of the earth, there is a certain yield, and sometimes, when the stock is good, exceptional men are produced for a period of time, and then again later on [after a period of worthless ones]. Naturally clever stock degenerates into rather manic characters[172] (for example, the offspring of Alcibiades and of Dionysius), while steady stock degenerates into stupidity and sluggishness—for example, the offspring of Cimon, of Pericles, and of Socrates.

2.16
Wealth

The sorts of character that wealth is followed along with are on the surface for all to see; for in fact the wealthy are wantonly aggressive and arrogant, since they are affected somewhat by the possession of wealth; for their disposition is the same as if they possessed every good thing; for wealth is something like a standard of value for the other good things, which is why all of them appear to be purchasable by it. And they are luxurious and pretentious people: luxurious, because of their mode of life and their display of prosperity; pretentious and unrefined, because all of them are accustomed to spending their time on what they love and admire, and to thinking that others are emulously jealous of the same things as themselves. At the same time, their being affected in this way makes perfect sense; for there are many who need those who have wealth. Hence too the remark Simonides made about the wise and the rich to the wife of Hiero, when she asked whether it was better to be rich or wise. He replied, "To be rich." "For," he said, "we see the wise spending their time at the doors of the rich." And they think they deserve to rule; for they think they have the things on account of which one is worthy to rule. And, in sum, the character proper to wealth is that of a prosperous person who lacks understanding.

The characters of the nouveaux riches and those with old money differ, however, in that the nouveaux riches have all the vices to a greater degree and in a baser form; for nouveau richesse is, as it were, a lack of educatedness in wealth. And the unjust actions they commit are not malicious ones; rather, some are acts of wanton aggression while others are due to lack of self-control—for example, those that end in assault or adultery.

172. Not elsewhere attested in the examples mentioned.

2.17
Capacity

Similarly, with capacity, most of the characters it is followed along with are pretty much evident; for capacity has some of the same features as wealth, some that are better; for those who have capacity are more ambitious and more manly in character than the rich, because of aiming at all those works that they have the resources and the license to carry out in action because of their capacity. And they are more serious because of being in a supervisory position, compelled to keep an eye on the things related to their capacity. And they are more dignified than severe; for their worth makes them more dignified,[173] which is why they are more measured—dignity being a mild and gracious severity. And if they do unjust actions, they are not doers of small unjust actions, but doers of great unjust actions.

Good luck in its various parts includes the sorts of characters of those just mentioned, for the sorts of good luck that seem to be greatest tend toward these [characters]. And further, good luck makes one able to get more with regard to good children and the goods of the body. Although people are more arrogant and more non-rationally calculating because of good luck, there is one very good character trait that follows along with good luck: that of being lovers of the gods, and of standing in a certain relation to the divine, trusting in gods because of the things that have come about as a result of luck. **1391b1**

About the sorts of character having to do with stages of life and luck, let this much be said. For the contrary sorts are evident from what has been said—for example, the character of the poor, unlucky, or incapable.

2.18
Notions Common to All Kinds of Speeches

{The use of persuasive speeches is in relation to judgment (for about things we know and have already judged there is no further need of argument), and there is judgment even if someone by using a speech in relation to a single individual exhorts or dissuades him—for example, those giving advice or trying to persuade (for a single person is no less a judge; for the one we must persuade is the one who is—one might almost say—unconditionally a judge). And if someone speaks in relation to an opponent, or in relation to a proposed subject, the same is true; for it is necessary to use speech and to refute the contrary arguments in relation to which the speech is made as if they were precisely an opponent. It is the same way with epideictic ones; for the speech is composed in relation to the spectator as if in relation to a judge). In general, however, the only person who is unconditionally a judge is the one who in political

173. Reading σεμνοτέρους.

debates judges the things being inquired about (for he inquires about how things stand with the matters under dispute, and with the ones being deliberated about).}[174]
The characters that are in accord with the constitutions were spoken about earlier[175] in discussing deliberative speeches. So, as a result of all that, how and through what means one should make speeches expressive of character has been determined.

But since, as we saw, there is a different end for each kind of speech, and since with regard to all of them beliefs and premises have been collected from which speakers are to derive their means of persuasion in deliberative, epideictic, and disputatious speeches, and further, since we have also determined from which things it is possible to make speeches expressive of character, it remains to determine the common things;[176] for it is necessary for all [speakers] to in addition make use of the possible and the impossible in their speeches, and for some to try to prove that something will happen, others that it has happened. Further, the question of magnitude is common to all speeches; for all use diminishing and amplifying when deliberating, or when praising or blaming, accusing or defending. When these have been determined, we will try to say what we can about enthymemes in common, and about paradigms, in order that, having added what remains, we may deliver over what was proposed at the start.[177]

Among the common things, amplification most properly belongs to epideictic speeches, as has been said, the past to judicial ones (for past things are what the judgment is about), and the possible and the future to deliberative ones.

2.19
Possible and Impossible; the Past; the Future; Amplifying and Diminishing

First, then, let us speak about possible and impossible. If it is possible for one of the contraries to exist or to have happened, its contrary would also seem to be possible—for example, if it is possible for a person to become healthy, it is also possible for him to become ill; for the same capacity is for contraries, insofar as they are contraries. And if what is similar to another thing is possible, so too is the other thing. And if the more difficult thing is possible, so too is the easier one. And if something can come to be excellent and beautiful, it can also come to be in general; for it is more difficult for a beautiful house to exist than for a house to do so.

Also, if the starting-point of something is possible, so too is its end; for no impossible thing comes to be or starts to come to be—for example, the diagonal [of a rectangle] could not start to be, or be, commensurable. And if the end of something is possible, so too is its starting-point; for all things come to be from a starting-point.

174. Probably out of place.
175. 1.8.
176. I.e., the three common topics (1359a11–26).
177. 1.1–3.

And if what is posterior in substance or in coming to be can come to be, so too can what is prior—for example, if a man can come to be, so also can a boy (for the latter is prior in coming to be), and if a boy can, so too can a man (for a boy is also a starting-point).

Also, that for which there is by nature a love or appetite is possible; for, for the most part, no one loves or has an appetite for impossible things. And where there are sciences or crafts, it is possible for the subjects of these both to be or to come to be. And things are possible when the starting-point of their coming to be lies in things we can compel or persuade—and these are things we are stronger than, things we control, or friends.

Also, if the parts of something are possible, so too is the whole, and if the whole of something is possible, the parts for the most part are as well; for if sole, toe, and upper can be, shoes can also be, and if shoes can, so can sole, toe, and upper. And if the kind as a whole is among the possible things, so too is the form, and if the form is, so too is the kind—for example, if a ship can come to be, so can a trireme, and if a trireme can, so can a ship. And if one of two things that are naturally related to each other can, so can the other—for example, if double, also half, and if half, also double. **1392[b]1**

Also, if it is possible for something to come to be without craft knowledge or preparation, it is more so through craft knowledge and carefulness. Hence Agathon's saying:

> And indeed some things must be done by craft, others
> Accrue to us by necessity or by luck.[178]

And if something is possible for worse, inferior, or less practically wise people, it is more possible for their contraries; thus Isocrates said that it would be strange if he could not find out for himself something that Euthynous had learned [from others].

As for the impossible, it is clear that it comes about from the contraries of the things that have been stated.

The question of whether a thing has or has not happened should be investigated on the basis of the following. First, if what is naturally less disposed to happen has happened, what is more so should also have happened. And if what usually happens as posterior to another thing has happened, then the anterior thing has also happened—for example, if a person has forgotten something, he also once learned it. Also, if a person was capable of something and wished to do it, he has done it; for all people, when they wish something, and are capable of doing it, do it; for there is no impediment. Further, if a person wished to do something, and nothing external prevented him, or if he was capable of doing it and was angry, or if he was capable of doing it and had an appetite for it[, then he has done it]; for, for the most part, people do what they desire to do when they can—the base because of lack of self-control, the decent because the things they have an appetite for are decent. Also, if something was

178. Fr. 8 Nauck.

going to happen, and if a person was going to do something[, then he has done it]; for it is likely that a person who was going to do something also did it.

Also, if whatever by nature happens before a thing, or happens for the sake of it, has happened—for example, if lightning has occurred, so has thunder, and if a person tried to do something, he also did it. And if whatever by nature happens as posterior to a thing, or is what it happens for the sake of, has happened—for example, if thunder has, so has lightning, and if a person did something, he tried to do it. Among all of these, some are so by necessity, some for the most part.

As for what has not happened, it is evident [that it results] from the contraries of the things that have been stated.

And what will be in the future is clear from the same things; for what lies in both [our] capacity and wish will be. Also, those things that lie in [our] appetite, anger, or rational calculation, combined with the capacity to do them, [will be]. And those too that lie in impulse[179] or that are about to be done; for things that are about to be done are for the most part more likely to happen than those that are not about to be done. And if whatever things naturally happen before something have happened—for example, if it is cloudy, it is likely that it will rain. And if what is for the sake of the thing at issue has happened, it is likely that the thing has happened too—for example, if the foundation has been, then a house too.

As for the greatness or smallness of things, the more and the less, and the large and the small generally, they are evident to us from what was stated earlier;[180] for in the discussion of deliberative speeches we spoke about the magnitude of goods and about what is unconditionally larger or smaller. So, since of each sort of speech the proposed end is a good (that is to say, the advantageous, the noble, and the just), it is evident that every speaker must take the materials of amplification from these. But to go further beyond these, and to inquire about unconditional magnitude and superiority, is to argue emptily; for among the things at issue, the particulars are more controlling factors in relation to needs than the universals.

About the possible and the impossible, whether something has happened or has not happened, will or will not be, and further about the largeness or smallness of things at issue, let this much be said.

2.20
Means of Persuasion Common to All Kinds of Speeches

It remains to speak about the means of persuasion that are common to all, since the special ones have been stated. These common means of persuasion are two in form: paradigm and enthymeme; for a maxim is a part of an enthymeme. First, then, let

179. Reading ταῦτα καὶ ἐν ὁρμῇ.
180. 1.7.

us speak about a paradigm; for a paradigm is like an induction, and an induction is a starting-point.

There are two forms of paradigms; for to speak of things that have happened before is one form of paradigm, and to make one yourself is another. And of the latter, one sort is comparison and another fables—for example, the Aesopic and the Lybian.

Speaking of things that have happened before is something such as the following. If someone were to argue: It is necessary to make preparations against the king [of Persia] and not allow Egypt to be subdued; for in fact earlier Darius did not cross over [to Greece] until he had previously taken Egypt, while having taken it, he crossed over; and later Xerxes did not attack, until he had previously taken it, while having **1393ᵇ1** taken it, he invaded; so if the present king takes it, he will invade; that is why it must not be allowed.

Socratic arguments are cases of comparison. For example, if someone were to argue that officials should not be chosen by lot; for that would be like someone choosing athletes by lot—not those capable of competing, but those to whom the lot falls; or like choosing by lot one of the sailors to act as captain, on the grounds that it should be the one to whom the lot falls and not the one with scientific knowledge.

An example of fable is what Steisichorus said about Phalaris, and Aesop about the popular leader. For Steisichorus, when the people of Himera had chosen Phalaris as autocratic general, and were going to give him a bodyguard, after the many other things he said in the discussion, told them the following fable: A horse had a meadow to himself. A stag came along and damaged the pasture. The horse, wishing to avenge himself on the stag, asked a human if he could help him avenge himself on the stag. He said he could, if the horse accepted a bridle and he himself mounted up javelins in hand. When the horse agreed and the human mounted, instead of avenging himself the horse found himself enslaved to the human. "So you too," he said, "should look out, lest in wishing to avenge yourselves on your enemies you suffer the same thing as the horse. You already have on the bridle, having appointed an autocratic general. If you give him a bodyguard and allow him to mount up, from that moment you will already be enslaved to Phalaris."

Aesop, defending a popular leader in Samos who was on trial for his life, said the following: A fox, while crossing a river, was driven into a crevice in the bank and, not being able to get out, was for a long time in sore distress, and many dog-fleas had hold of her. A hedgehog, while wandering about, saw her and feeling a lot of compassion asked her if she would like him to remove the dog-fleas, but she would not allow it. When the hedgehog asked why not, she replied, "Because these are already full of me and draw little blood, but if you remove them, other hungry ones will come and drink the blood that is left to me." "You too, then," Aesop said, "men of Samos will suffer no more harm from this man (for he is rich). But if you put him to death, other poor ones will come, who will steal and squander your public funds." **1394ª1**

Fables are suited to the speeches of public oratory, and have this good feature, that while it is difficult to find similar things that have happened, it is easy with fables; for they should be produced in the same way as comparisons, provided one is capable of seeing similarity, which is precisely what is easy[181] on the basis of philosophy. But though examples that operate through fables are easier to provide, the ones that operate through things that have happened are more useful in deliberation; for future events are for the most part similar to past ones.

A speaker who does not possess enthymemes should use paradigms as demonstrations (for persuasion is through these), while the one who does possess them should use paradigms as witnesses, as supplementary arguments to the enthymemes; for when the paradigms are placed first, they look like an induction, but induction does not properly belong in rhetorical speeches, except in a few instances. As supplementary arguments, though, they look like witnesses, and a witness is persuasive in every context. That is also why, when they are put first, it is necessary to state many of them, although as a supplementary argument even one is enough; for even a single trustworthy witness is sufficient.

How many forms of paradigms there are and how and when they should be used has now been stated.

2.21
Maxims

As for the use of maxims, once it has been stated what a maxim is, it should be most evident about what, when, and for whom it is fitting to make use of maxims in speeches. A maxim is an affirmation, not though about particulars (for example, about what sort of person Iphicrates is), but about universals, and not about all of them (for example, that the straight is contrary to the crooked), but about the things that actions have to do with, and with things that are to be chosen or avoided with a view to doing an action. So, since the [relevant] enthymemes are pretty much a deduction about such things, the conclusions of the enthymemes or their starting-points, the deduction being omitted, are maxims. For example,

> A man naturally of sound mind should never
> Have his children taught to be too wise.[182]

This, then, is a maxim. But if the cause and the why are added, the whole thing is an enthymeme—for example,

> For apart from the various sorts of idleness they face,
> They incur the hostile envy from their fellow citizens.[183]

181. Reading ῥᾷον.
182. Euripides, *Medea* 194–195.
183. Euripides, *Medea* 296–297.

And this: **1394ᵇ1**

> There is no man who is happy in everything.[184]

And this

> There is none among men who is free

is a maxim, although taken with what follows

> For he is a slave either of money or of luck,[185]

it is an enthymeme.

If, then, a maxim is the thing mentioned, there are necessarily four forms of maxims; for the maxim is either with or without a supplementary argument. Those that need a demonstration are those that say something unacceptable or disputable, while those that say nothing unacceptable are without a need for a supplementary argument. Some of these, because of being already known, necessarily need no supplementary argument—for example,

> Being healthy is the best thing for a man, so it seems to me.[186]

(for it appears that way to many people). Others, as soon as they are uttered, are clear to those who look at them carefully—for example,

> No one is a lover who does not love always.[187]

Among those with a supplementary argument, some are part of an enthymeme, as is,

> A man naturally of sound mind should never . . . ,

while others are enthymematic but not part of an enthymeme, and are the very ones that are most popular. These are the ones in which the cause of what is said is made apparent, as it is, for example, in "Being a mortal, one should not hold fast to immortal anger";[188] for to say "Do not hold fast . . ." is a maxim, and the addition "being

184. Euripides, *Stheneboea*, Fr. 661 Nauck.
185. Euripides, *Hecuba* 894–895.
186. Ascribed to Epicharmus (Fr. 262 Kaibel) by some and to Simonides (Fr. 146 Page) by others.
187. Euripides, *Trojan Women* 1051.
188. Source unknown.

a mortal" is the why. Similarly with "A mortal should think mortal not immortal thoughts."[189]

It is evident, then, from what has been said, how many forms of maxims there are and what each sort is fitting for; for about disputed or unacceptable things they should not be without a supplementary argument, but the supplementary argument may be put first and the maxim used as a conclusion—for example, if someone were to say, "As for me, then, since one should neither be the object of envy nor be idle, I say that children should not be educated"—or the maxim may be stated first and the supplementary argument stated after it. About matters that are not unacceptable yet not clear, the why should be added as tersely as possible. In such cases both Laconic apothegms and riddles are fitting—for example, if someone were to say precisely what Steisichorus said to the Locrians, that they should not be wantonly aggressive, lest their cicadas sing from the ground.[190]

The use of maxims is fitting for people who are older in age and about matters a person has experience of, so that to make use of maxims is—like telling stories—unseemly for someone not of such an age, and to make use of maxims about things in which one lacks experience is silly and shows lack of education. Here is a sufficient sign of this: boors are especially fond of coining maxims and ready to show them off.

To speak in universal terms of what is not universal is especially fitting in outrage and indignation, and, in these cases, either at the start or after the demonstration. And one should also use oft-repeated and common maxims, if they are useful; for because they are common, and as everyone agrees, they seem to be correct. For example, it is fitting for someone who is exhorting his troops to face danger without sacrificing to the gods to say "One omen is best, to defend one's fatherland."[191] And, if they are outnumbered, "The War God is impartial."[192] And, if exhorting them to destroy the sons of their enemies even though they have done no injustice, "Foolish is he who having killed the father leaves behind the sons."[193] Further, some proverbs are also maxims—for example, "an Attic neighbor."[194]

One should also use maxims that are contrary to the ones that are public property (by those that are "public property" I mean ones like "know thyself" and "nothing too much"), whenever the speaker's character is likely to be made to appear better, or the maxim to be stated with feeling. An example of a maxim stated with feeling is if someone in anger were to say "It is false that one should know oneself, since, at any

189. Advice, attributed by some to Epicharmus (Fr. 263 Kaibel), that Aristotle himself thinks we should *not* follow (*NE* 1177b31–1178a2).
190. I.e., lest their city be razed to the ground. Also 1412a23.
191. Homer, *Iliad* 12.243.
192. Homer, *Iliad* 18.309.
193. *Cypria* Fr. 31.
194. Probably, in the negative sense, that with a neighbor like the aggressive inhabitants of Attica, one had no need of enemies.

rate, this man,[195] if he had known himself, would never have thought himself worthy to be a general." And his character [would appear] better [if he were to say] "one should not, as people say, love as if one will one day hate, but rather hate as if one will one day love."[196] And one should make one's deliberate choice completely clear by one's wording, or else one should state the cause in a supplementary argument, saying, for example, "One should not love in the way people say, but as if one were always going to love; for the other is characteristic of a traitor"; or this, "The saying does not please me; for the true lover should love as if he were always going to love"; or "'Nothing too much' does not please me either; for one should hate bad people too much."

Maxims have great help to give to speeches and the first is due to the unrefinement **1395^{b}1** of the listeners; for people enjoy it if someone speaking in universal terms hits upon beliefs that they themselves hold about a particular case. What I mean will be clear from the following, as at the same time will be how one should hunt for maxims. A maxim, as has been said, is a universal affirmation, and people enjoy things said in universal terms that they happen to assume beforehand in particular cases—for example, if someone happened to have bad neighbors or bad children, he would welcome someone saying that nothing is worse than having neighbors or that nothing is sillier than begetting children. So one should aim to discover the sorts of things people happen to assume beforehand and then speak in universal terms about these things in the way described.

This, then, is one sort of the use of maxims. And another is stronger; for it makes speeches be expressive of character. And speeches involving character are those in which the deliberate choice is clear, and all maxims make it so, because the one stating the maxim makes evident a universal fact about the objects of deliberate choices. So if the maxims are good, they make the speaker appear to have a good character.

As regards maxims, then, what they are, how many forms of them there are, how they should be used, and what sorts of benefits they have, let this much be said.

2.22
Enthymemes

Let us now speak about enthymemes in universal terms, that is, in what way one should seek them, and after that about the topics; for each of these two is distinct in form.

That the enthymeme is a sort of deduction was stated earlier,[197] and in what way it is a deduction, and in what respect it differs from those in dialectic; for it should not draw its conclusion from far back, nor by necessarily including everything; for the

195. The reference may be to Iphicrates.
196. Also 1389^{b}23–24.
197. 1355^{a}8, 1356^{b}4.

former is not perspicuous because of length, while the latter amounts to babbling, because one says evident things. That is the cause of the uneducated being more persuasive than the well educated in front of crowds of people—as the poets tell us, the uneducated are "more accomplished at speaking before a crowd."[198] For the well educated say the common things and universals, while the uneducated say things on the basis of what they know and things close at hand. So one should not speak on the basis of all the things that seem to be so, but on the basis of the things that seem to be so to definite groups of people—for example, to the judges or to those they approve. And in fact it should be clear that what is said appears so either to all or to most. And one should not only draw the conclusion from what is necessary, but also from what holds for the most part.

First, then, one should grasp that about whatever subject one has to speak or deduce, whether the subject of the deduction is political[199] or anything else whatever, it is necessary to have facts concerning it, either all of them or some of them; for if you have none of these, you will have nothing to draw a conclusion from. I mean, for example, how could we advise the Athenians whether they should go to war or not without knowing what their capacity is, whether naval or infantry or both, and how great it is, and what revenues or friends and enemies they have, further, what wars they have fought and in what way, and other such things? Or praise them, if we did not have [as a fact] the sea battle at Salamis or the battle at Marathon, or what they did for the children of Heracles, or something else of that sort. For all people praise on the basis of noble things that are, or seem to be, facts. Similarly, people blame the Athenians on the basis of the contraries, looking for one that applies to them or seems to—for example, that they enslaved the Greeks and sold into slavery those who had fought with them against the barbarian and gained the prize for valor (the inhabitants of Aegina and Potidaea), and other such things—and whether some other error of this sort is attributed to them. Similarly, those accusing and those defending accuse and defend on the basis of the relevant facts after examining them.

And it makes no difference whether it concerns Athenians or Spartans, human or god; one should do the very same thing; for also in advising Achilles and in praising or blaming him and in accusing or defending him, one must grasp the relevant facts, or what seem to be facts, about him, in order to say on the basis of these, when praising or blaming, if there is anything noble or shameful [in his case], or, when accusing or defending, anything just or unjust, or, when advising, anything advantageous or harmful. And the same is true of any thing at issue whatever—for example, about justice, whether it is good or not good, [one should speak] on the basis of the facts relevant to justice and the good.

So, since it is evident that everyone does indeed demonstrate in this way, whether they deduce in a more exact or in a more loose fashion (for they do not take from

198. Euripides, *Hippolytus* 989.
199. Rejecting the addition of ἐν.

all the facts but from facts relevant to the given case), and since it is clear that it **1396ᵇ1**
is impossible through argument to prove anything in any other way, it is evident
that it is first necessary, as in the *Topics*, to have selected [premises] relevant to the
given case concerning possible points [of discussion] and the ones that are most
opportune. And, as regards things happening on the spur of the moment, one must 5
seek [premises] in the same way, looking not to indefinite things but to the facts
the argument is about, marking off as many facts as possible and the ones closest to
the thing at issue; for the more of the relevant facts are in hand, the easier the proof
is, and the closer they are, the more properly they belong [to the thing at issue] 10
and are less common. By "common facts" I mean, for example, praising Achilles
because he was a human being, because he was one of the demigods, or because he
went on the expedition against Troy; for these apply to many others as well, so that
such a speaker does not praise Achilles any more than Diomedes. Special facts, by
contrast, are ones that apply to no one other than Achilles—for example, having 15
killed Hector, the best of the Trojans, and of Cycnus, who prevented all the Greeks
from disembarking and was invulnerable, and because he was the youngest who
went on the expedition and the one who went without having sworn, and anything
else of this sort.

One way, then, of selecting, the first one, is this: the topical. Let us now speak of 20
the elements of enthymemes. And by "element" and "topic" of an enthymeme I mean
the same thing. But, first, let us say some things that are necessary to say first.
For there are two forms of enthymemes; for one lot are suited to proving that some-
thing is or is not the case, while another lot are refutative, and the difference is like
that in dialectical ones between refutation and deduction.[200] A probative enthymeme 25
draws its conclusion from what is agreed to, while one suited to refuting draws
conclusions that are disagreed with.

The topics concerning each of the forms that are useful and necessary are pretty
much in our possession; for premises concerned with each have been selected, so 30
that the topics on the basis of which enthymemes should be derived concerning
good or bad, noble or shameful, just or unjust, and concerning characters, feel-
ings, and states, which were earlier selected by us[201] in the same way, are already
on hand.

Still, let us now get a grasp on all these in another way—that is, universally—and **1397ᵃ1**
let us speak taking note of the refutative ones and the ones suited to proving, and of
those belonging to apparent enthymemes, which are not really enthymemes, since
they are not even deductions. When these things have been made clear we will make
determinations[202] about refutations and objections, and on what basis one should 5
bring them against enthymemes.

200. *SE* 171ᵃ1–5.
201. 1.4–14, 2.2–17.
202. 2.25.

2.23
Topics for Enthymemes

One topic belonging to probative enthymemes is that based on contraries; for one should look to see if the contrary belongs to the contrary, doing away with it if it does not belong, establishing it if it does—for example, saying that to be temperate is a good thing; for to lack self-control is a harmful one. Or, as in the *Messianicus*: "For if the war is the cause of the present evils, with peace they should be put right." Or—

> For if indeed it is not just even for those
> Who did evil involuntarily to anger us,
> Then it is not fitting for someone who is compelled to do good
> To be shown gratitude for the benefit he conferred.[203]

Or—

> But if indeed, old man, among mortals false speaking
> Is persuasive, you should believe the opposite too,
> That many truths are unpersuasive to mortals.[204]

Another is based on the different inflections of the same word; for it is necessary for them to belong or not belong in the same way [to the subject]—for example, to say that what is just is not good in every respect; for then even the just would also be good [in every respect], while as things stand to be put to death justly is not choiceworthy.

Another is based on correlatives; for if doing something nobly or justly belongs to one of a pair, to have suffered in a correlative way belongs to the other, and if prescribing belongs to one, doing belongs to the other—as, for example, what Diomedon the tax collector said about taxes: "If it is not shameful for you to sell, neither is it shameful for me to buy."[205] And if suffering nobly or justly belongs to one, producing it in a correlative way belongs to the other. But there is in this the possibility of fallacy; for if someone has suffered something justly, he has justly suffered,[206] but perhaps not at your hands. That is why one should look separately to see whether the sufferer suffered deservedly and the producer produced deservedly, and then to make use of whichever fits the case; for sometimes there is disagreement in a case of this sort and nothing prevents a reply like this in the *Alcmeon* of Theodectes: "Did no one of the mortals loathe your mother?" [Alphesiboa asks. And Alcmaeon says] in reply: "But

203. Source unknown.
204. Euripides, *Thyestes*, Fr. 396 Nauck.
205. Greek cities sometimes sold the right to collect taxes to individuals who aimed to profit thereby.
206. Reading δικαίως πέπονθεν.

one should investigate by dividing." And when Alphesiboa asks how, he understands and replies: "They judged that she should die, but not that I should kill her." {Also, the trial of Demosthenes and those who killed Nicanor; for since the jury judged that they had justly killed him, they believed him to have been justly killed. Also, the case of the man killed at Thebes, where the accused demands that a judgment be made as to whether he died justly, on the supposition that it was not unjust to kill someone who died justly.}[207]

Another is based on the more and the less. For example, "If not even the gods know everything, human beings can much less do so"; for this is to say "if something does not belong to what it should more belong to, it is clear that neither does it belong to what it should less belong to." And that someone who beats his father also beats his neighbors follows from "if the less belongs, the more belongs too"; for men beat their fathers less than they beat their neighbors. Or one may argue in this way, if what more belongs does not belong, [what less belongs does not], or if what less belongs does belong, [so does what more belongs], depending on which of the two one needs to prove.

Further, that there is neither more nor less, on the basis of which it was said:

> Your father too is pitiable for having lost his children;
> Is Oeneus, then, not also pitiable for having lost an illustrious offspring?[208]

And that, if Theseus did no injustice, neither did Paris, and if the sons of Tyndareus did none, Paris did none, and if Hector did none to Patroclus, Paris did none to Achilles. And if other craftsmen are not base, neither are philosophers. And if generals are not base because they are often put to death, neither are sophists. And that "if a private individual should care about your reputation, you too should care about that of the Greeks."

Another is based on looking at time—for example, what Iphicrates said in the speech against Harmodius: "If I had asked for a statue when I will accomplish the thing, you would have granted it. Will you not grant it now that I have accomplished it? Do not, therefore, grant when you expect something, and rescind when you have received it." Again, against Thebans [not allowing] Philip to pass through into Attica: "If he had made this request before helping them by moving into Phocis, they would have granted it. It is absurd, then, because he gave up the opportunity and trusted them, that they will not let him pass through now."

Another is based on turning what has been said about oneself against the speaker. But the turn differs, for example, in the *Teucer* and in the argument Iphicrates used against Aristophon. He asked the latter if he would betray the fleet for money. He

207. Perhaps to be read after 1397ᵃ23–27.

208. Perhaps from Antiphon's lost *Meleager* (1399ᵇ26–28). Oeneus was the father of Meleager, who killed Plexippus, the brother of Althaea and wife of Oeneus, and was killed by Althaea in revenge. The lines are thought to be addressed to Althaea by Oeneus.

denied it. And then Iphicrates said, "If you, Aristophon, would not betray it, would I, Iphicrates, do so?" But the opponent must be one who would seem more likely to do injustice; if he is not, it would be ridiculous—for example, if one were to say this to Aristides as accuser. But against the trustworthiness of an accuser [of the former sort, it works well]; for, in general, the accuser wishes to be better than the defendant. This, then, should be refuted. It is universally absurd, however, when someone reproaches others for what he himself does, or would do, or exhorts others to do what he himself does not, or would not, do.

Another is based on definition—for example, of what the daimonic is: Is it not a god or the work of a god? And yet whoever thinks that a work of a god exists must think that gods also exist. And as Iphicrates argued that the best person is the most well-bred one; for even Harmodius and Aristogeiton had nothing well-bred about them until they did something well-bred in action, while he himself was bred more like them: "At any rate, my works are more like those of Harmodius and Aristogeiton than yours are." And, as in the *Paris*,[209] that all would agree that all those who are not moderate are not content with indulging in one [woman's] body. Also, why Socrates said he did not visit Archelaus; for he said that wanton aggression is a matter of not being able to repay equally even when one is treated well, as it also is when one is treated badly. For all these speakers by defining and grasping the what-it-is deduce things about the subject they are talking about.

Another is based on the many ways—as, for example, in the *Topics* concerning "sharp."[210]

Another is based on division—for example, if everyone does injustice for the sake of three things (this, this, or this), and because two of them are impossible in the present case, and because not even the accusers themselves affirm the third. . . .

Another is based on induction—for example, from the case of the woman of Peparethus. [It is argued] that women everywhere determine the truth about the paternity of children; for when the speaker Mantias was disputing in Athens about the paternity of a child, the child's mother made known the truth. Similarly, when Ismenias and Stilbon were disputing in Thebes, the woman of Dodona demonstrated [this when she] identified her son as being the son of Ismenias, and because of this Thettaliscus was acknowledged as Ismenias' son. And, again, from the *Law* speech of Theodectes:[211] "If people do not entrust their own horses to those who have taken bad care of the horses of others, nor their own ships to those who have capsized the ships of others, then, if this is likewise so in all cases, one should not employ for one's own preservation those who have badly guarded the preservation of others." And, as Alcidamas argued, that all honor the wise: "The Parians, at any rate, honored Archilochus although he slandered them; the Chians Homer, although he was not a

209. Of Polycrates.

210. 106a13–17.

211. The speech seems to have been against hiring mercenaries.

citizen; the Mytileneans Sappho, although she was a woman; the Spartans even made Chilon one of their senators although they are least fond of words; and the Italians, Pythagoras;[212] the Lampsacenes buried Anaxagoras, although he was a foreigner, and still honor him even now; {the Athenians were prosperous while they made use of the laws of Solon, and the Spartans those of Lycurgus; and at Thebes, as soon as the leading men became philosophers the city prospered."}[213]

Another is based on a judgment about the same, a similar, or a contrary case, especially when all always [judge in that way]—but if not, at any rate, when most do, or the wise (either all or most of them), or the good, or if these judges themselves do, or those these judges approve, or those one cannot judge contrary to (for example, those with the controlling vote), or those it would not be noble to judge contrary to (for example, the gods, a father, or teachers—as Autocles said against Mixidemides: "It is [a terrible thing] if it was fine for the Dread Goddesses[214] to stand trial before the Areopagus but not for Mixidemides"). Or as Sappho said, that it is bad to die; for the gods have so judged; for otherwise they would die. Or as Aristippus did against Plato when he said something too professorially: "But our companion," he said, "never spoke like that"—meaning Socrates. And at Delphi Agesipolis consulted the god, having previously consulted the oracle at Olympia, as to whether his belief was the very same as his father's, on the supposition that it would be shameful to say contrary things. And as Isocrates wrote about Helen, that she was good, if indeed **1399ᵃ1** Theseus so judged, and about Paris, whom the goddess judged to be better than others; and about Evagoras, that he was excellent, as Isocrates said; at any rate, when Conon suffered bad luck, leaving others aside, he came to Evagoras for help.[215]

Another is based on the parts, as in the *Topics*.[216] What sort of movement is the soul? For it is this or that. There is a paradigm in the *Socrates* of Theodectes: "What holy place has he profaned? Which gods that the city acknowledges did he not honor?"

Another—since in most cases the same thing is followed by good and bad—is to exhort or dissuade, accuse or defend, and praise or blame on the basis of consequences. For example, being educated is followed by being envied, which is a bad thing, while to be wise is good: therefore, one should not be educated, for one should not be envied; or certainly one should be educated, for one should be wise. This topic constitutes the craft of Callippus, with the addition of the possible and the other things that have been mentioned.

Another is when one needs to exhort or dissuade about two things that are opposites, and one needs to use the way[217] mentioned in the previous case in both. But the

212. Reading καὶ Ἰταλιῶται Πυθαγόραν.
213. There may be a lacuna in the text prior to this, since it seems not to fit in well with the previous argument.
214. I.e., the Furies.
215. *Evagoras*, 51–52.
216. 111ᵇ5–11.
217. Reading τρόπῳ.

difference is that there random things are opposed, while here they are contraries. For example, a priestess did not allow her son to speak publicly: "For," she said, "if you say what is just, the people will hate you; and if what is unjust, the gods will. Certainly, you should speak publicly; for if you say what is just, the gods will love you; and if what is unjust, people will." This is the same as the saying, "Buying the marsh with the salt."[218] The turning inside out consists in this: when each of two contraries is followed by a good and an evil, [apply] each contrary to each.

Another—since people do not praise the same things openly as they do non-openly, but openly praise the just and the noble most of all, while in private they wish more for what is advantageous—is on the basis of these to try to draw on each; for among the ones that are unacceptable, this topic is the most controlling one.

Another is based on analogical consequences—for example, when they tried to compel his son, who was younger than the required age, to perform public service because he was tall, Iphicrates argued that if they consider tall boys to be men, they should vote that short men are boys. And Theodectes in the *Law* speech argued: "Since you are making citizens of mercenaries, such as Strabax and Charidemus, because of their decency, will you not make exiles of those among the [citizen] mercenaries who have done irreparable harm?"

Another is based on [arguing] that if what results is the same, the things from which it resulted are also the same—for example, Xenophanes said that those who say that the gods are born and those who say that they die are equally impious; for in both cases it results that at some time gods do not exist. And, in general, one should take the result of each of the relevant things as always the same: "You are going to make a judgment not about Isocrates, but about education, as to whether one should study philosophy."[219] And that to give "earth and water"[220] is to be a slave, and that to share in "the common peace" is to do what is commanded.[221] And one should take whichever of the two is useful.

Another is based on the fact that people do not always choose the same thing before as after, but rather the reverse one—for example, the following enthymeme: "When in exile, we fought to return home, but having returned, we are to go into exile in order to avoid fighting!"[222] For at one time they chose to be at home at the cost of fighting, and at another time not to fight at the cost of not being at home.

Another is to say that that for the sake of which something might exist or might have come to be is that for the sake of which it does exist or did come to be—as if someone gave something to someone in order to cause him pain by taking it back. Hence it has been said:

218. I.e., you must take the bad with the good.
219. The reference seems to be to Isocrates, *Antidosis* 170–175.
220. The Persians demanded earth and water as a symbol of submission to their control.
221. Probably the peace forced on Greek cities by Macedon after the battle of Chaeronea in 338 BC, which was not completely ratified until 336.
222. Apparently an adaptation of Lysias 34.11.

It is not out of goodwill that the divine,
Gives great good luck to many, but in order that
The misfortunes they suffer be more evident.[223]

And, from the *Meleager* of Antiphon:

Not in order to kill the beast, but to be witnesses
Of the virtue of Meleager to Greece.

And, from the *Ajax* of Theodectes, that Diomedes deliberately chose Odysseus not in order to honor him, but in order that his companion might be inferior to him; for he could have done it for the sake of this.

Another, common to opponents [in court] and deliberative speakers, is to look to see what the incentives and the disincentives are, and for the sake of what people do things or avoid doing them, and these are the things that, if present, one should do the action, and if not present, then one should not do it. For example, if it is possible, easy, or beneficial either to oneself or to friends, or harmful to enemies, or, if it is punishable, the punishment is less than the thing at issue. And people are given an incentive on the basis of these, and a disincentive on the basis of their contraries. And accusation and defense are based on the same ones: they defend themselves on the basis of the disincentives and accuse on the basis of the incentives. This topic is the whole craft of Pamphilus and Callippus.

Another is based on things that are believed to have occurred but are unpersuasive, because they would not have been believed had they not actually occurred or nearly so—in fact, that they are more likely to have occurred; for people [only] accept things that really exist or that are likely to exist. If, then, something were unpersuasive and not likely, it would be true; for it is not because of being likely or being persuasive that it seems so [but because it is true]. For example, when Androcles of Pitthus spoke against a law, since he was shouted at, he said: "Laws need a law to rectify them, for even fish need salt" (and yet it is neither likely nor persuasive that creatures reared in saltwater would need salt), "and pressed olives need oil" (and yet it is unpersuasive that things from which oil comes need oil).

Another is refutative: looking for inconsistencies, to see whether there is any inconsistency among all the times, actions, or words.[224] First, separately, regarding the opponent [in court]—for example, "And he says he loves you, but he conspired with the Thirty." Next, separately, regarding [the speaker himself]: "And he says that I am litigious, but he cannot demonstrate that I have brought a case to be judged." Next, separately, regarding both the speaker himself and the opponent: "He has never put up any money, but I have ransomed many of you."

223. Source unknown.
224. Slightly rearranging Kassel's text.

Another, for people or things at issue against whom negative prejudices have been, or seem to have been, raised beforehand, is to state the cause of the prejudicial belief; for it must appear so because of something. For example, when a certain woman, who had palmed off her own child as another's, seemed to be the lad's lover because of clinging fondly to him, but when the cause was stated, the accusation was refuted. Another example is in the *Ajax* of Theodectes: Odysseus tells Ajax why, though he is more courageous than Ajax, he does not seem so.

Another is from the cause: if it exists, [arguing] that the effect does, and if it does not, that the effect does not; for the cause and what it is cause of go together, and nothing can exist without a cause. For example, when Leodamas was defending himself against Thrasybulus' charge that his name had been inscribed on a column on the Acropolis,[225] but had been erased in the time of the Thirty. That was not possible, he said; for the Thirty would have trusted him more if his enmity for the people had remained inscribed.

Another is to look to see whether it was possible or is possible for the action that someone advises, or is doing or has done, to be done in a better way; for it is evident that if this is not so,[226] he did not do the action; for no one voluntarily and knowingly deliberately chooses the bad things. But this is [sometimes] false; for often it later becomes clear how things could have been done better, while earlier it was unclear.

Another, when an action is about to be done that is contrary to what has been done, is to look at them together—for example, when the people of Elea asked Xenophanes if they should sacrifice and sing dirges to Leucothea or not, he advised them not to sing dirges if they took her to be a god, and not to sacrifice if they took her to be a human being.

Another topic is to accuse or defend on the basis of errors that have been made. For example, in the *Medea* of Carcinus,[227] some accuse Medea on the grounds that she has killed her children—at any rate, they are nowhere to be seen; for Medea made the error of sending her children away. But she defends herself on the grounds that it is not her children but rather Jason that she would have killed; for she would have made an error in not doing so, if in fact she had done the other thing. This topic and form of enthymeme constituted the whole craft before Theodorus.

Another is from the name—for example, as in Sophocles: "Clearly you are iron as the name you bear."[228] And, as people are accustomed to speak in praises of the gods, or as Conon called Thrasybulus "daring in council (*thrasuboulon*)," or as Herodicus said to Thrasymachus, "You are always daring in battle (*thrasumachos*)," and to Polus, "You are always a colt (*polos*)," and of Draco the legislator that his laws were not those of a human being but of a snake (*drakôn*) (for they were harsh). Also, as Hecuba in Euripides says to Aphrodite: "And rightly does the name of the goddess

225. The names of traitors were so inscribed.
226. Reading εἰ μὴ οὕτως ἔχει.
227. Apparently, in this version, Medea did not kill her children.
228. Fr. 597 Nauck. *Sidêros* means "iron."

start like 'foolishness (*aphrosunês*)'."[229] And as Chaeremon said: "Pentheus, named for his future misfortunes."[230]

Refutative enthymemes are more popular than demonstrative ones because a refutative enthymeme is a bringing together of contraries in a small space, and when these are set side by side they are more evident to the listener. But of all deductions, whether refutative or demonstrative, the most applauded are those of the sort the listeners foresee the moment they start, as long as they are not superficial (for at the same time people are also pleased with themselves for pre-perceiving the conclusion), and those of the sort that they are late in apprehending, so that they know them the moment they are stated.

2.24
Topics for Apparent Enthymemes

Since it is possible for a thing to be a deduction or for another thing not to be one, but to appear to be one, necessarily, it is also possible for a thing to be an enthymeme and for another thing not to be one, but to appear to be one, since indeed an enthymeme is a sort of deduction. And there are topics for apparent enthymemes.

One depends on the mode of expression, and one part of this, just as in dialectical **1401ª1** ones, is when what is ultimately stated, though not deduced, is said in the form of a deductive conclusion: "Therefore, such-and-such is not so," "Therefore, such-and-such must be so." Similarly, in the case of enthymemes, stating something tersely and antithetically makes it appear to be an enthymeme; for a mode of expression of this sort is the province of enthymemes. And that something of this sort seems so depends on the figure of the mode of expression. With regard to speaking deductively in one's mode of expression it is useful to state the crowning points of a number of deductions: "He saved some, avenged others, and freed the Greeks"; for each of these has been demonstrated from other things, but when they are put together something appears to result from them too. The other part is by exploiting homonymy: saying that the mouse (*mus*) is excellent, since from it is derived the most estimable of all festivals; for the Mysteries (*musteria*) is the most estimable festival of all. Or if someone composing an encomium for a dog were to include the Dog Star or Pan in their account, because Pindar said: "O blessed one, whom the Olympians call 'dog,' multifarious, of the Great Goddess." Or to say that to be without a dog is the greatest dishonor, so it is clear that the dog is estimable.[231] Or that Hermes is the most sociable (*koinônikos*) of the gods; for he alone is called "the common (*koinos*)

229. *Trojan Women* 990.

230. The word *penthos* means "misfortune" or "sorrow."

231. The precise meaning is unclear. However, a piece in the game of *poleis*, thought to resemble backgammon, was called a "dog." So that being without a dog would be to have no piece left in the game.

Hermes."[232] Or that speech (*logos*) is the most excellent thing, because good men are worthy of esteem (*logou axioi*), not of money; for the expression *axion logou* is not said of things in a simple way.[233]

Another is for the speaker to combine what is divided or to divide what is combined; for since what is not the same often seems to be the same, whichever is more useful should be done. This is Euthydemus' [kind of] argument—for example, claiming to know that there is a trireme in the Piraeus; for he knew each of the [three] things involved.[234] And claiming of the one knowing the letters that he knows the word; for the word is the same as these. Also, saying that since two doses of something cause illness, one dose is not healthy either: for it would be absurd if two goods equaled one evil. Put this way it is for refutation, but it is for proving in the following one: for two goods do not equal one evil. But the whole topic is fallacious. Again, what Polycrates said in regard to Thrasybulus, that he deposed thirty tyrants; for he combines. Or what is in the *Orestes* of Theodectes; for it is a case of division: "It is just that she who has killed her husband" should die; and for the son to avenge the father; these things, then, have been [justly] done.[235] But perhaps when they are combined, it is no longer just. This would also be one by omission; for it leaves out the by whom.[236]

Another topic is establishing or disestablishing an argument by exaggeration. This is when, without proving that someone did something, one amplifies the thing at issue; for when the accused amplifies it he makes it appear that he has not done the action, or that he has done it, when the accuser amplifies it.[237] There is, then, no enthymeme; for the listener fallaciously reasons that someone has done it, or that he has not done it; but this has not been proved.

Another is based on a sign; for this one too is non-deductive—for example, if someone were to say: "Lovers are advantageous to cities; for the love of Harmodius and Aristogeiton destroyed the tyrant Hipparchus." Or if someone were to say that Dionysius is a thief for he is wicked; for this of course is non-syllogistic; for not every wicked person is a thief, although every thief is wicked.

Another is through what is coincidental—for example, Polycrates says of mice that they helped by gnawing bowstrings.[238] Or if someone were to say that being invited to dinner is the most estimable thing; for Achilles' rage at the Achaeans in

232. If treasure, or anything else of value, chanced to be found, those present cried *koinos Hermês* as a way of claiming a share of the find.
233. *Logos* means both "speech" and "esteem."
234. A slightly more complex version of the argument is given at *SE* 177b12–13.
235. It was just for Clytemnestra to be killed for murdering her husband Agamemnon; it was just for Orestes to avenge the murder of his father Agamemnon; but it was not therefore just for both to happen (since that involves Orestes killing his mother).
236. It is just for Clytemnestra to be killed. But by whom? Theodectes leaves this out, and so commits a fallacy by omission.
237. Reading αὔξῃ.
238. I.e., they helped the Egyptians by gnawing the bowstrings of the invading Assyrians.

Tenedos was because of his not being invited; but he was enraged because he was dishonored, and being dishonored was coincidental to not being invited.

Another is by [affirming] the consequent—for example, in the *Paris*,[239] the argument that Paris was great-souled; for, looking down on social interaction with ordinary people, he passed his time on Mount Ida by himself; for because great-souled people are like this, he too should be believed to be great-souled. And: when someone is well-dressed and wanders around at night, he is an adulterer; for adulterers are like this.[240] The same is true of the fact that in front of temples beggars sing and dance, and that exiles can live wherever they like; for because these things belong to those who seem to be prosperous, the people to whom these things belong might seem to be prosperous too. But there is a difference in how [they belong],[241] which is why this too falls under omission.

Another is by taking a non-cause as a cause—for example, when the thing has happened at the same time as another or after it; for people take the coming-after-something as being because-of-something, and especially political policy makers—for example, as Demades took the policy of Demosthenes to be the cause of all evils; for it is after it that the war came.

Another is by omission of how and when—for example, arguing that Paris took Helen justly; for the choice had been given to her by her father; for presumably it was not given for ever, but for the first time; for a father's control extends indeed to this point. Or if someone were to say that it is wanton aggression to strike free people; for it is not so always, but when someone strikes the first blow unjustly.

Further, as in contentious arguments, an apparent deduction results by taking the unconditionally so and the not unconditionally so, but so in a certain respect—for example, in dialectical arguments, that what is not is (for what is not *is* what is not) and that the unknowable is scientifically knowable (for it is scientifically knowable that the unknowable *is* unknowable)—in rhetorical arguments as well there is an apparent enthymeme by taking the not unconditionally likely but likely in a certain respect. But this latter is not universally likely, as Agathon too says:

> Perhaps one could say that the thing itself is likely;
> To mortals many things happen that are not likely.[242]

For what is contrary to the likely does also occur, so that even what is contrary to the likely is likely. And if this is so, what is not likely will be likely. But not unconditionally so. Instead, as in contentious arguments, not adding with respect to, in

239. Of Polycrates.
240. *SE* 167ᵇ8–12.
241. Beggars sing and dance out of the necessity of getting a handout; exiles live where they like out of the necessity of leaving their homeland; the prosperous do these things because they are free to do them.
242. Fr. 9 Nauck.

relation to, and where, produces sophistry, as does the fact here that the likely is not unconditional but likely in a certain respect.

The craft of Corax is based on this topic; for if a person is not liable to be guilty of the charge (for example, if a physically weak person is accused of assault), he should be acquitted of the charge; for it is not likely; and if he is liable to be guilty (for example, if he is physically strong), [he should be acquitted]; for it is not likely, because it was going to seem likely. And similarly in other cases; for necessarily a person is either liable to be guilty or not liable to be guilty of the charge. Both alternatives appear likely, then, but one is likely, while the other is so not unconditionally but in the way mentioned. And this is "to make the weaker argument the stronger." Hence people were justly disgusted by Protagoras' declaration; for it consists in what is false, not true but apparently likely, and is included in no craft, but in rhetoric and contentious argument.

Enthymemes, both real and apparent, have now been spoken about.

2.25
Refutation

The next thing to be discussed, after what has already been said, is refutation.

It is possible to refute [an enthymeme] either by stating a counter deduction or by bringing an objection. And it is clear that it is possible to produce the stating of a counter-deduction on the basis of the same topics [as a deduction]; for the deductions are based on acceptable beliefs, and many things that seem to be so are contrary to one another. Objections, on the other hand, are brought, as also described in the *Topics*,[243] in four ways: based on itself, on what is similar, on what is contrary, or on what has been judged.

By "from itself" I mean, for example, if the enthymeme were about love as something excellent, the objection is in two ways; for it is possible to make a universal statement and say that all need is bad, or to make a particular one and say that there would be no talk of "Caunian love"[244] if there were not also bad sorts of love.

By from what is contrary: for example, if the enthymeme was that the good man does good to all his friends, [the objection is,] but not even the depraved one does evil to all of his.

Regarding what is similar: for example, if the enthymeme was that those to whom evil is done always hate, [the objection is,] but not even those to whom good is done always love.

243. A division similar to the one here is found at *APr.* 69b38–70a1, but no parallel division is found in the extant *Topics*, although a different fourfold division appears at 161a1–15.

244. A proverbial expression for forbidden love, of the sort between Byblis and her twin brother, Caunus.

The judgments are those of notable men: for example, if someone stated the enthymeme that one should be sympathetically considerate to those who are drunk, for their errors are made in ignorance. The objection is that then Pittacus does not have comprehension; for he would not have legislated greater punishments for someone who commits an error while drunk.

Enthymemes are stated on the basis of four things, and these four are likelihood, paradigm, proof, and sign. Those that are drawn from what either does or seems to hold for the most part are enthymemes based on likelihoods. Those that proceed through induction based on what is like, whether on one case or more than one, whenever a person by grasping the universal deduces the particular cases, are enthymemes through a paradigm. Those through what holds necessarily and always are enthymemes through a proof. And those, whether through a universal or a particular one, that something is so or is not so, are enthymemes through signs. And since this is so, and since what is likely holds not always but for the most part, it is evident that enthymemes of these sorts can be refuted by bringing objections, although the refutation may be an apparent one, and not always true;[245] for the objector does not refute that it is likely, but that it is not necessary. That is also why the defendant rather than the accuser always has the advantage, namely, through this fallacy; for since the accuser demonstrates through likelihoods, and since it is not the same thing to refute by proving that an argument is not likely as by proving that it is not necessary, what holds for the most part is always open to objection; for otherwise it would not hold for the most part, and would not be a likelihood, but would hold always and necessarily. And the judge thinks, when a refutation is made in this way, either that the thing is not likely or that it is not for him to judge, reasoning fallaciously, as we said (for he should not only judge on the basis of what is necessary, but also on the basis of likelihoods; for this is to judge in accord with "the best consideration"[246]). It is not enough, then, to refute by proving that it is not necessary; rather, one should refute by proving that it is not likely. And this will result if the objection rather holds for the most part. And an objection of this sort can be brought in two ways: either by the time or by the things at issue—but in the most controlling way, if by both; for if things are more often thus, this is more likely. **1403ᵃ1**

Both signs and enthymemes stated on the basis of a sign are refutable, even if the things hold, as was said in the first discussions;[247] for that every sign is non-deductive is clear to us from the *Analytics*.[248]

The refutation of enthymemes based on paradigms is the same as that of likelihoods; for if we have one case that is not so, there is a refutation, because the argument is not a necessity, even if more cases on more occasions are otherwise, but

245. Reading ἀεὶ.
246. 1375ᵃ29–30.
247. 1357ᵇ10–14, 17–21.
248. E.g., *APr.* 2.27.

if more cases or more occasions are that way,[249] we should contend that his present one is not like them, or not like them in the relevant way, or at least has some sort of difference.

Proofs and enthymemes based on proofs cannot be refuted as non-deductive (and this too is clear to us from the *Analytics*[250]), and what remains is to prove that the thing claimed does not hold. But if it is evident both that it holds and that there is a proof of it, the argument at once becomes irrefutable; for the demonstration becomes at once evident in all respects.

2.26
Amplifying and Diminishing; Refutative Enthymemes

Amplifying and diminishing are not elements of enthymemes; for I mean the same thing by "element" and "topic"; for an element or topic is something into the province of which many enthymemes fall. But amplifying and diminishing are related to proving that something is great or small, as to proving that it is good or bad, just or unjust, or anything else whatever. All these latter ones are things that deductions and enthymemes are about, so that if no one of these is a topic for enthymemes, neither is amplifying and diminishing.

Nor are refutative enthymemes some one form of enthymemes; for it is clear that one refutes by proving something or by bringing an objection. In the first case they prove the opposite in reply—for example, if he proved that something happened, the other proves that it did not, and if he proved that something did not happen, the other proves that it did. So this is not a difference (for they both use the same [topics]; for to prove that something is not the case or that it is the case, they bring in enthymemes). An objection is not an enthymeme either, but rather, as in the *Topics*, it is to state a belief on the basis of which it will be clear that [the opponent] has not [validly] deduced or that he has assumed something false.

But since there are three things that should be examined in a systematic way about a speech, let this much be said about paradigms, maxims, and enthymemes, and, in general, matters concerning the thought, and the bases on which we are well **1403b1** equipped with these and the ways we refute them. It remains to go through style and arrangement.[251]

249. Reading εἰ καὶ τὰ πλείω ἢ πλεονάκις ἄλλως, ἐὰν δὲ τὰ πλείω καὶ τὰ πλεονάκις οὕτω.

250. Again *APr.* 2.27.

251. This paragraph is repeated in an expanded form at the beginning of 3.1, suggesting that it may have been added to make a connection to a body of material on style and arrangement not intended to be part of the treatise as originally conceived.

BOOK 3

3.1
Style and Delivery

There are three things that should be systematically treated about a speech, first, what the means of persuasion will be based on; second, matters concerning style; and third, matters concerning how the parts of the speech should be arranged. The means of persuasion have already been spoken about and how many things they are based on, that they are based on three, and what sort these are, and why there are only these; for all judges are persuaded either because they themselves are affected in a certain way, or because they take the speakers to have certain qualities, or because something has been demonstrated. And enthymemes too have been spoken about, and the bases on which they should be supplied; for, on the one hand, there are special topics for enthymemes and, on the other, [general] topics. So the next thing to speak about is style; for it is not enough to have things one should say, but also necessary to have a way in which one should say them, and this contributes much to a speech's appearing to have a certain quality.

The first thing to be inquired about in accord with nature was precisely the one that naturally comes first: the basis on which the things at issue themselves have persuasiveness; second is the setting out of these by means of a certain style; and third of these is something the capacity of which is very great, but has not yet been systematically attacked, what has to do with delivery. For in fact delivery was late in making its way even into tragedy and comedy; for at first the poets themselves acted their tragedies. It is clear, then, that there is something of this sort in rhetoric too, as there is in poetics, which is precisely what some others have busied themselves about, among them Glaucon of Teos.

Delivery lies in the voice, and how it should be used in relation to each feeling (that is, sometimes loud, sometimes soft or intermediate), how the tones should be used (that is, high, low, or intermediate), and what rhythms to use in relation to each. For there are three things that such people investigate, which are volume, harmony, and rhythm. And these are pretty much those who win the rewards in competitions. And just as actors nowadays have greater capacity to do so than poets, so it is too in political debates, due to the depravity of the constitutions.

A craft concerned with delivery has not yet been contrived, since even one concerning style was late in emerging. And it seems to be something unrefined, when correctly considered. But since the whole study concerning rhetoric is related to **1404^{a}1** belief, one should pay the requisite attention to delivery, not because it is something correct, but because it is something compulsory, since the just thing, at any rate, is to seek nothing more in a speech than that it neither pain nor gladden; for it is just to contend by means of the things at issue themselves, so that other things, which are

outside the demonstration, are superfluous. Nevertheless, delivery's capacity is great, as has been said, because of the depravity of the listener.

Matters of style, however, are a small necessary part in all teaching; for to speak in one way rather than another does make some difference in relation to making things clear, although not so great a one; on the contrary, all this is appearance, and appeals to the listener, so no one teaches geometry this way.

Whenever style does come up it will do the same thing as the craft of delivery, and some people have tried to say a little about it—for example, Thrasymachus in his *Appeals to Pity*. But what concerns delivery is a natural thing, and largely outside the province of craft, while what concerns style is within the province of craft. That is why, again, those who are capable in it receive rewards, just as orators do for their delivery; for written speeches are stronger due to their style than due to their thought.

It was naturally the poets, then, who first got it going; for names are imitations, and the voice, the most imitative of all our parts, was there to start with. That is why the crafts of rhapsodizing, delivery, and of course others, were set up. And since the poets, though saying something foolish, seemed to acquire their reputation because of the style, a poetic style [of writing] first came about—for example, that of Gorgias. And even now the majority of the uneducated still think that such people discuss things in the most nobly beautiful way. This is not so, however, but rather the style characteristic of speech is distinct from that characteristic of poetry. This is made clear by what happened; for not even the tragic poets still use it in the same way, but just as they changed from tetrameters to iambic meter because, of all the various meters, it is most like [ordinary] speech, so they have also given up using names contrary to ordinary ways of speaking, and the ones with which the first poets ornamented their verses, and which the writers of hexameters still use even now. That is why it is ridiculous to imitate those who themselves no longer use style in that way.

So it is clear that we need not speak in an exact way about whatever matters have to do with style, but only those having to do with what we are discussing. The former is spoken about in the *Poetics*.[252]

3.2
Virtue of Style

Let the matters just discussed be regarded as theoretically grasped, and let virtue of a **1404b1** style be to be perspicuous (for speech is a sort of sign and if it does not make things clear it will not do its work), and neither low nor too elevated, but appropriate; for a poetic style, though presumably not low, is not appropriate for a speech.

In the case of nouns and verbs it is the prevalent ones that make a speech perspicuous, while the other names spoken about in the *Poetics* make it not low but

252. Chapters 20–22. Subsequent references are to these.

ornamented; for to deviate from them gives it an appearance of greater dignity; for people feel the same in relation to style as they do in relation to strangers and fellow citizens. That is why one should give one's ordinary way of speaking an air of unfamiliarity; for people find wondrous what is far away, and what is wondrous is pleasant.

In poetry of all sorts there are many ways of producing this effect, and they are fitting there; for the account is about things and people that are more out of the ordinary. But in prose speech they are much less so, since the subject matter is less so, and since even in poetry it would be inappropriate if a slave or a very young person were to use nobly beautiful language, or if it were used about very minor things.[253] But even in these cases what is appropriate is a matter of lowering or elevating. That is why doing it should be concealed, and one should not seem to speak in an artificial way but in a natural one; for the latter is persuasive, while the former is the contrary; for as with someone setting a trap for them, people resent it, just as they do spiked wines. An example is the effect of Theodorus' voice in comparison to that of other actors; for his seems to be that of the character speaking, while theirs seem alien to it. One conceals well if one composes one's speech by choosing from ordinary ways of speaking. This is precisely what Euripides does, and he first set the example.

A speech is composed of names and verbs, and the forms of names are those we got a theoretical grasp on in the *Poetics*, and of these, exotic names, double ones, and neologisms should be used rarely and on rare occasions (where, we will say later; the why has already been stated: it deviates from what is appropriate in the direction of excess). But what is prevalent, what is in proper form,[254] and metaphor are alone useful in the style characteristic of prose speeches. A sign of this is that these are the only ones that everyone uses; for everyone makes use of metaphors in addition to proper and prevalent words. So it is clear that if one composes a speech well, there will be an air of unfamiliarity to it, its composition will possibly be concealed, and it will be perspicuous. This, we said,[255] is the virtue of rhetorical speech. The sorts of names that are useful to a sophist, by contrast, are homonyms (for it is through these that he argues unfairly), and to a poet, synonyms. By words that are both "prevalent and synonymous" I mean, for example, "go" and "walk" (for these two are both prevalent and synonymous). **1405ᵃ1**

What each of these is, and how many forms of metaphor there are, and that its capacity both in poetry and in speeches is great, has been stated, as was said previously,[256] in the *Poetics*. But in a speech one should lavish more loving attention on them, inasmuch as a speech has fewer resources to assist it than verse. Perspicuity plus pleasantness plus an air of unfamiliarity are most of all possessed by metaphor, and [the use of] metaphor cannot be acquired from anyone else. But the epithets and metaphors

253. Kassel proposes a different structure of clauses but without impact on the meaning.
254. Neither lengthened nor shortened, but having the letters and syllables that properly belong to their prevalent forms.
255. 1404ᵇ1–5.
256. 1404ᵇ28.

used in speaking should be fitting. And this will be based on analogy—otherwise, it will be manifestly inappropriate, because contraries are most evident when set side by side. Instead, one should look to see what is appropriate to an old man as a red cloak is to a young one; for the same clothes are not appropriate to both. And if one wishes to honor, one should take one's metaphor from better things belonging in the same kind, and if to blame, from worse ones. I mean, for example, when the contraries are in the same kind, saying of the one who begs that he "prays," or of the one who prays that he "begs," because both are sorts of solicitation, is a case of doing this. As also is when Iphicrates called Callias a "begging priest" instead of a "torchbearer" and the latter replied that Iphicrates must be uninitiated into the Mysteries himself or he would not have called him a "begging priest" but a "torchbearer"; for both epithets have to do with a god, but one is a term of honor and the other of dishonor. And the one [who called actors] "flatterers of Dionysus," while they call themselves "artists."[257] These epithets are both metaphors, the first of which disparages, while the second does the contrary. Also, pirates call themselves "purveyors" nowadays—which is why one can say that the person who has done an injustice has "made an error," or that the one making an error has "done an injustice," and that a thief either "received" or "carried away." An expression like "holding sway over the oar and landing in Mysia" in Euripides' *Telephus* is inappropriate, because "holding sway" is more elevated than the worth [of what it refers to]— hence, no concealment.

There is an error in syllables too if they are not signs of pleasant voiced sounds. For example, Dionysius the Brazen in his elegies calls poetry "Calliope's screech," because both are voiced sounds; but the metaphor, by [using] meaningless voiced sounds, is bad.[258]

Further, metaphors should not be far-fetched, but rather should be transferred, in the form of names, from things that are of the same kind and same form to what is nameless, so that as soon as the name is uttered it is clear that it is of the same kind—as, for example, in the well-regarded riddle, "I saw a man gluing bronze onto a man using fire"; for the process is nameless, but both are a sort of application. Therefore, the author of the riddle called the application of the cupping instrument "gluing."[259] And, in general, from good riddles it is possible to get decent metaphors; for metaphors imply riddles, so that it is clear that the metaphorical transfer will be a good one.

257. Actors are taken to be devoted to the god Dionysus, as his flatterers by those who disparage them and as skilled in his service by the actors themselves.

258. A screech is a meaningless voiced sound, a poem a meaningful one, so they do not both belong to the same kind, as is required for a good metaphor.

259. The riddle is as follows: I saw a man gluing bronze onto a man using fire. What did I see? Answer: You saw a doctor cupping his patient with a bronze cup, heated in a fire, that draws out blood or other fluids as it cools.

And it should be from nobly beautiful things. And noble beauty in names, as Licymnius says, lies in the voiced sound or in the thing signified, and ugliness is the same way.

Further, and thirdly, there is what refutes the sophistical argument. But it is not, as Bryson said, that nobody uses shameful language if indeed the same thing is signified by saying this word instead of that; for this is false; for one may be more prevalent than another, more like the thing, or more properly belonging to it, by setting the thing at issue before the eyes. Further, this word may not have the same way of signifying as that one, so that on this ground too one must be posited as more nobly beautiful or more shameful than the other; for while both signify what is nobly beautiful or shameful, they do not do so insofar as it is nobly beautiful or insofar as it is shameful, or, if they both do so, one does it more and the other less.

These are the sources from which metaphors may be got: from the nobly beautiful either in regard to voiced sound or to capacity, or to sight or to some other sort of perception. It makes a difference, for example, whether one says "rosy-fingered dawn"[260] rather than "purple-fingered," or still worse, "red-fingered."

In the case of epithets too, the application is made from what is bad or shameful, for example, "mother-slayer," and from what is better, for example, "father-avenger."[261] And Simonides, when the winner in a mule-race offered him a small fee, was unwilling to produce [a celebratory ode], as being disgusted at producing one about "half-asses," but when the winner paid enough, he wrote: "Hail daughters of storm-footed mares."[262] And yet they were daughters of the asses too.

And, again, the same is true of the use of diminutives. The use of diminutives makes both the bad and the good less so, as Aristophanes jibes in the *Babylonians*,[263] when he uses "gold-let" instead of "gold," "cloak-let" instead of "cloak," "abuse-let" instead of "abuse," and "disease-let" instead of "disease."[264] But one should watch closely and carefully observe moderation in both [epithets and diminutives].

3.3
Frozen Effects and Inappropriate Metaphors

Frozen effects, on the other hand, come about in four ways with regard to style: First, in double names—for example, Lycophron's "many-faced heaven of the mighty-summited earth" and "narrow-passaged shore"; or like the name given by Gorgias, "oath-breaking

260. Often found in Homer.
261. The reference is to Orestes, who in killing Clytemnestra became at once a mother-slayer and a father-avenger.
262. Fr. 10 Page. Simonides focuses on their "bad" fathers in calling them "half-asses" and on their "good" mothers in calling them "daughters of storm-footed mares."
263. Fr. 90 Kock.
264. Reading καὶ ἀντὶ νοσήματος.

1406a1 and oath-keeping beggar-mused-flatterers";[265] or like Alcidamas' "his soul filled with wrath and his face growing flame-colored," and he thought their eagerness would be "end-accomplishing," he made the persuasion of his words "end-accomplishing," and the sea bed "indigo-blue." For all these appear poetic because of the doubling. This is one cause of frozenness.

Another one is the use of exotic names, as when Lycophron calls Xerxes a "*pelôron* [hugeous] man" and Sciron a "*sinis* [destroying] man,"[266] and Alcidamas of "*athurma* [toys] in poetry," "the *atasthalian* [wretchedness] of nature," and "*tethêgmenon* [whetted] with the unmixed anger of his thought."

A third lies in the use of epithets that are [too] long, or inopportune, or [too] frequent; for in poetry it is appropriate to say "white milk," but in a speech it is not only less appropriate, but also, if such things are used to excess, it puts it to the test and makes it plain that it is a poetic production. Epithets must of course be used to some extent (for they deviate from what is customary and give the style an air of unfamiliarity), but one should aim at moderation, since otherwise it does greater evil than speaking extemporaneously; for while the latter does not achieve the good, the former does achieve the bad.

That is why Alcidamas' epithets appear frozen; for he uses epithets not as seasonings but as the main course, so frequent, long, and conspicuous are they. For example: not "sweat" but "the moist sweat"; not "to the Isthmian games" but "to the festal assembly of the Isthmian games"; not "laws" but "laws, the kings of cities"; not "by running" but "by a running impulse of the soul"; not "a school of the Muses" but "a school of the Muses inherited from nature"; and "the melancholic meditation of his soul"; the craftsman not of "favor" but of "all-popular favor"; and "household steward of the listeners' pleasure"; and concealed not with "boughs" but with "boughs of wood"; and not he covered his body but "his body's shame"; and "closely imitating (*antimimon*) the soul's appetite (*epithumian*)" (this is at the same time using a double name and an epithet, so the result is a poetic production); and "so extravagant an excess of depravity." That is why, by speaking poetically, people produce, because of inappropriateness, something ridiculous and frozen, and, because of babbling, something lacking in perspicuousness; for when a speaker heaps words on someone who already knows, he dissolves the perspicuousness by casting a shadow over it.

People use the double names when something is nameless and the word is easily put together, as in "pastime (*to chronotribein*)." But if it is overdone, it becomes an entirely poetic production. That is why a style using double names is most useful to
1406b1 dithyrambic poets (for they are noisy); exotic names to epic poets (for the style is

265. B15 DK.

266. *Pelôros* is an archaic—and so in the relevant sense exotic—name, meaning something huge and, hence, appropriate for a monster (*pelôr*). Both Sciron and Sinis were famous robbers. *Sinis* is also an exotic word meaning "destroying."

dignified and self-secure); and metaphor to iambic poets (for they [tragic poets] now use iambics, as was said[267]).

And further, a fourth sort of frozen effect is found in metaphors; for there are also inappropriate metaphors, some because they are ridiculous (for comic poets use metaphors too), some because they are overly dignified and tragic. And, if far-fetched, they lack perspicuousness. For example, Gorgias' "things green and bloodless," or "you have shamefully sown and badly reaped";[268] for these are overly poetic. And as Alcidamas called philosophy "a fortress to the laws,"[269] and the *Odyssey* "a beautiful mirror of human life" and "introducing no such toys to poetry" (for all these are unpersuasive because of what was stated). As for what Gorgias said to the swallow, when she flew down and let fall her droppings on him, it was in the best of tragic styles, since he said, "Shame on you, Philomela." For, though shameful for a maiden, if a bird did it, it was not shameful. He well rebuked her by calling her what she was, then, but not what she is.[270]

3.4
Similes and Metaphors

A simile is also a metaphor; for the difference is small; for when the poet says [of Achilles], "He rushed on like a lion,"[271] it is a simile, when "A lion, he rushed on," it is a metaphor; for because both are courageous, he used a metaphor and called Achilles "a lion"). The simile is useful in a speech too, but on occasion; for it is poetic. And similes are to be got in just the way metaphors are; for they are metaphors, but differing in the way they are stated.

Examples of similes: What Androtion said about Idreus, that he was "similar to mongrels let off the chain"; for as they run to bite, so Idreus, let off his chains, was dangerous. And Theodamus likened Archidamus to a "Euxenus without a scientific knowledge of geometry" (this is by analogy; for Euxenus will then be a geometry-knowing Archidamus). And the one in Plato's *Republic*, that those who strip the dead [of their weapons] are like mongrels who bite at stones but do not attack the throwers;[272] or the one applied to the people, that it is similar to a ship owner who is strong but deaf;[273] or the one applied to the verses of the poets, that they are like those

267. 1404ᵃ29–31. Reading ἡ μεταφορὰ . . . εἴρηται.
268. B16 DK.
269. It is unclear whether philosophy is a fortress (*epiteichisma*) against the laws or a fortress in defense of them.
270. A23 DK. Philomela was transformed into a swallow. By metaphorically transferring her name to an ordinary swallow, Gorgias offends again perspicuousness, since what he says is false of an ordinary swallow, though true of a maiden.
271. Homer, *Iliad* 22.164.
272. 469d–e.
273. 488a–b.

who are in bloom but lack beauty;[274] for when the latter have finished blooming and the former are dissolved into their elements they do not appear the same. And the
1407ᵃ1 one of Pericles about the Samians, that they are like children who take the sop but go on crying;[275] or about the Boeotians, that they are like holm oaks; for the latter are felled by holm oaks, and the Boeotians by fighting each other.[276] And Demosthenes'
5 one about the people, that they are similar to those who get seasick on ships. And the way Democritus likened orators to nurses who swallow the baby's sop and rub his
10 lips with the spit. And the way Antisthenes likened the thin Cephisodotus to incense, because he gives pleasure by wasting away.

All these can be stated either as similes or as metaphors, so it is clear that whichever ones are popular when stated as metaphors will also be similes, and similes are metaphors in need of a ratio. And a metaphor based on an analogy should always
15 be reciprocally applicable to either of the two things of the same kind—for example, if a wine-saucer is the shield of Dionysus, the shield can be fittingly said to be the wine-saucer of Ares.[277]

A speech, then, is composed of these things.

3.5
The Constituents of Good Greek Style

The starting-point of style, however, is to speak correct Greek. This consists in five
20 things: First, the use of connectives, which should be introduced in the natural order of coming before or after each other that some of them require—for example, as *ho men* and *ho egô men* require *de* and *ho de*.[278] And they should be correlatively introduced while the listeners still remember the correlation, and the two should neither be too far apart, nor should [another] connective be introduced before the
25 connective that is necessary; for this is rarely appropriate: "But I, on the one hand (*men*), since (*epei*) he spoke to me, for Cleon came begging and (*te kai*) praying, set out, taking them with me."[279] In cases like this, many connectives are thrown in

274. 601b.
275. Samos was conquered by the Athenians in 440 BC. The sop the Samians received was the establishment there of a democracy instead of an oligarchy.
276. The wood of the holm oak (*Quercus ilex*) is hard and tough and was used in making plow beams and other tools, such as axes, which were then used to cut down other holm oaks.
277. A wine-saucer (*phialê*) is a broad, flat bowl or cup, used for pouring libations and drinking, whose shape makes it like a shield.
278. *Men* ("on the one hand") requires an answering *de* ("on the other hand"). *Egô men* ("I on the one hand") implies a contrast with someone else (*ho de*) on the other.
279. The *men* calls for an answering *de*, which is expected (though it does not appear in the text), with *epei* and *te kai* intervening.

before the correlative one is introduced, and if what is intermediate is too long, it lacks perspicuousness.

In one case, then, good style consists in the use of connectives, while in a second it consists in calling things by their special names and not by encompassing ones.[280]

A third is not to use ambiguities, unless by using them, you deliberately choose to achieve the contrary effect,[281] which is precisely what people do when they have nothing to say, yet pretend to say something; for such people say it in verse, just as Empedocles does; for by much going around in circles it tricks the listeners, and they feel precisely the way that many do about oracles; for when oracles speak ambiguously, they also assent: "Croesus, by crossing the Halys, will dissolve a great empire."[282] And because there is generally less chance of an error, oracles speak of the thing at issue in general terms; for in a game of odd-or-even[283] one is more likely to win by saying "odd" or "even" rather than how many it is, or that "it will be" rather than when, which is why soothsayers never add the when. All these things, then, are alike, and so—except for the sake of the sort of thing we mentioned—should be avoided.

A fourth is to follow Protagoras' division of the kinds of names into masculine, feminine, and neuter; for these too should be introduced correctly: "She (*hê*), having come (*elthousa*) and having spoken (*dialechtheisa*), went away."[284]

A fifth consists in the correct naming of plural and singular: "They, having come, beat me (*hoi d'elthontes etupton me*)."[285]

In general, what is written should be easy to read and easy to speak, which is the same thing. This quality is precisely what the many connectives do not possess, nor the writings that are not easy to punctuate—for example, those of Heraclitus. For to punctuate Heraclitus' writings takes work because it is unclear what word goes with what, the preceding one or the following one; for example, at the start of his written composition he says: "Of this *logos*' being forever do human beings prove to be uncomprehending."[286] For it is unclear which of the two the "forever" goes with.[287] Further, the following produces solecism: not introducing, when you join words, what is appropriate for both—for example, if [you are introducing] sound and color

280. If N_1 is a name special to X, and N_2 is a name that encompasses X (or applies to X and to other things), use N_1 rather than N_2.

281. I.e., obscurity.

282. Croesus took it to mean that he would dissolve the Persian empire; in fact, the empire he dissolved was his own.

283. One player held a certain number of counters hidden in his hand. His opponent had to guess how many they were, or whether the number was odd or even.

284. Participles (*elthousa*, *dialechtheisa*) have genders which here, in agreement with *hê*, are feminine.

285. *Hoi*: masculine plural; *elthontes*: masculine participle agreeing with *hoi*; *etupton*: third-person plural, again agreeing with *hoi*; *me*: accusative singular.

286. B1 DK.

287. Is it of the *logos'* being forever that human beings prove uncomprehending, or is it of the *logos'* being that they prove forever uncomprehending?

"seeing" is not common, while "perceiving" is common. And lack of perspicuousness results if you do not present your thesis beforehand, if you are going to throw in many things in the middle—for example, "I was in fact, after speaking to that man, going blah, blah, blah, to go for a walk," instead of "I was in fact going, after speaking, to go for a walk, then blah, blah, blah happened."

3.6
The Weight of a Style

To the weight of a style, the following things contribute: Using the account instead of the name—for example, not "circle" but "a plane figure that extends equally from the center." To concision, doing the contrary: the name instead of the account. And if something is shameful or inappropriate, if what is shameful is in the account, using the name in speaking, but if it is in the name, using the account. Making things clear by means of metaphors and epithets, while guarding against the poetic. Making the singular plural, precisely as the poets do. They say, though there is only one harbor, "to the Achaean harbors,"[288] and "here are my tablet's many-leaved folds."[289] Not joining two names [under one article], but introducing a single one for each—for example, "the woman, the one that is mine"—and, when speaking concisely, doing the contrary: "the woman of mine." Speaking with a conjunction, and, if speaking concisely, doing the contrary, although without ungrammatical asyndeton—for
1408a1 example, "having walked over and having spoken" and "having walked over, I spoke." The practice of Antimachus is also useful, speaking on the basis of what the thing does not possess, as he does in the case of Teumessos: "There is a windy little hill. . . ."[290] Amplification of this sort can go on without limit. And it is available in the case of good things and bad things that are not possessed, whichever is useful. It is from this too that the poets get names, such as, "string-less and lyre-less music," since they introduce them based on the privations; for this is popular when using proportional metaphors in speaking—for example, saying that the trumpet is "lyre-less music."

3.7
Appropriateness

The style will have appropriateness if it expresses feeling as well as character and is proportional to the underlying things at issue. And it is proportional if it neither

288. F83 Nauck. Source unknown.

289. Euripides, *Iphigenia in Taurus* 727. Iphigenia is referring to her letter, made up of joined leaves—literally, "doors (*thurai*)"—of wood coated with wax.

290. The beginning of a passage from the *Thebais*, which continues to praise the hill by enumerating all the good qualities that do *not* belong to it.

speaks off-handedly about weighty things nor in a dignified way about worthless ones, and if no ornamental epithet is attached to a worthless name. Otherwise, it has the appearance of comedy, like what Cleophon produces; for some of the things he said were like saying "Milady fig (*potnia sukê*)."[291]

Style [appropriately] expresses feeling if, in case of wanton aggression, it is that of an angry person; if, in case of impious or shameful things, it is that of one who is disgusted and reluctant even to speak of them; if, in case of praiseworthy things, admiringly; but if they are pitiable, in a lowly way; and similarly in the other cases. And the proper style too makes the thing at issue persuasive; for the soul draws a false inference as to the truthfulness of the speaker, because, in the case of such things, they are in such a condition that, even if the things at issue are not as the speaker says, they think they are that way. In fact, the listeners always share the feelings of a speaker who speaks with [appropriate] feeling, even if he says nothing. That is why many speakers overwhelm their listeners by shouting.

The sort of proof that is based on signs is also expressive of character, when what is appropriate to each kind and state [of character] follows along with it. By "kind" I mean in accord with stage of life (for example, boy, man, old man), woman or man, Spartan or Thessalian; by "states" I mean the things in accord with which someone is of a certain sort in life; for lives are not of the same sort in accord with every state. If, then, a person speaks using names that also properly belong to a state, he will convey the [relevant] character; for a boorish and a well-educated person would not say the same things or would not say them in the same way.

Listeners' feelings are also affected by expressions that professional speechwriters use immoderately: "who does not know?" "everybody knows"; for a listener agrees out of shame, in order to share in the very thing all the others also do.

Opportune or inopportune use is common to all the forms. And a cure for every excess is the oft-repeated one: the speaker himself should criticize himself beforehand; for something seems true when even the one making the speech does not conceal what he is doing. Further, not using all the proportionalities at the same time; for this way the listener[292] is deceived. I mean, for example, if the names are harsh, the voice, countenance, and the other appropriate things[293] should not also be harsh. Otherwise, what each of them is becomes evident.[294] But if one is used, but not another, the speaker does the same thing, but escapes notice. But if, then, gentle things are said [too] harshly and harsh things [too] gently, it becomes unpersuasive.

Double names, a number of epithets, and especially unfamiliar names are fitting for anyone speaking in a way expressive of feeling; for sympathetic consideration is

291. *Potnia* is a poetic title of honor, used chiefly in addressing females, whether divine or human. A *sukê* is a fig tree, the fruit of which is a *sukon*, which is a vulgar name for a woman's (or a man's) genitals.

292. Reading ὁ ἀκροατής.

293. Reading καὶ τοῖς.

294. Reading ἕκαστον ὅ ἐστιν.

shown to an angry person when saying that an evil is "cosmic-sized" or "gargantuan." And they are also appropriate when the speaker already has hold of the listeners and, by his [words of] praise or blame, anger or love, has produced ecstasies of feeling in them, as Isocrates does at the end of the *Panegyricus*: "fame and name . . ." and "in that they endured . . ."; for people do utter such things when they are in an ecstasy of feeling, so that the listeners, being themselves in a similar condition, are clearly receptive of them. That is why these things are also fitting for poetry; for poetry is god-inspired. They should be used, then, in the way described, or with self-deprecation, as Gorgias did, or as in the *Phaedrus*.[295]

3.8
The Scheme or Rhythm of a Style

The scheme of the style should be neither metrical nor rhythmless; for the former is unpersuasive (for it seems fabricated), and at the same time also diverts attention; for it makes the listener attend to the similar cadence and when it will occur again—just as children anticipate the answer to the herald's, "Whom does the emancipated slave choose as his sponsor?" with "Cleon!"[296] But what is rhythmless is unlimited, while a speech should be limited, although not by meter; for what is unlimited is displeasing and unknowable. All things are limited by number. And the number of the scheme of a style is a rhythm, of which the meters are segments.[297] That is why a speech should have rhythm, but not meter; for then it will be a poem. But its rhythm should not be exactly implemented; and this will be if it is rhythmical only up to a point.

Among the rhythms, the heroic[298] is dignified, but deficient in the harmony suited to speaking.[299] The iambic is the very style of ordinary people (which is why of all the meters it is most used in speaking), while style [in a speech] needs to be dignified and removed from common usage. The trochaic is too much like comic dancing, as is clear from [trochaic] tetrameters; for tetrameter is a dancing rhythm. What remains is the paean, which came into use starting with Thrasymachus, although he and his followers could not state what it was. The paean is a third rhythm,[300] closely connected to those already mentioned; for it has the ratio three to two, while the

295. 234d, 241e.
296. By law an emancipated slave could not plead his own case in court; he needed a citizen sponsor to do it on his behalf. Cleon evidently played this role very often.
297. Reading τμήματα.
298. I.e., dactylic hexameter.
299. Reading σεμνὸς καὶ λεκτικῆς ἁρμονίας δεόμενος.
300. Though the paean is actually the fourth meter mentioned, it represents the third alternative regarding ratio, since iambus and trochee involve the same ratio.

others are one to one or two to one. And one-and-a-half is closely connected to these, and this is what the paean is.[301]

The other rhythms should be avoided because of what we mentioned and because they are metrical, while the paean should be adopted; for it alone of the rhythms mentioned is not a meter, so that it most of all escapes notice. As things stand, however, only one sort of paean is used, both at the start and at the end. But the start should differ from the end. There are two forms of paean that are opposite to each other, of which one is appropriate as a start (as it is in fact used). This is the one that starts with a long syllable, and ends with three short ones: *Dālŏgĕnĕs eite Lukian* ("Delos-born or Lycian") and *khrūsĕŏkŏma Hekate pai Dios* ("golden-haired Archer, son of Zeus"). The other is the contrary, where three short ones start, and a long ends: *mĕtă dĕ gān hŭdată t' ŏkĕănŏn ĕphănĭsĕ nūx* ("After earth and waters, night obscured ocean").[302] This produces an ending; for a short syllable, because of its incompleteness, produces something docked. Instead it should be brought to an abrupt close with a long syllable, and the end clearly marked, not by the scribe nor by a marginal mark,[303] but by the rhythm.

That the style, then, should be rhythmical, not un-rhythmical, and what rhythms make it rhythmical and how they do so, has been stated.

3.9
Continuous versus Compact Style

The style is necessarily either continuous and united by connective, like the preludes in dithyrambs, or compact and like the antistrophes of the ancient poets.

The continuous style is the ancient one; for previously all used it, but nowadays not many do. By "continuous" I mean one that has no intrinsic end, except by the discussion of the thing at issue having been completed. It is displeasing because it is unlimited; for all wish to have the end in view. That is why runners lose their breath and relax when they reach the end; for they do not flag before that because of seeing the limit-point ahead of them. This, then, is the continuous style.

The compact style, by contrast, is the one in periods. And by a "period" I mean a style having an intrinsic starting-point and end-point, and a magnitude easily surveyed as a whole. This is pleasing and easily learned. It is pleasing, because it **1409b1** is contrary to the unlimited one and because the listener always thinks he has got hold of something for himself for at every moment something completed is given to him, while neither to foresee nor get to an end is displeasing. And it is easily learned

301. One and a half is the ratio 3:2, which is the mean ratio between 1:1 (heroic) and 1:2 (iambus) or 2:1 (trochee).

302. All three are attributed to Simonides.

303. In Aristotle's time, written punctuation marks were undeveloped. A mark was added in the margin to indicate, for instance, the change of speaker in a dialog.

because it is easily remembered, and this is so because a periodic style has a number, which is the most easily remembered thing of all. That is why everyone remembers things in verse better than those in prose; for it has a number by which it is measured. And the period should also be completed in thought and not broken off, as in the iambic line: "Calydon is this land, of Pelops' soil . . .";[304] for the division makes it possible to suppose the contrary, as in the case we mentioned, that Calydon is in the Peloponnese.

A period is either divided into clauses or smooth. A style consisting in clauses is completed, divided, and easily uttered in a breath, not by means of [arbitrary] division, but as a whole. A clause is one of the two parts of this. I call a period "smooth" when it has only one clause. And both clauses and periods should be neither truncated nor too long; for a short one often jolts the listener; for when he is still being impelled onward by the measure that he has a defining mark of within himself, if he is pulled up short by the speaker's pausing, he is necessarily made to stumble, as it were, due to the abrupt pause. Those, on the other hand, that are too long make him feel left behind, like walkers who go past the turning-point; for they too leave behind their fellow walkers.[305] Similarly, periods that are too long become a [whole] speech that is like a rambling [dithyrambic] prelude. The result is what Democritus of Chios jibed at in Melanippides, who instead of antistrophes composed [dithyrambic] preludes:

> A man does bad things to himself in doing bad things to another;
> A long dithyrambic prelude does the worst to the composer himself;[306]

for the same applies to those who speak in long clauses. But those that are too short do not turn into a period; thus they drag the listener stumbling along.

A style consisting in clauses is either divided or opposed. An example of a divided one is "I have often admired those who organized assemblies and established athletic contests."[307] It is opposed when in each clause contrary is brought into relation with contrary or when the same [word] is yoked together with the contraries. For example: "They profited both, both those who stayed and those who followed; the latter, for they provided them more than they had at home, and the former, for they left enough behind"—the contraries are staying and following, enough and more.[308] "So both to those needing [to get] things and those wishing to indulge in them . . ." —indulging in and getting are contraries.[309] And further: "It often happens in these circumstances that the practically wise fail and the foolish succeed"; "They were straightaway

304. The opening line of Euripides' *Meleager*.
305. Reading ἀπολείπουσι . . . συμπεριπατοῦντας.
306. A parody of Hesiod, *Works and Days* 265.
307. The opening of Isocrates, *Panegyricus*.
308. *Panegyricus* 35.
309. *Panegyricus* 41.

thought worthy of the prizes of valor, and not much later they took the command of the sea"; "To sail through the land and march through the sea, bridging the Hellespont and digging through Athos"; "And though citizens by nature, by law deprived of the city"; "For though some of them miserably perished, others were shamefully saved"; "Privately using [only] barbarians as household slaves, while communally overlooking their many enslaved allies"; "Either to possess when alive or to bequeath when dead."[310] Also, what someone said against Peitholaus and Lycophron in court: "And these men, though they used to sell you when they were at home, have come to you here to buy you off." For all these do what has been said. And such a style is pleasing, because contraries are better known, and are known more clearly when side by side, and because they are like deductions; for refutation consists in a bringing together of opposites.

Antithesis, then, is of this sort. Equalization (*parisôsis*) is if the clauses are equal [in the number of syllables], and unison (*paromoiôsis*), if each of the two clauses has a similar extremity; but it must have this either at the start or at the end. And at the start it is always found in [similar] names, while at the end it may be found in the last syllable, the inflection of the same name, or the same name. At the start in such cases as: *Agron gar elaben argon par' autou* ("A field he took from him, a fallow field"),[311] and *Dôrêtoi t' epelonto pararrêtoi t' epeessin* ("They were ready to accept gifts and to be persuaded by words").[312] At the end: *Ô[i]êthês an auton ou paidion tetokenai, all' auton paidion gegonenai* ("You would have thought him not to have begotten a child, but to have become a child himself"),[313] and *En pleistais de phrontisi kai en elachistais elpisin* ("In the midst of the greatest cares and smallest hopes"). Inflexions of the same name: *Axios de stathênai chalkous, ouk axios ôn chalkou* ("Worthy of a bronze statue, but not worthy of a bronze coin"). The same name: *Su d' auton kai zônta eleges kakôs kai nun grapheis kakôs* ("When he was alive you spoke badly about him and now you write badly"). The same syllable: *Ti an epathes deinon, ei andr' eides argon*? ("What terrible thing would you have suffered, if you had seen an idle man?") And it is possible for the same clause to have all these at the same time, namely, for the same one to be a case of antithesis, equalization, and similarity of ending. **1410^{b}1**

The starts of periods have been pretty much enumerated in the *Theodectea*. And there are also false antitheses—for example, the one Epicharmus wrote: *Toka men en tênôn egôn ên, toka de para tênois egô* ("At one time I was in their house, at another I was with them.")[314]

310. *Panegyricus* 48, 72, 89, 105, 149, 181, 186.
311. Aristophanes, Fr. 649 Kock.
312. Homer, *Iliad* 9.526.
313. The source of this and the other unattributed quotations that follow is unknown.
314. Fr. 147 Kaibel.

3.10
The Sources of Elegant and Popular Expressions

Since determinations have been made about these things, we must next state the sources of elegant and popular expressions. Well, to produce them is a matter for natural cleverness or training; to explain them, on the other hand, is a matter for this methodical inquiry. Let us say what they are, then, and enumerate them completely, and let the following be for us a starting-point.

To learn easily is in fact by nature pleasant to everyone, and names signify something, so whichever names produce learning in us are pleasantest. Exotic names are unknown, and prevalent ones we [already] know, but metaphor is especially good at producing learning; for when someone says that old age is "stubble,"[315] he produces learning and knowledge through the kind; for both old age and stubble are [in the kind of] things that have finished blooming. The similes of the poets also do the same thing. That is why, if they do it well, they appear elegant. For a simile, as was said earlier,[316] is a metaphor differing in how it is presented. That is why it is less pleasing, because it is longer, and because it does not say that this is that, and so the [listener's] soul does not inquire about it.

Necessarily, then, both in style and in enthymemes, the ones that are elegant are those that produce rapid learning in us. That is why superficial enthymemes are not popular (by "superficial" I mean those that are entirely clear and there is no need to inquire about), and neither are those that are unknown when stated. Instead, the ones that are popular are those of which there is knowledge at the same time as they are stated (even if it did not exist previously), or the thought is apprehended a little later; for then some sort of learning takes place, in the other case neither [sort of learning] takes place. In terms of the thought belonging to what is spoken, then, enthymemes of this sort are popular. In terms of the style, on the other hand, an enthymeme is popular because of its scheme, if it is expressed in an oppositional way (for example, "Considering that the peace common to the others was a war against their own private interests" [317]—where peace is opposed to war), and because of names, if these contain a metaphor, provided it is neither strange (for then it is difficult to comprehend) nor superficial (for then it makes no impression). Further, [it is popular] because of setting things before the eyes; for things should be seen as being done rather than as being in prospect. One should therefore aim at these three things: metaphor, antithesis, activity.

1411a1 Among the four sorts of metaphor, the most popular are those by analogy, as when Pericles said[318] that the youth killed in the war vanished from the city as if the spring

315. Homer, *Odyssey* 14.214.
316. 1406b20–22.
317. Isocrates, *Philippus* 73.
318. 1365a31–33.

had been taken from the year. Leptines,[319] speaking about the Spartans, said that he would not allow [the Athenians] to look on while Greece "became one-eyed." And when Chares was eager to have his accounts for the Olynthian war inspected, Cephisodotus indignantly exclaimed that he was trying to have his accounts inspected while "squeezing the people's throat." And once, exhorting the Athenians, he said that they should march out to Euboea, and there provide themselves with supplies "by the decree of Miltiades."[320]

When the Athenians had made a truce with the Epidaurus and the neighboring coasts, Iphicrates, indignant, said that "they had stripped themselves of travel provisions for the war."[321] Peitholaus called the Paralian "the people's bludgeon" and Sestus "the corn seller's board of the Piraeus." Pericles urged the removal of Aegina, "the eyesore of the Piraeus."

Moerocles said that he was no more wicked than X (naming one of the decent people); for that person was wicked at thirty-three and a third percent interest, he himself at ten. Anaxandrides' iambic line about the daughters who were slow in marrying: "The maidens, I find, are past their marriages' due date."[322] That of Polyeuctus to a certain Speusippus, who was a paralytic, that he could not keep quiet, though "shackled by luck in a five-holed pillory of disease."[323] Cephisodotus called triremes "multi-colored millstones," and the Cynic called taverns the "communal messes of Attica."

Aesion said that the Athenians had "drained" their city into Sicily; for this is a metaphor and sets things before the eyes.[324] And his "So Greece cried aloud" is also, in a way, a metaphor and sets things before the eyes. Cephisodotus urged the Athenians not to hold their "race meetings" too often. And Isocrates spoke of those who "race together" in the general assemblies. And the example in the funeral oration, that "it is fitting for Greece to cut off her hair [in mourning] beside the tomb of those who died at Salamis, since together with their virtue freedom was buried";[325] for if the speaker had said that it was proper to shed tears since their virtue was being buried together with them, it would have been a metaphor and set things before the eyes, but "with virtue freedom" involves a certain antithesis.[326]

319. Sparta is one of the eyes, Athens the other.
320. Issued at the time of the Persian invasion of 390 BC, proverbial for the speed with which it was carried out.
321. Against Sparta, in which Iphicrates scored a significant victory in 390 BC. Epidaurus, which prior to the truce had been allied with Sparta, could easily have been plundered by the Athenian navy to provide provisions.
322. Fr. 68 Kock.
323. The head went in one hole, the hands and feet in the other four.
324. The Athenian forces sent to invade Sicily in 415–413 BC were so enormous that they left scarcely anyone behind in Athens.
325. Lysias 2.60. The original refers to the battle of Aegospotami (405 BC), in which the Spartans defeated the Athenians, not Salamis (480 BC), in which the Greeks defeated the Persians.
326. The antithesis is not between freedom and virtue but between freedom and buried.

1411ᵇ1 And when Iphicrates said "the route of my words is through the middle of Chares' actions," it was a metaphor by analogy, and "through the middle of" sets things before the eyes. To say "summoning dangers to help with dangers"[327] is a setting before the eyes and a metaphor. Lycoleon said in defense of Chabrias, "They did not even feel shame before his supplicant—the bronze statue [over there]"; for this was a metaphor at that time, but not at all time, although it set things before the eyes; for when Chabrias was in danger, the statue—the inanimate yet animate memorial of his works for the city—supplicated.

And "in every way practicing smallness of thought"; for to practice is to increase something.[328] That "the god kindled the understanding as a light in the soul"; for both understanding and light make something clear.[329] "For we are not putting an end to our wars, but rather postponing them";[330] for both postponing and a peace of this sort are future things. That "treaties are a much nobler trophy than those that come about in wars; for the latter concern small gains and a single stroke of luck, while treaties concern the whole war"; for both treaties and trophies are signs of victory.[331] And that "cities pay a heavy inspection-based fine with the blame of people"; for an inspection-based fine is a sort of legal blame.[332]

That elegant expressions are based on metaphors by analogy, then, and on setting things before the eyes has been stated.

3.11
Setting Things before the Eyes

We must now state what we mean by setting things before the eyes and what must be done for this to come about. I mean, then, that things are set before the eyes by whatever signifies them being active—for example, to say that a good man is "foursquare"[333] is a metaphor (for both are complete things), but it does not signify activity, while "having his prime of life in full bloom"[334] does signify activity, as does

327. Author unknown. The metaphor lies in the transfer of "summoning" from people to impersonal dangers.
328. Isocrates, *Panegyricus* 151. The subject's smallness of soul may have been increasing, but he was not practicing it with that end in view. Thus as increasing is to X so practicing is to smallness of soul.
329. Source unknown.
330. Isocrates, *Panegyricus* 172.
331. Based on Isocrates, *Panegyricus* 180.
332. The metaphor transfers "inspection" from its proper legal setting to a more general non-legal one.
333. Simonides Fr. 37 Page.
334. Isocrates, *Philippus* 10.

"you, like a sacred animal roaming at will"[335] and "thereupon, the Greeks darting forward with their feet."[336] "Darting" signifies activity and is a metaphor; for it means "quickly." And Homer often used setting before the eyes so as to make inanimate things animate through metaphor. But in all of them it is by producing activity that he wins popularity, as, for example, in the following: "Downward again to the plain rolled the ruthless stone," and, "the arrow flew," and, "[the arrow] was eager to fly," and, "[the spears] stuck in the ground, still longing to take their fill of flesh," and, **1412ᵃ1** "the spear-point sped eagerly through his breast."[337] In all of these, because the things are [signified as] animate, there is an appearance of their being active; for "being ruthless," "longing," and the others signify activity. And these he has applied to the things through a metaphor by analogy; for as the stone is to Sisyphus, so is the shameless person to the one shamefully treated.

Homer does the same to inanimate things in his most popular similes as well: "Arched, foam-crested, in ranks, one upon another."[338] He makes everything into something that moves and lives, and activity is movement.

Metaphors, as was said earlier,[339] should be drawn from things that are closely related but not manifestly so—as even in philosophy getting a theoretical grasp on the resemblances in things that are very far apart is a matter of good guesswork. So it was that Archytas said that arbitrator and altar are the same thing; for it is to them both that someone who has suffered an injustice flees. Or if someone were to say that an anchor and a pothook are the same; for they are the same thing, but they differ with respect to the above and the below. And the "re-equalization" of cities[340] [signifies] the same thing in cases that are very far apart—the equality is in surface area and in [political] capacity.

In most cases elegant expressions are due to metaphors and to accompanying deception; for it becomes more clear to the listener that he has learned something new when this is contrary [to what he expected], and his soul seems to say "how true, and I was in error." And the elegance of epigrams also comes from their not meaning what they say—for example, the one of Steisichorus, that "their cicadas will sing to themselves from the ground."[341]

And good riddles are pleasing due to the same thing; for learning is involved and they are said by means of a metaphor. As too are what Theodorus calls "novel expressions." But this effect comes about when there is something unacceptable, and

335. *Philippus* 127. Flocks of sacred animals were allowed to roam freely within temple precincts. Isocrates is representing Phillip as such an animal, with the whole of Greece as his precinct.
336. Euripides, *Iphigenia in Aulis* 80.
337. Homer, *Odyssey* 11.598, *Iliad* 13.587, 4.126, 11.574, 15.542.
338. *Iliad* 13.799.
339. 1405ᵃ35–37, 1410ᵇ31–33.
340. Perhaps a reference to Isocrates, *Philippus* 40.
341. 1395ᵃ2.

not, as he says, something in accord with previous belief; instead, it is like the plays on words in jokes.

Jibes involving a change of letter have precisely this effect; for they involve deception. It also occurs in verse; for things may not be as the listener expected: "He strode along, having on his feet—*chilblains*!"; the listener was expecting "sandals."[342] And it should be clear as soon as it is uttered. Those involving a change of letter make the speaker mean not what he says, but what he twists the name to mean—for example, Theodorus saying to Nikon the lyre player, *thrattei*;[343] for he pretends to mean *thrattei se* and deceives us; for he means something else. That is why it is pleasing to the one who learns it, since if the listener does not know that Theodorus is a Thracian, it will not seem elegant. Also, *boulei auton persai*.[344] But both must be said in the way that is fitting.

Likewise too with elegant expressions. For example, saying that the *archê* of the sea was not the *archê* of the evils for the Athenians;[345] for they profited from it. Or—as Isocrates said[346]—the *archê* was for the city the *archê* of the evils. For in both cases what one would not think anyone would say is what is said and is recognized as true; for to say that an *archê* is an *archê* is to say nothing clever, but Isocrates does not mean it that way, but rather in another way, and he denies *archê* not in the sense he has spoken of it, but in another one.

In all these cases, if the name is introduced in a fitting way, whether by homonymy or metaphor, it is done well. For example, "*Anaschetos ouk anaschetos*";[347] the denial is by homonymy, but is used fittingly, if he is displeasing. Also, "do not make yourself more *xenos* than a *xenos*," or not more than you should be.[348] And the same with, "a *xenos* should not always be *xenos*";[349] for this too means something foreign [to what it says]. And the same with the much-praised line of Anaxandrides, "It is noble to die before doing anything that deserves death";[350] for this is the same as saying that someone deserves to die who does not deserve to die, or that someone deserves to die who does not deserve death, or who has done nothing that deserves death. The form of the style is the same in these cases, but the briefer and more oppositional the style,

342. Source unknown. The rhyme led the listener to expect *pedila* ("sandals"), the author substituted *chimethla* ("chilblains").
343. Reading θράττει. Theodorus says "you are a lyre strummer," or "you are confounded," but means "you are a Thracian strumpet or female slave."
344. The verb *mêdizein* ("Medize") means "side with the Medes." If there were a cognate verb *persein* ("Persianize"), the real or intended meaning would be "you wish him to Persianize," while the literal meaning is, "you wish to destroy him."
345. *Archê* means both "rule," or "command," and "start," or "beginning."
346. *Philippus* 61, *Panegyricus* 119, *De Pace* 101.
347. *Anaschetos*, as an adjective, means "endurable," but is also a proper name. An English equivalent would be, "There is no bearing Baring."
348. *Xenos* means "strange" (adjective) and "stranger" (noun).
349. Fr. 209 Kock. Author unknown.
350. Fr. 64 Kock.

the more popular it is. The cause of this is that learning comes about more because of opposition, and faster because of brevity.

And what is said should in addition always apply to the person addressed and be correctly expressed, if it is going to be true and not superficial; for these may be separate. For example, "One should die erring in nothing"; yes, but it is not elegant.[351] "A deserving man should marry a deserving woman";[352] yes, but it is not elegant. But if both are present at the same time it is elegant: "He deserves to die who does not deserve to die." And the more it has of these, the more elegant it appears—for example, if the names are a metaphor too, and a metaphor of the relevant sort, and there is antithesis, equalization, and it has activity.

Popular similes too, as has already been said above,[353] are also, in a way, metaphors; for they are always stated on the basis of two [relations], just like a metaphor by analogy—for example, "The shield," we say, "is the wine-saucer of Ares"[354] and "The bow is a stringless lyre."[355] This way of stating it, then, is not simple, while to say that the bow is a lyre or the shield a wine-saucer is simple. People also make similes in this way—for example, by likening a pipe player to an ape, or a shortsighted person to a spluttering oil-lamp (for both contract). And it is done well when it involves metaphor; for it is possible to liken a shield to "the wine-saucer of Ares" and a ruin to "the rags of a house," and to say that Niceratus is a like a "Philoctetes stung by a Pratys"—a simile used by Thrasymachus when he saw Niceratus, after his defeat by Pratys in a rhapsode contest, still long-haired and parched. It is especially in regard to these that poets are hissed off the stage, if they do not make them well, and if they do make them well, that they are popular. I mean when they would introduce a corresponding [metaphor]: "like curly celery the legs he wears,"[356] and "like Philammon punching his leather bag,"[357] and all things of this sort are similes. That similes are metaphors has been stated many times.

Proverbs are also metaphors, though from form to form. For example, if someone brings something into his house, being himself persuaded that it is good, and then is harmed, it is as "the Carpathian says of the hare"; for both suffered what was described.[358]

351. Source unknown.
352. Fr. 206 Kock. Author unknown.
353. 1407ᵃ11–14, 1410ᵇ15–18.
354. Timotheus, Fr. 21 Page. 1407ᵃ17–18.
355. Fr. 33 Page. Author unknown.
356. Fr. 207 Kock. *Selinon* is properly "celery," though also "parsley" (= *petroselinon*, or "rock celery"). Because of its curly labia-like leaves it is used in comedy and elsewhere as a slang term for the female genitals. It is this that makes *selinon* not just an element in a simile corresponding to legs, but also a metaphor. He wears his own twisted legs = he is "wearing" a woman's genitals on his penis. The next example also involves a sexual double entendre.
357. Fr. 208 Kock. A *kôrukos* is both a leather punching bag and a slang term for the male scrotum. It is apparently this that makes it a metaphor: punching his leather bag = masturbating.
358. Hares were introduced into the island as a benefit, but did more harm than good.

The sources of elegant expressions, then, and the cause due to which they are such have been pretty much stated.

Popular hyperboles are metaphors too. For example, saying of someone with a black eye that "you would have thought he was a basket of mulberries"; for his eye is somewhat purple, but there is exaggeration in the quantity. And in the expression "like so-and-so" there is hyperbole that differs in the style: "like Philammon punching his leather bag," and, "you would have thought that he was Philammon punching his leather bag," and, "like curly celery the legs he wears," and, "you would have thought he had celery for legs, so curly are they." Hyperboles are characteristic of young people; for they exhibit great exaggeration. That is why they are most used by those who are angry:

> Not even if he gave me as many gifts as there is sand or dust . . .
> Nor will I marry a daughter of Atreus' son, Agamemnon,
> Not even if she rivals Aphrodite the golden in beauty,
> Or the works of Athena.[359]

That is why it is unfitting for an older person to use it. (This [figure of speech] is **1413b1** especially used by Attic orators.[360])

3.12
Each Kind of Rhetoric Has Its Own Style

One should not overlook the fact, however, that a distinct style is fitting for each kind [of rhetoric]. For the writing style and the debating style are not the same; neither are the style of public oratory and judicial style. But it is necessary [for an orator] to know both; for the craft of debate involves having a scientific knowledge of how to speak correct Greek, while writing involves not being compelled to keep anything silent that one may wish to communicate to others—which is precisely the condition of those who do not have the scientific knowledge of how to write.

Writing style is the most exact, while debating style is most suited to delivery. And of the latter there are two forms; for one is expressive of character and the other of feeling. That is why actors too are in pursuit of these sorts of plays, and poets in pursuit of actors of these sorts. But poets who write plays suited to reading are also in demand—for example, Chaeremon (for he is as exact as a professional speechwriter), and, among the dithyrambic poets, Licymnius. And, when compared, the speeches of the writers appear thin in debates, while those of the orators appear prosaic in the hands. The cause of this is that their fitting place is in debates—which is why speeches intended for delivery, when the element of delivery is removed, because

359. Homer, *Iliad* 9.385, 388–390.

360. This sentence is secluded by Kassel. In the mss. it appears before the previous sentence.

of no longer doing their work, appear foolish. For example, cases of asyndeton and frequent saying of the same thing are correctly rejected in writing style, but not in debating style—indeed, the orators use them; for they are suited to delivery. But one must vary the expression when one says the same thing—which is precisely the factor that, as it were, paves the way for delivery: "This is the one who stole from you, this is the one who cheated you, this is the one who last of all attempted to betray you."[361] Also, for example, what Philemon the actor used to do in Anaxandrides' *An Old Man's Madness*, when he says "Rhadamanthus and Palamedes," and, in the prolog of *The Pious Ones*, the word "I";[362] for if one does not deliver things of this sort [with variation], it become a case of "the man carrying a beam."[363]

Similarly, with cases of asyndeton, I "came, met, begged"; for these must be delivered, and not spoken as if they are one [expression], in the same character and tone of voice. Further, cases of asyndeton have a special affection; for many things seem to be being said at the same time; for the connecting particle makes the many into one, so that if it is removed, it is clear that the contrary will result: the one will be many. Therefore, it involves amplification: I "came, discussed, beseeched" (what is said seems to be many things), "he overlooked everything I said." This is what Homer **1414ᵃ1** wishes to do in the passage

> Nereus, again, from Syme . . .
> Nereus, son of Aglaia . . .
> Nereus, the most noble man who . . .[364]

For a person about whom many things are said must also be often referred to. If someone is often referred to, then, it also seems [wrongly] that many things are being said about him. So Homer amplified [Nereus' importance], though mentioning him in only one passage and by means of this fallacy made him memorable, though no account at all is given of him later on.

The style of public oratory seems altogether like illusionistic painting (for the greater the mob is, the more distant the view; which is why exactness is superfluous and gives a worse appearance in both cases), while judicial speech is more exact. And that before a single judge even more so; for it is least of all "rhetorical"; for what properly belongs to the thing at issue and what is alien to it is more easily surveyed [by him], and debate is absent, so that the judgment is clear. That is why it is not the same orators who are popular in all these. But where delivery is most a factor, there exactness is least present. And this is where voice is a factor, and most of all where a

361. Source unknown.
362. The idea, presumably, is that at these points Philemon used to repeat various lines in different formulations.
363. The point seems to be about the effects of repetition, which is like the uniform steps taken by someone carrying a beam.
364. *Iliad* 2.671–673.

loud one is. The epideictic style is most like that of writing (for its work is reading), while the judicial style comes second.

To make the further distinction that the style should be pleasant and magnificent is superfluous; for why that rather than temperate, generous, or some other virtue of character? For clearly the things we mentioned will make the style pleasant, if indeed the virtue of style has been correctly defined;[365] for otherwise for the sake of what should it be perspicuous and not low but appropriate? For if it is babbling, it is not perspicuous, nor if it is [too] concise, but it is clear that the mean is fitting. And the things mentioned will make the style pleasant, if they are well mixed: the customary and the unfamiliar, rhythm, and persuasiveness based on what is appropriate.

Style, then, has been spoken about, both in general about all kinds [of speech] and in a way special to each kind. It remains to speak about arrangement.

3.13
Arrangement

There are two parts to a speech; for it is necessary to state the thing at issue and also to demonstrate it. That is why to state without demonstrating or to demonstrate without having first stated is impossible; for the person demonstrating demonstrates something and the one first stating it first states it for the sake of demonstrating it. Among these, the former is the statement of the case and the latter the means of persuasion—just as if one were to make the division that one part was the problem and the other the demonstration.

As things stand, people make a ridiculous division;[366] for a narration surely belongs only in a judicial speech; for how in an epideictic speech or in one of public oratory can there possibly be the sort of narration they talk about, or replies to the opponent, **1414b1** or an epilog in demonstrative ones?[367] And an introduction, reply by comparison, and recapitulation sometimes occur in public speeches when there is a dispute, for in fact both accusation and defense often occur there, but not insofar as it is deliberative. Further, an epilog does not even belong in every judicial speech—for example, if the speech is short or if the thing at issue is easily remembered; for in the epilog what happens is that there is a reduction of length.

The necessary parts [of a speech], therefore, are the statement of the case and the means of persuasion. These, then, are its special ones, and the most it has are introduction, statement of the thing at issue, means of persuasion, and epilog; for the replies to the opponent belong to the means of persuasion, and the reply by

365. 1404b1–5.

366. Introduction (*prooimion*), narration (*diêgêsis*), means of persuasion (*pistis*), epilog (*epilogos*).

367. I.e., judicial speeches as they are required to be in cities that are in good legislative order (1354a18–26).

comparison is amplification of one's own case, so that it is a part of the means of persuasion; for one who does this demonstrates something, while the introduction does not and neither does the epilog, but rather serves as a reminder.

If one were to go on making divisions of this sort, then, which is precisely what the followers of Theodectes do, there will be a distinct narration, a post-narration, and a pre-narration, as well as a refutation and an additional refutation.[368] But a name should be assigned [only] if speaking of a form and a difference, otherwise it becomes empty and frivolous, like the ones Licymnius produced in his *Craft*, naming things "wafting," "wandering," and "ramifications."

3.14
The Introduction

The introduction is a speech's starting-point, which is precisely what a prolog is in poetry and a prelude in pipe playing; for all these are starting-points and a paving of the way, as it were, for what follows. The prelude is like the introduction in epideictic speeches; for in fact as pipe players play as a prelude whatever they are able to play well and join it to the keynote of the piece, so too in epideictic speeches this is the way one should write: after saying whatever one wishes, straightaway sound and join the keynote. And this is precisely what all writers do. A paradigm is the introduction in Isocrates' *Helen*, where there is nothing in common between those who employ contentious arguments and Helen. At the same time, even if the writer wanders into foreign territory, it is fitting for the whole speech not to be of the same form.

The introductions in epideictic speeches say things that are based on praise or blame—for example, Gorgias in his *Olympic Speech*, says, "You are worthy of the admiration of many, men of Greece . . . ;"[369] that is, he praises those who first brought the festal assemblies together, while Isocrates blames them because they honored the virtues of the body with gifts, but awarded no prize to those who think well. They also begin with advice—for example, that one should honor good people, which is why [the speaker] himself praises Aristides, or those who are neither well reputed nor bad but good though living in obscurity, like Paris the son of Priam; for one who speaks in this way offers advice. Further, they are based on introductions in judicial speeches, that is, on the appeals to the listener, if the speech concerns something **1415ᵃ1** unacceptable, hard to bear, or oft-repeated by many, in order to obtain sympathetic consideration [for discussing it]—for example, Choerilus': "Now when all subjects have been allocated. . . ."[370] The introductions in epideictic speeches, then, are based on the following: on praise, on blame, on exhortation, on dissuasion, and on appeals

368. The Greek terms are *epidiêgêsis, prodiêgêsis, elegchos, epexelegchos*.
369. B7 DK.
370. Fr. 1, 1a Kinkel.

to the listener. And they should be either unfamiliar or closely related to the keynote of the speech.

Introductions in judicial speeches should be taken to have precisely the same capacity as prologs in plays and introductions in epic poems; for those in dithyrambs are like those in epideictic speeches—for example, "due to you and your gifts or your battle spoils."[371] In the speeches and in epic poems there is a sample of the account, in order that the listeners may have some foreknowledge of what the account is about and their thought not kept in suspense; for what is unlimited makes a listener's thought wander, while the one who gives the starting-point into the listener's hand, so to speak, enables him, by holding on to it, to follow the account. This is why [we have]: "Sing, goddess, the wrath . . . ," and "Tell me, Muse, of the man . . . ,"[372] and

> Bring me another account, about how from the land of Asia
> There came to Europe a great war.[373]

The tragedians too make clear what the play is about—if not straightaway, as Euripides does, at any rate, somewhere in the prolog, as Sophocles does: "My father was Polybus. . . ."[374] And the comic dramatists do the same thing.

The most necessary and the special work of the introduction, then, is this: to make clear what the end is that the speech is for the sake of. That is why if the thing at issue is clear or [the speech] short, one should not use an introduction.

The other forms of introduction that are used are remedies and are common [to all the kinds of speeches]. These say things based on the speaker, the listener, the thing at issue, and the opponent. Those based on the speaker himself and the opponent are all those concerned with refuting or making an accusation. But these are not done in the same way; for in the defendant's case what comes first are the things having to do with the accusation, while in the accuser's they come in the epilog. Why this is so is not unclear; for the defendant, when he is about to introduce his own case, must do away with any hindrances to it, and so must first refute the accusation. But the one attacking him should put his accusation in the epilog in order that the listeners may remember it better.

Appeals to the listener [in the introduction] are based on producing goodwill and sometimes on making him attentive; for it is not always advantageous to make him attentive, which is why many speakers try to provoke laughter. Many things will lead to ease of learning, if the speaker wishes it, including his appearing to be a decent person; for the listeners pay more attention to such people. And they are attentive to
1415b1 large things, to their own private affairs, to wondrous things, and to pleasant ones. That is why one should try to produce the impression in them that one's speech is

371. Attributed to Timotheus, Fr. 18 Page.
372. The opening lines of the *Iliad* and *Odyssey*.
373. From the introduction to Choerilus, *Persica*. Fr. 1a Kinkel.
374. *Oedipus Tyrannus* 774. Reading ἐμοὶ πατὴρ ἦν Πόλυβος.

about such things; for, if they are not attentive, it is because the issue is small, has nothing to do with them, or is painful. But one should not overlook the fact that all such things are outside the argument; for they are addressed to a listener who is base and ready to listen to what is outside the thing at issue; for if he were not like that, there would be no need of an introduction, except for one that stated the thing at issue in headline form, in order that it have a head, as if it were a body.

Further, making the listeners attentive is common to all the parts [of the speech], if there is a need for it; for they are inclined to slacken more anywhere than at the start. That is why it is ridiculous to put it at the start, when all listen with the greatest attention. So wherever it is opportune, one should say, "and now give me your attention, for this concerns me no more than it does you," or "I'll tell you something strange, you've never heard the like of it," or anything so wondrous. This, as Prodicus said, is "to throw in some of the fifty-drachma lecture when the listeners nod."[375] But it is clear that this is not addressed to the listener insofar as he is a listener.

In fact all speakers in their introductions are either accusing or refuting accusations. [As in:] "My lord, I will not say that eagerly,"[376] and "why this introduction?"[377] Also, those who have, or believe themselves to have, a bad case [make use of introductions]; for it is better to spend time on anything other than the thing at issue. That is why slaves [when accused of something] do not answer questions but rather state the surrounding circumstances and produce introductions.

The sources from which one should produce listeners with goodwill and each of the other things of that sort have already been stated.[378] But since "grant that on reaching the Phaeacians I may find friendship or pity"[379] is well said, these are the two things one should aim at.

In epideictic introductions, however, one should make the listener think that he shares in the praise, either himself, his family, his practices, or in some other way;[380] for what Socrates says in the funeral oration is true, that it is not difficult to praise Athenians in front of Athenians, but in front of Spartans.[381]

Introductions in public oratory are based on those of judicial speech, but by the nature of the case there is little need of them; for in fact they are concerned with what the listeners also know, and the thing at issue needs no introduction, except because of the speaker himself or his opponent, or if the listeners do not take the thing to have the importance the speaker wishes, but either more or less. That is why it is necessary to accuse or to refute accusations, to amplify or diminish. And it is for the sake of

375. A12 DK.
376. Sophocles, *Antigone* 223. The messenger is reluctantly reporting the burial of Polyneices to Creon.
377. Euripides, *Iphigenia in Taurus* 1162. Thoas fears what Iphigenia is about to tell him.
378. 1378ᵃ19–20.
379. Homer, *Odyssey* 7.327.
380. Reading ἄλλως.
381. 1367ᵇ8–9.

these things that an introduction is needed, or for the sake of ornamentation, lest the
1416a1 speech appear off-handedly done without it. For Gorgias' encomium to the Eleans is like that; for without any preliminary sparring or warm-ups he starts at once by saying, "Elis, happy city."[382]

3.15
Topics Concerning Accusation

One [topic] concerning accusation is based on anything with which one might remove offensive prejudice; for it makes no difference whether someone has expressed it or not, so that this way is universally applicable.

Another topic is to contest the things that are disputed: either they did not occur, or they were not harmful, or not harmful to this person, or not harmful to this degree; or they were not unjust, or not very, or not shameful, or without importance; for dispute is about things of this sort, as in the reply of Iphicrates to Nausicrates; for he said that he had indeed done what Nausicrates claimed and that it had caused harm, but that he had not done an injustice. Or, though admitting the injustice, counterbalance it: if it caused harm, that it was nonetheless noble, and if it caused pain, it was nonetheless beneficial, or something else of that sort.

Another topic: that it was an error, or a stroke of bad luck, or necessary, as Sophocles said that he was trembling not, as his accuser said, in order to seem old, but out of necessity; for it was not by his own volition that he was eighty years old. Also, the for-the-sake-of-which may counterbalance it—for example, that you did not wish to harm but rather so-and-so, and you did not do the thing of which you are accused, though it happened to have harmed: "Hating me would be just, if I had acted so as to bring it about."

Another: if the accuser is also involved [in similar actions], either at the present time or previously, either himself or one of those close to him. Another: if there are others who are involved [in similar actions] but are agreed to be not guilty of the accusation—for example, if so-and-so is an adulterer, because he is dressed in a refined way, what's-his-name must also be one. Another: if the accuser or someone else has accused others, or if—without [a formal] accusation—they were under the same suspicions as the defendant is now, and were shown not guilty. Another is based on counter accusing the accuser; for it is absurd, if he himself is untrustworthy, for his words to be trustworthy.

Another: if there has already been a judgment of the matter, as in Euripides' reply to Hygiaenon in an exchange of property trial,[383] when he was accused of impiety

382. B10 DK.

383. A person A assigned a public service could argue that another B was better able to pay its cost. He challenged B in court either to carry out the service in his place, if B admitted he was richer, or to exchange his wealth for A's, and then A would carry it out.

for having written a line encouraging perjury: "The tongue swore, but the mind is unsworn."[384] For he said that Hygiaenon was doing an injustice by bringing a judgment into the law courts that belonged in the court of Dionysus;[385] for there is where he gave an account of these words or where he will give one if anyone wished to bring an accusation.

Another is on the basis of accusing the accusation [itself], how great an evil it is, and this because it produces different judgments and because it does not persuade as to the thing at issue.

Common to both sides is the topic of speaking with [reference to] symptoms.[386] For example, in the *Teucer*, Odysseus claims that Teucer is closely related to Priam; **1416^{b}1** for [his mother] Hesione was Priam's sister; while Teucer says that his father Telamon was Priam's enemy, and that he has not betrayed the spies.

Another, for the accuser, is to praise some small thing at great length and then blame something big in a concise way, or first to present many good things, and then put forward the single thing that bears on the thing at issue and blame it. Speakers of this sort are most crafty and most unjust; for they attempt to do harm by means of good things, [that is,] by mixing them with what is bad.

Common to both attacker and defender is that, since the same action may be done for the sake of many things, the accuser should present the character as bad and interpret the thing in a worse direction, the defender in a better one—for example, saying that Diomedes deliberately chose Odysseus, on the one side, because he took Odysseus to be the best, and, on the other, not because of that, but because he alone, as someone inferior, would not be a rival.[387]

Concerning accusation let this much be said.

3.16
Narration

Narration in epideictic speeches is not continuous but part by part; for one should go through the actions on which the speech is based; for the speech is composed, on the one hand, from what is outside the province of craft (for the speaker is in no way the cause of the actions) and, on the other, from what comes from the craft, which consists in proving either that the actions did take place, if the audience is not persuaded, or that they were of a certain quality, of a certain quantity, or even all of them. This is why one should sometimes not narrate everything continuously, because things proved in this way are difficult to remember: on the basis of some actions the person is proved to be courageous, on the basis of others, wise or just.

384. Euripides, *Hippolytus* 612.
385. I.e., the theater, which is the proper venue in which to judge a play.
386. I.e., signs.
387. 1399^{b}28–29.

Also, a speech composed in this way is simpler, while in the other way it is complex and not plain sailing. Of well-known actions, the listener should just be reminded. That is why many people have no need of narration. For example, if one wishes to praise Achilles (for everyone knows his actions), one should instead make [other] use of these. If, on the other hand, one wishes to praise Critias, he does need it, for not many people know [his good actions]. {. . .}[388]

But nowadays [writers on rhetoric] say—ridiculously—that the narration should be rapid. And yet, as the man said to the baker when asked whether he should knead the dough hard or soft ("What?" he said, "is it not possible to do it well?"), so here too the case is similar; for one should not narrate at great length, just as one should not produce introductions or state the means of persuasion at great length either; for, in these cases too, doing these things well is not a matter of rapidity or concision but of [due] measure. And this consists in saying just as much as will make the thing at issue clear, or as much as will make the listener suppose that it has happened, that harm or injustice has been done, or things of whatever magnitude one wishes their magnitude to be—or, for the opponent, the opposites of these.

And one should narrate as an aside whatever bears on one's own virtue, for example, "I criticized him, by always stating what was just, telling him not to abandon the children," or bears on the opponent's vice, "but he answered me that, wherever he might find himself, there he would find other children"—which is what Herodotus[389] tells us the Egyptians who had revolted replied [to the king who had invited them to return], or what is pleasing to the judges.

For the defender the narration may be shorter; for what is disputed is either that the thing has not happened, was not harmful, was not unjust, or was not of the alleged magnitude. So one should not spend time on what is agreed, unless it contributes to [making the case]—for example, that the action was done, but that it was not unjust. Further, one should speak of the actions as done in the past, except for those that, when presented as being done in the present, conduce to pity or indignation. A paradigm is the story of Alcinous, as it is told to Penelope in sixty lines, or as Phaÿllus told the epic cycle, or the prolog in the *Oeneus*.

The narration should be expressive of character. And it will be if we know what makes the character. One thing that certainly does so is making the deliberate choice clear, and it is by the quality of this that the character is of a certain quality, and it is by its end that the deliberate choice is of a certain quality. This is why mathematical arguments do not involve character, because they do not involve deliberate choice (for they do not involve the for-the-sake-of-which), but the Socratic arguments do (for they speak of things of this sort[390]).

388. There seems to be a lacuna in the text at this point, which some mss. fill with a repeat of 1367b28–1368a10.

389. 2.30 (paraphrased).

390. Reading περὶ τοιούτων γὰρ λέγουσιν.

Other things expressive of character are those that follow along with each particular character—for example, that someone walks away as he was talking; for this makes clear his insolence and boorishness of character.

And do not speak as from thought, as they do nowadays, but as from deliberate choice: not "I wished it" or "for I deliberately chose it," but, "although I gained no benefit, it was better." For the former is characteristic of a practically wise person, the latter of a good one; for what is characteristic of a practically wise person consists in the pursuit of what is beneficial, and of a good one in that of what is noble.

If anything seems unpersuasive, also state its cause, as Sophocles does. A paradigm is the passage from the *Antigone*, that Antigone cared more for her brother than for either her husband or children; for if they perished they might be replaced,

> But when mother and father have gone to Hades
> No brother could ever be born.[391]

If you do not have a cause, say that you are not unaware that the things you are saying are unpersuasive, but that you are by nature a person of this sort, and in fact people are never persuaded that anyone voluntarily does anything other than what is advantageous.

Further, speak on the basis of feelings, narrating both the things that follow along with them, which the listeners know, and the ones that are special to oneself or to one's opponent: "And off he went, scowling at me," and, as Aeschines says about Cratylus, that he was "furiously hissing and furiously shaking his fists"; for these are means of persuasion, because these things they do know become symptoms of those they do not know. Many things of this sort are to be gotten hold of from Homer: "Thus she spoke, and the old nurse covered her face with her hands";[392] for those who start to cry put their hands over their eyes.

Also, you should straightaway present yourself too as a person of a certain sort, in order that the listeners may see you as such—your opponent as well; but do it concealing that you do it. And this should be easy to see from messengers; for we know nothing of what they are going to say. Nonetheless, we get some notion of it [from their demeanor]. Narration, though, should occur at many places, and sometimes not at the start.

In public oratory there is hardly any narration, because no one narrates about future things. But if there is narration at all, it is about things in the past, in order that, reminded of them, the listeners will deliberate better about things to come. In the latter case, however, the speaker does not do the work of an advisor. And if something is unpersuasive, promise to state the cause straightaway and to set it out with as many details as the listeners wish—for example, Jocasta in Carcinus' *Oedipus*

391. 911–912.
392. *Odyssey* 19.361.

is always promising, when the one inquiring about her son asks her questions, and Sophocles' Haemon.[393]

3.17
Means of Persuasion

Means of persuasion should be demonstrative, and, since dispute is concerned with four issues, the demonstration should bear on the disputed one—for example, if whether the thing happened or not is disputed, in the trial, the demonstration should most of all bear on this; if that it did no harm, on this; and if that it was not of such-and-such magnitude, or that it happened justly, likewise. And if the dispute is about whether this thing happened, do not forget that it is only in this dispute that it is necessary for one or other of the two opponents to be wicked; for ignorance is not the cause, as it might be if the dispute were about justice. So in this case one should spend time on it, but in the others one should not.

In epideictic speeches amplification is mostly for [arguing] that things are noble or beneficial; for the things at issue should be taken on trust. And in fact demonstrations rarely bear on these, unless they are unpersuasive, or someone else is held to be the cause of them.

In the speeches of public oratory one may dispute that something will be, or that though the things he [that is, the opponent] recommends will be, they will not be just, or beneficial, or of such-and-such magnitude. And one should also look to see whether anything outside the thing at issue is falsely stated; for such things appear to be proofs that the other ones are falsely stated too.

1418a1 Paradigms are more suited to public oratory, enthymemes to judicial oratory; for the former is concerned with the future, so it must quote paradigms from past events, while the latter is concerned with things that are or are not the case, which more admit of demonstration and of necessity; for what is past has a necessity about it.

Enthymemes should not be stated successively, but rather mixed in. Otherwise, they damage each other. For there is a defining mark of their quantity, "my friend, since you have spoken as much as a wise man should"[394]—yes, but not such things as he should. And do not look for enthymemes about everything. Otherwise, you will do precisely what some of those doing philosophy do, who deduce things that are better known and more persuasive than the things on the basis of which they state them. And when you are trying to arouse feelings, do not speak in enthymemes; for an enthymeme either knocks out feeling or is spoken pointlessly; for simultaneous movements knock out each other and either extinguish each other or make each other weak. Nor, when the speech is expressive of character, should you look for

393. The reference, apparently, is to *Antigone* 683–723.
394. Homer, *Odyssey* 4.204.

an enthymeme at the same time; for demonstration involves neither character nor deliberate choice.

Maxims should be used both in a narration and in a means of persuasion; for they are expressive of character: "And I have given the money—and this while knowing [the maxim] that one should not trust anyone." Or to arouse feelings: "And I do not regret it, although I have been treated unjustly; for though the profit remains his, the justice remains mine."

Speaking publicly is more difficult than judicial speaking, as makes perfect sense, because it is concerned with the future, the latter with what happened in the past, which is scientifically knowable "even to prophets,"[395] as Epimenides the Cretan said; for he used to "prophesize" not about the future things but about things that happened in the past but were unclear. And the law is a given in judicial speeches, and, having a starting-point, it is easier to find a demonstration. Also, public speaking does not afford many opportunities for leisurely digressions—for example, against the opponent, or about oneself, or to arouse feelings. On the contrary, it least of all does so, unless one wanted to divert attention. Therefore, when at a loss, one should produce a digression, precisely as the orators in Athens do—Isocrates too; for, even when giving advice, he brings accusations—for example, against the Spartans in the *Panegyricus*, and against Chares in *On the Peace*.

In epideictic speeches one should introduce episodes of praise, as Isocrates does; for he is always bringing someone in for this purpose. And what Gorgias used to say, that he was never left without a word, comes to the same thing; for if he is speaking about Achilles, he praises Peleus, then Aeacus, then the god, and likewise with [his] courage, which produces these and those things, or is of such-and-such a sort.

If you possess demonstrations, you should speak both in a way expressive of character and demonstratively, but if you do not possess enthymemes, in a way expressive of character. And to a decent person it fits more to appear good than an exact argument does. **1418^{b}1**

Refutative enthymemes are more popular than demonstrative ones, because whenever something produces a refutation, it is more clear that it deduces; for contraries set side by side are more readily known. Refutative ones directed against the opponent are not a distinct form, however, but belong among the means of persuasion. Some refute by objection, others by [counter] deduction.[396]

In both deliberative and judicial speech the starting speaker should state his own means of persuasion first, then meet the contrary ones, refuting them and pulling them to pieces beforehand. But if the opposition's case is prolific, meet the contrary points first, as Callistratus did in the Messenian assembly; for first refuting by anticipation the things they were likely to say, he then stated his own case. If you speak second, however, you should first speak to the contrary argument, refuting it and

395. B4 DK.

396. Reading τὰ μὲν λῦσαι ἐνστάσει τὰ δὲ συλλογισμῷ.

counter deducing, especially if it proved popular; for just as the soul is not receptive to a person against whom accusations have been made beforehand, in the same way it is not receptive to argument either, if the opponent seems to have spoken well. Hence one should make room in the listener for the argument one is going to give. And this will happen if you do away with [the opponent's arguments]. That is why it is by fighting against all of them, or the most important, the popular, or the easily refuted ones, that one will make one's own persuasive:

> The goddesses I will be allied with first, . . .
> For I do not think that Hera . . .[397]

In these lines [Hecuba] seizes first on what is most foolish.

So much for means of persuasion. As regards character, since there are some things which, if one says them about oneself, leave one open to envy, to a charge of long-windedness, or to disputation, and, if one says them about another, to a charge of abusiveness or boorishness, one must make another say them, precisely as Isocrates does in the *Philippus* and the *Antidosis*; as Archilochus does when he blames someone; for he makes the father say about his daughter in an iambus, "Nothing is unexpected or declared impossible on oath," and makes Charon the carpenter say in the iambus that starts, "Not for me the wealth of Gyges."[398] And as Sophocles does, when he makes Haemon speak to his father about Antigone as [reporting] what others say.[399] And sometimes one should also change one's enthymemes and turn them into maxims. For example, "People with understanding should bring about reconciliation when fortunate; for that way would be conducive to getting most." And expressed as an enthymeme, "For if it is whenever reconciliation is most profitable and conducive to getting most that one should be reconciled, then it is when one is fortunate that one should be reconciled."

3.18
Questioning

As for questioning, it is most opportune to do it when the opponent has stated one of
1419a1 the two [premises], so that when one additional question is asked something absurd results. For example, when Pericles questioned Lampon about the sacred rites of the savior goddess,[400] he replied that it was not possible for an uninitiated person to hear them. When asked if he knew them himself, he said he did. Pericles then asked, "And how so, since you are uninitiated?"

397. Euripides, *Trojan Women* 969, 971.
398. Fr. 122, Fr. 19 West.
399. *Antigone* 688–700.
400. I.e., Demeter.

Second, it is opportune when one point is evident and it is clear to the questioner that the opponent will grant the other; for having learned that [second] premise, he should not additionally ask about the evident one but should state the conclusion. For example, when Meletus stated that Socrates did not acknowledge the gods, but admitted that there was something he called a *daimonion*,[401] Socrates asked if *daimons* were not either children of gods or something divine, and when Meletus said, "They are," he replied, "Does anyone think there are children of gods but not gods?"[402]

Further, when the speaker is intending to prove that the opponent is stating contrary things or something unacceptable.

Fourth, when it is not possible for the opponent to refute you except by answering in a sophistical way; for if he answers that "it is so but it is not so," or "some are so, some are not," or "in one way it is so, in another not," the listeners shout out on the supposition that he is at a loss to answer. Otherwise, you should not attempt it; for if the opponent gets in an objection, you will seem to be beaten; for it is not possible to ask many questions, because of the weakness of the listener. That is also why one should compress enthymemes as much as possible.

One should give answers to ambiguous questions by dividing them by account and not concisely. And answers to things that seem to be contraries should be conveyed straightaway by the answer [itself], before [the opponent] asks further questions or deduces the conclusion; for it is not difficult to foresee the drift of the argument.

This and the means of refutation may be taken as evident to us from the *Topics*.[403]

When a conclusion is being drawn, if [the opponent] frames the conclusion as a question, you should state the cause. For example, when Sophocles was asked by Pisander if it seemed good to him, as it did to the other preliminary councilors, to put in place the Four Hundred, he said it did. "What? Did this not seem to you to be a wicked thing?" He said it did. "Therefore, what you did was wicked?" "Yes," he said, "for nothing else was better." And when the Spartan, who was being inspected for his term as overseer, was asked whether it seemed to him that the other overseers had been justly put to death, he said that it did. "But did you not put in place these same measures?" And he said that he did. "Therefore, would you not," he was asked, "be justly put to death too?" "No, indeed not," he said, "for they took bribes to do these things, while I did not, but rather with due consideration." That is why one should neither ask any question after drawing the conclusion nor frame the conclusion as a question, unless the balance of truth is much in one's favor. **1419^{b}1**

As for jokes, since they seem to have some use in debates, and Gorgias rightly said that one should "destroy the opponents' seriousness with laughter and their laughter with seriousness,"[404] we have stated in the *Poetics*[405] how many forms of jokes there

401. Reading εἴρηκεν ὡς ἂν δαιμόνιόν τι λέγοι.
402. Plato, *Apology* 27b–28a.
403. Book 8.
404. B12 DK.
405. Presumably in its lost second book. See F167.

are. Among these, one lot is fitting for a free person, the other not. And so a speaker will take whatever one is fitting for him. Self-deprecation is more suited to a free person than buffoonery; for the self-deprecator makes a joke for the sake of himself, while the buffoon makes it for the sake of someone else.

3.19
Epilog

The epilog is composed of four things: what produces in the listener a good disposition toward the speaker himself and a bad one toward the opponent; amplifying and minimizing; what brings the feelings of the listener into a certain state; and recollection.

For the natural thing for him to do, after he has demonstrated that he is truthful and his opponent false, is to praise and blame and drive the point home. And one of two things should be aimed at: that he is a good person in the relevant respects or that he is one unconditionally or that his opponent is a bad person in the relevant respects or that he is one unconditionally. And the topics on the basis of which he should establish them as being of these sorts have been stated.[406]

After this, it is accord with nature to amplify or minimize what has already been proved; for the things at issue should be agreed to, if one is going to speak of their magnitude; for the growth of bodies too is from something preexisting. The topics from which amplifying and minimizing should be set forth were stated earlier.[407]

After this, when the things, their sorts, and how great they are are clear, one should induce the listener to feel the [relevant] feelings. And these are pity, indignation, anger, hatred, envy, jealousy, and strife. Their topics too were stated earlier.[408]

So it remains to recollect the things that were said previously. And this it is fitting to do in the way that people—speaking incorrectly—say one should do it in introductions; for in order to be easily learned, they prescribe saying things many times. But what one should in fact do [in the introduction] is state the thing at issue, in order that it not escape notice what the judgment is about, while here, in the epilog, one should speak in summary form of the things through which the conclusion has been proved.

And the starting-point is for the speaker to state that he has demonstrated the things he promised, so that what these things are and why they hold should be mentioned. And it is stated on the basis of a comparison with the opponent's case—comparing either what both have said about the same thing (for example, "but he said this about this, while I said that, and because of these things") or straight down point by point. Or on the basis of self-deprecation (for example, "he said this, while

406. 1.9.
407. 1368a10–29, 1393a8–16.
408. 2.1–11.

I said that—and what would he have done if he had proved this, but [I had] not [proved] that?"). Or on the basis of questioning ("what has not been proved?" or "what did he prove?")—either by comparison or in a way that is in accord with nature given the statements made, first one's own, and again, if one wishes, those of the opponent separately. **1420^{b}1**

For one's final utterance the fitting thing is an asyndeton, in order that it be an epilog and not a speech: "I have spoken; you have listened; you have the facts; render judgment."[409]

409. A nod to Lysias, *Against Eratosthenes* 12.100.

POETICS*

1
Poetry as Imitation: Medium

Let us speak about the craft of poetry itself, and its forms, what capacity each of them has, and how plots should be constructed if the poetry is going to be done well, further, how many parts it should be composed of, and of what sorts, and similarly too about anything else related to this methodical inquiry, starting first, as is in accord with nature, from first things. **1447ª8**

Epic poetry and the poetry of tragedy, and further, comedy, dithyrambic poetry, most of the craft of pipe playing, and of lyre playing are all on the whole really imitations. But they differ from each other in three ways: in that the imitation has different media, different objects, or modes that are different and not the same. 15

For just as some people produce imitations of many things by making images with colors and shapes (some through craft, others through practice), still others do so by means of their voices, so too in the case of the crafts just mentioned, all 20 of them produce imitations using rhythm, speech, or harmony, either separately or in combination—for example, pipe and lyre playing (and indeed any other sort of playing that happens to be of the same sort as regards this capacity, such as playing the panpipes) make use only of harmony and rhythm, whereas the craft of dancers 25 makes use of rhythm only, without harmony—for these people too, through the rhythms that are shaped [into movements], produce imitations of characters, feelings, and actions. But the craft that uses unaccompanied prose or[1] verse—whether it mixes meters together or uses one single kind of meter—has no name up to now;[2] **1447ᵇ8** for we have no common name for the mime plays of Sophron and Xenarchus and for the Socratic dialogs, not even if someone were to produce their imitation in iambic trimeters, elegiacs, or any other such meter.

But people, to be sure, attach the making of poetry to the meter, naming some "elegiac poets" and others "epic poets," calling them "poets" not in virtue of imitation, but in virtue of their common use of meter. And in fact if a medical subject or 15 a topic on nature is dealt with in meter, people are accustomed to call the authors in the same way. But Homer and Empedocles share nothing in common apart from the meter. That is why, while it is right to call the former a "poet," the latter should

* Translated by C. D. C. Reeve. Text: R. Kassel, *Aristotelis De Arte Poetica* (Oxford, 1965), in consultation with P. Destrée, *Aristote Poétique* (Paris, 2021) and L. Tarán and D. Gutas, *Aristotle Poetics* (Leiden, 2012).

1. Reading ψιλοῖς ἤ.

2. Reading ἀνώνυμος τυγχάνει οὖσα.

be called a "natural scientist" rather than a "poet." Likewise, if someone were to produce an imitation by combining all the meters, as Chaeremon did with his *Centaur* (a mixed piece of poetry composed of all the meters), he too should be called a "poet." About these matters, then, let things be determined in this way.

But there are some crafts that make use of all the media just mentioned (I mean, rhythm, melody, and meter) like dithyrambic poetry and nomes, and also tragedy and comedy. The difference is that some make use of all of these at the same time, others do so in different parts.

These, then, are what I mean by the differences between the crafts in the media in which they produce the imitations.

2
Poetry as Imitation: Object

1448a1 Since imitators imitate people in action, and since it is necessary that these people be either excellent or base (for when we speak of character it pretty much always follows along with one or the other of these alone—for, in terms of character, everyone differs because of vice and virtue), it follows that they imitate either better people than we are, or worse, or else such as we are. It is likewise with the painters; for Polygnotus made images of those who are better, Pauson of those who are worse, and Dionysius of those similar to us. So it is clear that each of the imitations I have mentioned will also contain these differences, and will be different by imitating things that are different in this way. For even in dance, pipe playing, and lyre playing these dissimilarities can occur, as also in speeches and unaccompanied verse—for example, Homer imitates those who are better, Cleophon those similar to us, whereas Hegemon of Thasos, who was the first to write parodies, and Nicochares, the author of the *Deiliad*, imitate worse ones. Likewise for dithyrambs and nomes; for one can imitate people in precisely the same way as Timotheus and Philoxenus imitated the Cyclops. It is this difference that distinguishes tragedy from comedy; for the latter tends to imitate people who are worse than those present now and the former those who are better.

3
Poetry as Imitation: Mode

Further, a third difference among these is the mode in which one can imitate each of these things. For in fact one can use the same media to imitate the same things, sometimes by narrating (either becoming someone else, as Homer does, or keeping to his own voice without changing), or with all the imitators[3] serving as actors and being active.

3. Reading τοὺς μιμουμένους.

Imitation, then, has these three differences, as we said from the start, media, objects, and mode. So, from one perspective, Sophocles would be the same sort of imitative poet as Homer; for both imitate excellent people. From another perspective, though, he would be the same as Aristophanes; for both imitate doers of action, that is, people who act (*dran*). From which derives what we call *dramas*, so some people say, because they imitate people acting.

And that is why the Dorians lay claim to both tragedy and comedy. For among Dorians, it is the Megarians who lay claim to comedy, since the Megarians from around here claim that it arose at the time they established their democracy and those in Sicily do so, for the poet Epicharmus, who was from there, was much earlier than Chionides and Magnes. As for tragedy, some Dorians in the Peloponnese lay claim to it. They make the names a sign of this; for they say that they call the outlying villages *kômai*, whereas the Athenians call them *dêmoi*, on the supposition that comedians (*kômôdoi*) owe their name not to *kômazein* (that is, from reveling) but rather from their roaming around from one *kômê* to another, driven out in dishonor from the city. They also say that they use the term *dran* for acting, whereas the Athenians use *prattein*. **1448^{b}1**

About the differences in imitation, then, both how many they are and what they are, let these things be said.

4
Origins and Development: Tragedy

It seems that there are two causes that quite generally gave birth to the craft of poetry, and both are natural. For it is both the case that imitation is innate in human beings from childhood (and they differ from other animals in that a human being is especially prone to imitate, and indeed takes his first steps on the path to learning through imitation) and that everyone takes pleasure in products of imitation. A sign of this is what happens in fact; for we take pleasure in viewing the most exact likeness of things that are in themselves painful to see—for example, the shapes of the most worthless animals, or even of corpses. The cause of this too is that learning is most pleasant, not only to philosophers, but also to the others, although they share in it to a small extent. For because of this indeed people take pleasure in seeing likenesses, because, in viewing them, they come to learn and deduce what each of their elements is—for example, that this person here is so-and-so. Since, if it so happens that one has not seen the thing before, its likeness will produce pleasure not as a product of imitation, but because of its execution, colors, or some other such cause.

Since imitating, then, comes naturally to us, just as harmonies and rhythms do (for that meters are parts of rhythms is evident), it was, from the start, those most naturally gifted in these who, by developing them little by little, gave birth to poetry out of [their] improvisations.

Poetry was split up in accord with each poet's proper character; for the more dignified poets imitated noble actions, that is, those characteristic of such people, whereas the shabbier ones imitated the actions of base people, at first producing invectives (*psogos*), just as the others produced hymns and encomia. We cannot cite any such poem from any of the pre-Homeric poets, though it is likely that there were many. But starting from Homer we can—for example, the *Margites* is his, and others of this sort. It is in these that, fittingly, the iambic meter was introduced. That is why indeed the meter is now called iambic, because people used to lampoon (*iambizein*) each other in this meter. And, of the old poets, some became producers of heroic verses [in hexameters], others of lampoons [in iambic meters].

Just as Homer was the poet par excellence when it came to serious subjects (standing alone not only because he composed well but because he also produced *dramatic* imitations), he was also the first to indicate the characteristic mode (*schêma*) of comedy, by giving a dramatic form not to an invective but to the ridiculous; for the *Margites* stands in the same relation to comedy as the *Iliad* and the **1449a1** *Odyssey* do to tragedy.

And once tragedy and comedy had been given a glimpse of, each poet was impelled by his individual nature to one or the other of these: some became authors of comedies instead of lampoons (*iambos*), while others composed tragedies instead of epics, because the characteristic modes of comedy and tragedy are greater and more honorable. (To investigate whether tragedy is now adequately developed in its forms, whether judged intrinsically or in relation to its audiences, is for another account.[4])

In any case, tragedy, and comedy too, arising from an improvisational starting-point (the former from the leaders of the dithyramb, the latter from the leaders of phallic songs, which still today remain an established custom in many cities), grew little by little as poets developed whatever of it was coming to light. And once tragedy had gone through a lot of changes, it stopped [changing], since it had acquired its own nature. Aeschylus was the first to increase the number of actors from one to two, to reduce the parts of the chorus, and make speech the protagonist. Sophocles introduced three actors and scenery.

Further, [tragedy changed] in terms of scale: from its original small-scale plots and ridiculous style of speech—due to its having been changed from satyr play—tragedy became dignified at a late date. And the meter, from tetrameter, became iambic. For at first poets used tetrameter because their poetry was akin to a satyr play and more suited to dancing. But once speech came in, the nature itself [of tragedy] discovered its proper meter. For of meters the iambic is the closest to speech. A sign of this is that we very often use iambics in speaking with each other, but hexameters we use rarely and when do, we depart from the harmony of speech.

4. No such account is extant. However, in *Po*. 26 tragedy is compared to epic poetry from these two perspectives.

Further, as for the number of episodes, and how each of the other parts is said to have been arranged, let us take them as having been described. For it would presumably take a lot of work to go through each of them.

5
Origins and Development: Comedy and Epic

Comedy, as we said, is an imitation of people of a baser sort—not, however, base with regard to every sort of vice; rather, the ridiculous is only one part of what is ugly and shameful. For the ridiculous is a sort of error and shame that is neither painful nor destructive—for example, a ridiculous mask is from the outset ugly and distorted but not pained.

Now the transformations of tragedy and the poets who brought them about have not been forgotten, but in the case of comedy they have been forgotten because it was not taken seriously at the start; for in fact the official granted a chorus of comedians[5] only at a late date—they used to be amateurs. The first names we have of comic poets belong to a time when comedy had already taken on some of its characteristic modes. But no one knows who introduced the use of masks, prologs, a multiplicity of actors, and other such things. As for the production of plots, it comes originally from Sicily. From among the Athenian poets, however, Crates was the first to abandon the form of the lampoon and produce universal accounts,[6] that is, plots. **1449b1**

Epic poetry follows tragedy up to the point of being an imitation in verse of excellent people. But they differ in that epic makes use of a single meter and is a narration. Further, with regard to length, tragedy tries to stay within the limits of a single revolution of the sun, or a little beyond, whereas epic is indeterminate in terms of time. And it does differ in this respect, even though at first poets composed in the same way in tragedies and in epics. As for their parts, some they have in common, whereas others are special to tragedy. That is why whoever knows about excellent and bad tragedies knows about epics too; for the parts epic poetry possesses also belong to tragedy, but those that tragedy possesses are not all in epic poetry.

6
Tragedy: Definition, Parts, Plot

The craft of imitation in hexameters and comedy we will discuss later on. But for now, let us speak about tragedy, by taking up the definition of its substance that results from what has been said: tragedy, then, is the imitation of a serious and complete

5. The earliest official competition for comedies in Athens was in 486 BC.
6. 1451b8–10.

action that has magnitude, in embellished speech, with each of its forms used separately in the parts of it, by people acting and not by narration, accomplishing through pity and fear the purgation (*katharsis*) of such feelings.

By "embellished speech" I mean the sort that has rhythm and harmony—and by saying "its forms are used separately" I mean that some parts of it are brought about through verse alone and some through melodies (*melos*).

Since the imitation is produced by people acting, the first component of a tragedy is of necessity the order of the spectacle, next melody-composition, and style of speech, for it is in these media that they produce the imitation. By "style of speech (*lexis*)" I mean the construction of the verses itself; the capacity of what I mean by "melody-composition (*melopoiia*)" is entirely evident.

But since tragedy is the imitation of an action, and an action is performed by doers of action who are necessarily of a certain quality as regards their character and their thought (for it is through these that we say that their actions too are of a certain sort), and it is with respect to actions that they all succeed or fail, the plot is the imitation of the action; for by this "plot (*muthos*)" I mean the composition of events. By "characters" I mean that with regard to which we say that the doers of action are of a certain quality. By "thought (*dianoia*)" I mean the parts in which they demonstrate something or even express some universal maxim by speaking.

Necessarily, then, every tragedy has six parts, in accord with which the tragedy is of a certain quality. These are plot, character, style of speech, thought, spectacle (*opsis*), and melody-composition. For the parts with which they imitate are two, one is the mode, and the remaining three are the objects they imitate. And there is nothing else besides these. It is not, then, just a few poets, as it were, who have made use of these;[7] for every tragedy has spectacle,[8] character, plot, style of speech, melody, and thought likewise.

But the most important of these is the structure of events. For tragedy is the imitation not of people but of actions, that is, of a life. But both happiness and misery lie in action, and the end is a certain action and not a quality; and it is in virtue of their character that people are of a certain quality, but it is in virtue of their actions that they are happy or the contrary.[9] Therefore, actors do not act in order to imitate characters, but rather take on characters because of their actions. So it is the events, that is, the plot, that are the end of tragedy, and the end is the most important thing of all.

Further, there would be no tragedy without action, but we could have a tragedy without characters; for the tragedies of most of the young poets are without characters, and, in general, there are many such poets, as also happens in painting—for

7. Reading οὐκ ὀλίγοι αὐτῶν.
8. Reading ὄψιν ἔχει πᾶν.
9. Reading καὶ εὐδαιμονία . . . τοὐναντίον.

example, Zeuxis in relation to Polygnotus: Polygnotus is a good painter of characters, whereas the painting style of Zeuxis contains no characters at all.

Further, if someone puts speeches in succession that are expressive of character, however well composed in terms of style of speech and thought, he will not do what we saw[10] to be the work of tragedy. On the contrary, a tragedy that makes inferior use of these but has a plot, that is, a structure of events, will fulfill it much more. In addition, the most important things by which tragedy beguiles the soul are parts of the plot, namely, reversals and recognitions.

Further, a sign of this is that even beginners in producing poetry can produce exactness in style of speech and in characters, prior to their being capable of combining events—for example, pretty much all the early poets too.

Thus, the plot is the starting-point and (so to speak) the soul of the tragedy, whereas the characters are secondary. The situation is much the same too in the case of painting; for if someone were indiscriminately to anoint a surface with the most beautiful colors, he would not please as much as he would if he made a likeness in black and white. Moreover, tragedy is the imitation of action and, because of this above all, it imitates doers of action.

Thought comes third. It is the capacity to say what is pertinent and what is fitting, which is precisely what, in speeches, is the work of politics and rhetoric. And indeed, the old poets made their characters speak in a way proper to politics, but present ones make them speak in a way proper to rhetoric.

Character is what reveals the deliberate choice, of what quality it is. That is why there is no character involved in those speeches in which what the speaker deliberately chooses to do or to avoid is not clear.[11] And there is thought involved in speeches in which people demonstrate something to be the case or not, or state something universal.

Style of speech holds the fourth place.[12] As mentioned above, what I mean by "style of speech (*lexis*)" is expression through use of names, which has the same capacity in verse as in prose.

Of the remaining parts, melody-composition is the most important of the embellishments. Spectacle is capable of beguiling the soul, but is furthest removed from the province of craft and least properly belongs to the craft of poetry; for tragedy's capacity exists even without a performance and actors. Besides, the craft of the maker of masks and other stage properties has more control over the production of spectacles than does the poet's.

10. 1450^{a}22–23.

11. Reading ὁποῖά τις ἐν οἷς οὐκ ἔστι δῆλον ἢ προαιρεῖται ἢ φεύγει.

12. Secluding τῶν μὲν λόγων.

7
Plot: Completeness and Magnitude

These things[13] having been determined, let us next state of what quality the structure of events should be, since that is the first and most important element of a tragedy.

We have laid down that tragedy is the imitation of a complete, that is, a whole action, having a certain magnitude; for there are also wholes that have no magnitude. And a whole is that which has a starting-point, a middle, and an end. A starting-point is what does not itself come after something else of necessity, but after which something else naturally occurs or comes to be. The end is the contrary: it is itself what naturally occurs after something else, whether of necessity or for the most part, but after which there is nothing else. The middle is what both itself comes after something else and after which something else comes. Therefore, well-constructed plots should neither start at a random point nor end at a random point but make use of the forms mentioned.

Further, a nobly beautiful thing, whether a living being or any object composed of parts, must not only have these properly ordered, but also have a magnitude that is not random—for noble beauty lies in magnitude and order, which is why a nobly beautiful animal can be neither altogether tiny (for the viewing of it is confounded since it happens within an extent of time that comes close to being imperceptible) nor altogether large (for viewing it cannot take place at the same time, and its unity and wholeness is gone from the viewers' view—for example, if there were an animal a thousand miles long). So, just as in the case of bodies and animals, though they must have magnitude, in the case of plots as well, though they must have length, their length must make them easy to remember.

As for the limit of the length, the limit that relates to performances and perception does not belong to the craft; for if a hundred tragedies had to compete, they would compete by the water clock, as people say they once did.[14] But as for the limit that is intrinsic to the nature of the thing at issue, in every case the longer the plot is, up to the point of still being clear as a whole, the more nobly beautiful, as regards its magnitude, it is. Determining the matter in simple terms: in whatever magnitude, in accord with likelihood or necessity, a succession of events can come about, in which a change from good luck to bad luck, or from bad luck to good luck, occurs—this is an adequate limit of the magnitude.

13. I.e., tragedy's parts.
14. Reading ὥσπερ ποτὲ καὶ ἄλλοτέ φασιν.

8
Plot: Unity

A plot is not one unity, as some people think, if it concerns one individual; for many, even an unlimited number of things, happen to one individual, from some of which no one unified thing is composed. And in the same way there are many actions of a single individual from which no one single unified action comes about. That is why all those poets err, as it seems, who composed a *Heracleid* or a *Theseid*, or poems of this sort; for they think that, since Heracles was one individual, it belonged to the plot to be one unity as well. But just as Homer was superior in other respects, it seems that, whether due to craft knowledge or due to nature, he also saw this correctly; for in composing the *Odyssey* he did not include everything that happened to Odysseus—for example, that he was wounded on Mount Parnassus or pretended to go mad when called to arms, the happening of neither of which events made it either necessary or likely for the other to happen. Instead, Homer composed the *Odyssey* around one single unified action of the sort we mentioned, and likewise too the *Iliad*.

It is necessary, then, that just as in the other imitative crafts a single imitation is of a single thing, so too the plot, since it is the imitation of an action, must be of one unified action and of it as a whole. And its parts, the events, must be so composed that if one of them is transposed or removed, the whole is disjointed and disturbed; for a thing whose presence or absence produces no clearly visible effect is no part of the whole.

9
Plot: Universality and Necessity

It is also evident from what has been said that the work of the poet is to speak not about things that have happened, but about things such as they could have happened and are possible in accord with likelihood or necessity. For the historian and the poet do not differ due to the one speaking in verse, the other without verse (for the histories of Herodotus could be set in verse, but they would be no **1451b1** less a sort of history when in verse than without verse). Instead, the difference is this: the one speaks about things that have happened, the other about things such as could happen. This is also why poetry is more philosophical and a more serious thing than history; for poetry speaks more about the universal, history about the particulars. The universal, on the one hand, is this: the sort of thing that a certain sort of person would say or do, in accord with likelihood or necessity, which is what poetry aims at, while adding proper names. A particular thing, on the other hand, is what Alcibiades did or what he suffered.

In the case of comedy this has already become clear; for after having composed a plot by means of likelihoods, comic poets assign random names, and do not, like the lampoonists, compose poems about particular individuals. But in the case of tragedy,

poets keep to the names of people there have been. The cause of this is that the possible is persuasive. But what has not happened, we are not yet persuaded is possible, whereas it is evident that what has happened is possible; for it would not have happened if it were not possible. Nonetheless, some tragedies in fact have only one or two familiar names, the others being made up, while others have none—for example, Agathon's *Antheus*; for in it the events and the names are alike made up, and yet it provides no less enjoyment. So one must not seek to cling at all costs to the traditional stories that tragedies are about. For in fact it is ridiculous to seek this, since even the familiar ones are known only to a few people, but they provide enjoyment to everyone, nonetheless.

It is clear, then, from these considerations that a poet should be a composer of plots rather than of verses, to the extent that he is a poet in virtue of imitation, and imitates actions. Therefore, even if it turns out that he produces imitations of things that have happened, he is no less a poet; for nothing prevents some of the things that have happened from being the sorts of things that are likely to happen, that is, that are capable of happening,[15] and it is in virtue of that aspect of them that he is a poet.

Of simple plots and actions, the episodic ones are the worst. By "episodic" I mean a plot in which the episodes follow each other with neither probability nor necessity. Such plots are composed by inferior poets because of themselves, but by good ones because of the actors; for while composing competition pieces and extending the plot beyond its capacity, they are often compelled to distort the succession of events.

1452a1 But the imitation is not only of a complete action, but also of events that cause pity and fear, and these mostly occur when they happen because of each other contrary to expectation; for they will contain more of the element of wonder this way than if they happened by chance or by luck, since even of events that happen by luck the most wondrous seem to be those that appear to have happened as if on purpose—for example, when the statue of Mitys in Argos killed the person who was the cause of Mitys' death by falling on him as he was looking at it; for such things seem not to happen fortuitously. So it is necessary for plots of this sort to be more nobly beautiful.

10
Plot: Simple and Complex

Of plots, some are simple and some complex; for in fact the actions of which the plots are imitations are from the outset also of these sorts. By "simple action" I mean one that comes about in a continuous and unified way (as has been defined), where the change of luck (*metabasis*) occurs without reversal or recognition. By "complex action" I mean one in which the change of luck involves a recognition, a reversal, or both. And these must arise from the structure of the plot itself, so that as a result

15. Reading καὶ δυνατὰ γενέσθαι.

of things that have previously come about, these things, either from necessity or in accord with likelihood, come about; for it makes a great difference whether these things happen because of those or [only] after those.

11
Reversal, Recognition, Suffering

A reversal (*peripeteia*) is a change in the actions to their contrary, as we said,[16] and this, as we are saying, in accord with likelihood or necessity—for example, in the *Oedipus* though the person came in order to bring joy to Oedipus and to relieve him of his fear about his mother, by revealing who he was, he did the contrary.[17] And in the *Lynceus*,[18] though Lynceus is being led as if he is going to be killed, and Danaus follows him as if to kill him, it so happens from the actions done that the latter is killed and the former saved.

Recognition (*anagnôrisis*), as the name itself signifies, is a change from ignorance to knowledge, which leads either to friendship or to enmity, between those whose relation to good luck and bad luck has been determined.

A recognition is most nobly beautiful when it occurs at the same time as a reversal, as with the one in the *Oedipus*. But there are certainly other sorts of recognition too; for also in relation to inanimate objects and random events it is possible for it to happen precisely in the way stated,[19] and one can recognize whether someone has done something or not done it. But the sort that most belongs to plot, that is, that most belongs to action, is the one we have stated; for this sort of recognition-cum-reversal will involve either pity or fear, which are the sorts of actions tragedy has been established to be an imitation of, since both bad luck and good luck will result from things of this sort.

And since recognition is recognition among people, some recognitions are by only one of the two people of the other, when it is clear who the other is. But sometimes there must be recognition on both sides—for example, Iphigenia was recognized by Orestes as a result of her sending the letter, but for him to be recognized by Iphigenia there had to be another recognition.[20]

These, then, are two parts of the plot: reversal and recognition. The third is suffering. Of these, reversal and recognition have been discussed. As for suffering, it is [entailed by] destructive or painful action—for example, deaths that are out in the open,[21] as well as excessive pains, wounds, and things of this sort.

16. Perhaps 1451a12–15.
17. Sophocles, *Oedipus Tyrannus* 911–1085.
18. Of Theodectes.
19. Reading ὥς ὅπερ εἴρηται συμβαίνει.
20. Euripides, *Iphigeneia in Tauris* 727–841.
21. As opposed to concealed or covered up.

12
Prolog, Episode, Choral Part

The parts of tragedy that should be put to use as formal elements have been stated previously. But in terms of quantity, that is, the separate parts into which it is divided, these are as follows: prolog, episode, exit, and choral part, and the latter is divided into choral entry and choral ode. These are common to all tragedies, whereas actors' songs onstage and dirges are special to some.

A prolog (*prologos*) is a whole part of a tragedy, the one that is before the choral entry. An episode (*epeisodion*) is a whole part of a tragedy, the one that is between whole choral melodies. An exit (*exodos*) is a whole part of a tragedy after which there is no choral melody. Of the choral part, the choral entry (*parodos*) is the first whole choral style of speech (*lexis*); a choral ode (*stasimon*) is a choral melody that is without anapests or trochees; and a dirge (*kommos*) is a lament shared between chorus and actors onstage.

The parts of tragedy that must be used as formal elements have been stated previously, while in terms of quantity, the separate parts into which it is divided are these.

13
Guidelines for Plot Construction

What poets must aim at and what they must beware of in composing plots, and from what the work of tragedy will come about, would be the next things to discuss after the ones talked about just now.

Since, then, the composition of the most nobly beautiful tragedy must be not simple, but complex, and moreover it must be the imitation of events that cause fear and pity (for this is special to this sort of imitation), it is clear, first, that decent men must not be shown changing from good luck to bad luck (for this does not cause fear or pity, but is repulsive), nor depraved ones changing from bad luck to good luck; for this is the most unsuited to tragedy of all, since it has nothing of what it must have; for it is neither appealing to our fellow feeling for humans, nor does it cause pity or **1453a1** fear. Nor, again, must it show a thoroughly wicked person falling from good luck into bad luck; for a composition of this sort, though it can include what is appealing to our fellow feeling for humans, involves neither pity nor fear, for pity is felt for the one whose bad luck is undeserved, and fear for a person like ourselves, so that the outcome will cause neither pity nor fear.

There remains, therefore, the person who is intermediate between these. A person of this sort is one who is neither outstanding in virtue and justice, nor does he undergo a change to bad luck because of vice and wickedness, but rather because of some sort of error, and who is one of those people who have a great reputation and

good luck—for example, Oedipus, Thyestes,[22] or other notable men belonging to such families. Necessarily, therefore, a plot shaped in a nobly beautiful way is simple rather than (as some people say) double, and involves a change not from bad luck to good luck, but rather the contrary, from good luck to bad luck, not because of wickedness, but because of a great error committed either by a person of the sort just mentioned, or by a better rather than a worse person.

A sign of this is also what is in fact taking place; for at first poets recounted stories at random, but now the most nobly beautiful tragedies are composed about a few households—for example, about Alcmeon, Oedipus, Orestes, Meleager, Thyestes, Telephus,[23] and those others who happen to have suffered terrible things, or done them.

The tragedy that in accord with the craft of tragedy is most nobly beautiful, then, comes from this sort of composition. And that is why those who criticize Euripides for doing this in his tragedies (namely, that many of them end in bad luck) are making the same error. For that, as was said, is the correct thing. A most important sign of this is that onstage and in competitive performances these tragedies are manifestly the most tragic—provided they are staged successfully. And Euripides, even if he does not manage things well in other respects,[24] is manifestly the most tragic of the poets.

Second in noble beauty, which is said to be first by certain people,[25] is the tragedy that has a double composition like the *Odyssey*, and ends in contrary ways for the better and the worse people. It seems to be first, however, because of the weakness of the spectators; for the poets, in composing plays, follow the wishes of the spectators. But this is not the pleasure of tragedy, but rather belongs more properly to comedy; for there the worst enemies in the story (for example, Orestes and Aegisthus[26]) exit as friends at the end, and no one is killed by anyone.

14
Sources of the Tragic Effect

Now fear and pity can come about from the spectacle, but they can also do so from **1453b1** the structure of events itself, which is precisely a more primary thing and characteristic of a better poet. For the plot must be so structured that, even without seeing them, anyone who hears about the events as they unfold, will shudder and feel pity at

22. As portrayed in Sophocles' lost *Thyestes in Sicyon*, where he unwittingly commits incest with his daughter Pelopia.

23. Alcmaeon and Orestes killed their mothers to avenge their fathers (1253b24, 33); Meleager and Telephus killed their uncles by accident.

24. 1454a29–33, 1454b1, 1454b31–32, 1456a26–27, 1461b20–21.

25. Secluding σύστασις.

26. In tragedy, Orestes, Clytemnestra's son, kills her lover Aegisthus; no extant comedy has them become friends instead.

what happens, which is just what one would feel on hearing the plot of the *Oedipus*. To produce this effect by means of spectacle lies more outside the province of craft and requires lavish expenditure. But those, who by means of spectacle, produce not fear but only what is monstrous, have nothing in common with tragedy; for one must not seek every sort of pleasure from tragedy but only the one proper to it. Since what the poet must produce is the pleasure that comes from pity and fear by means of imitation, it is evident that it must be built into the events.

Of things that happen, let us now get a grasp on what sorts of them are manifestly terrible and what sorts lamentable. It is necessary, then, for actions of these sorts to be of friends in relation to each other, or of enemies, or of neither. If, then, it is enemy in relation to enemy, there is nothing causing pity, either in doing it or being about to do it, except in the suffering itself. Nor is there, if they stand in neither relation. But when the sufferings take place in friendships—for example, when brother kills, or is about to kill brother, or does something else of this sort, or son father, or mother son, or son mother—these are the ones that must be sought out.

One cannot, to be sure, undo the traditional stories (I mean, for example, Clytemnestra's being killed by Orestes or Eriphylus by Alcmeon[27]), but the poet must invent plots for himself and use in a nobly beautiful way the stories that have been handed down.

Let us state more perspicuously what we mean by "in a nobly beautiful way." For it is possible for the action to come about in the way the old poets made it do, that is, in full knowledge and awareness, just as Euripides too made Medea kill the children. But it is also possible for someone to do the action, do the terrible thing while being in ignorance, and then later recognize the friendship, as Sophocles' Oedipus does (this instance is outside the drama, of course, but within the tragedy itself we have, for example, Astydamas' *Alcmaeon* or Telegonus in the *Wounded Odysseus*[28]). And a further third possibility beyond these is to be about to do something irreparable because of ignorance, but to recognize the friendship before doing so. And beyond these cases there are no others. For it is necessary either to do an action or not to do an action, and to do so knowingly or not knowingly.

Of these to be, in full awareness, about to do the action, and not to do it is the worst; for this is repulsive, and not tragic; for there is no suffering. That is precisely why no one composes in this way, except rarely—for example, Haemon against Creon in the *Antigone*.[29] And to do the action in full awareness is second worst. Better is to do the action in ignorance and, having done it, to recognize [the friendship]; for there is nothing repulsive present in it and the recognition causes surprise (*ekplêxis*). But the best one is the last. I mean, for example, the *Cresphontes*,[30] where Merope is about to kill her son, and does not kill him, but rather recognizes him, as did the

27. 1453a20.
28. Perhaps by Sophocles.
29. Sophocles, *Antigone* 1232–1243.
30. Of Euripides.

sister her brother in the *Iphigenia*,[31] and in the *Helle*,[32] where the son was about to hand over his mother [to the enemy], but recognized her.

That is why indeed, precisely as we said just now, tragedies are not about many families. For, seeking not due to craft but due to luck, poets discovered how to produce this sort of effect in their plots. They are compelled, then, to turn to families in which such sufferings have happened.

Where the structure of events is concerned, then, and of what sorts plots should be, enough has been said.

15
Character

Where people's characters are concerned, on the other hand, there are four things the poet must aim at.

First and foremost, they must be worthy.[33] And there will be a character if, as was said,[34] their speech or action reveals a certain deliberate choice, whatever it may be, and a worthy character if their deliberate choice is worthy. And it can exist in each kind of person; for even a woman can be worthy, as can a slave, although presumably the first of these is inferior, and the second wholly low in rank. Second is fittingness; for it is possible for a man to be courageous[35] in character, but it is not fitting for a woman to be courageous or powerful to such a degree. Third is life-likeness. For this is different from making the character worthy or fitting in the way just stated. Fourth is consistency. For even if the person on whom the imitation is modeled is inconsistent, and this sort of character is taken for granted, it must still be consistently inconsistent.

An example of wickedness of character, not required by any necessity, is the Menelaus in *Orestes*;[36] of the unfitting and unsuitable character, the lament of Odysseus in the *Scylla*[37] and the speech of Melanippe;[38] and of the inconsistent character, *Iphigenia in Aulis*; for the supplicating Iphigenia is nothing like the later one.

And likewise in the characters too, just as also in the structure of events, the poet must always seek what is either necessary or likely, so that it is either necessary or likely for this sort of person to say or do these sorts of things, and necessary or likely for this event to come about after that one.

31. 1452ᵇ6–8.
32. Author unknown.
33. 1453ᵃ8–10.
34. 1450ᵇ8–9.
35. Reading ἀνδρεῖον.
36. Of Euripides.
37. Dithyramb by Timotheus.
38. In Euripides' lost *Melanippe the Wise*.

It is evident, then, that the resolutions of plots too must come about from the plot
1454b1 itself, and not from a deus ex machina, as in the *Medea*, and the *Iliad* scene of the launching of the ships.[39] But a deus ex machina must be used for what is outside the drama—either whatever things have happened beforehand and that no human being could possibly know, or whatever ones happen afterward that need to be foretold or
5 announced (for we assign it to the gods to see all things). However, there should be no non-rational element in the structure of events, unless outside the tragedy—for example, that in Sophocles' *Oedipus*.

Since tragedy is an imitation of people better than ourselves, the poet must imitate the good portrait painters. For in fact they, while making them life-like by rendering
10 the individual person's outward shape, paint them as more nobly beautiful. So too the poet in imitating people who are angry, lazy, or have other traits of this sort, must, in the case of their characters, make them of this sort but decent—for example, Homer made Achilles both a good man and a paradigm of harshness.[40]

The poet, then, should observe these rules, and in addition to these he should
15 observe whatever is a result of the perceptions that of necessity follow along with the craft of poetry; for in fact it is possible often to err with respect to these. But enough has been said about these in my published accounts.[41]

16
Forms of Recognition

What recognition is was stated previously.[42] As for the forms of recognition, the first is the one which is most outside the province of craft and which poets make
20 most use of through lack of resourcefulness, namely, recognition by means of signs. Of these, some are congenital birthmarks—for example, "the spearhead-shaped one that the earthborn bear,"[43] or those in the shape of stars like the ones Carcinus uses in his *Thyestes*. Others, though, are acquired. And of these, some are on the body—for example, scars; others are external—for example, necklaces, or the recognition because of the boat in the *Tyro*.[44]

25 But it is possible to put these too to better or worse use—for example, Odysseus was recognized in one way by the nurse and in another by the swineherds;[45] for the recognitions done for the sake of persuasion, that is, all recognitions of this sort, are

39. Homer, *Iliad* 2.109–210.
40. Reading παράδειγμα σκληρότητος post ἀγαθὸν καὶ.
41. Possibly the lost dialog *On Poets*.
42. 1452a29–32.
43. Possibly from Euripides' lost *Antigone*.
44. Of Euripides. Tyro's two sons were set adrift in a boat, which Tyro recognized later on.
45. Homer, *Odyssey* 19.386–475, 21.205–225.

more outside the province of craft, whereas those that result from a reversal, like that in the Bath Scene, are better.

Second are those made up by the poet, this being why they are outside the province of craft. For example, how Orestes in the *Iphigenia* makes it known that he is Orestes;[46] for Iphigenia is recognized by means of the letter, whereas he himself says what the poet wishes, but not what the plot does. That is why it is something close to the error mentioned, for he too might have brought recognizable things with him. Also, the voice of the shuttle in Sophocles' *Tereus*.[47]

Third is by means of a memory, when someone reacts to seeing something, as in Dicaeogenes' *Cypriots* (for on seeing the painting, the protagonist bursts into tears), or as in the *Tale to Alcinous*[48] (for on hearing the lyre player and remembering, Odysseus weeps), as a result of which they were recognized.

Fourth is recognition based on a deduction—for example, in the *Libation Bearers*:[49] someone similar to me [Electra] has come; but there is no one similar to me except Orestes; therefore it is he who has come. Or the sophist Polyidus' recognition concerning Iphigenia; for it would be likely, he said, for Orestes to deduce that his sister was sacrificed, and so it falls to him to be sacrificed too. Or in Theodectes' *Tydeus*: having come in order to find his son, he is to die himself. Or the recognition in the *Sons of Phineus*;[50] for when the women saw the place, they deduced their fate, namely, that they were fated to die there; for in fact it is where they were exposed as infants.

There is also a combined sort of recognition resulting from a fallacious inference by the audience—for example, in *Odysseus the False Messenger*;[51] for the fact that he, and no one else, could bend the bow is made up by the poet and is a premise, as indeed is [Odysseus'] saying that he would recognize the bow that he had not seen. But to suppose him to be recognized by means of this involves a fallacious inference.[52]

The best of all recognitions is the one resulting from the events themselves, when the surprise comes about by means of likelihoods—for example, in Sophocles' *Oedipus* and the *Iphigenia*; for there it is likely that Iphigenia would wish to send a letter. For only recognitions of this sort are without made-up signs and necklaces. Second best are those that result from deductions.

46. Euripides, *Iphigenia in Tauris* 727–841.
47. Tereus raped Philomela and cut out her tongue to silence her; but a tapestry she wove on her loom revealed what he had done.
48. Homer, *Odyssey* 8.521–586.
49. Aeschylus, 168–234.
50. Perhaps of Sophocles.
51. Author unknown.
52. The text is uncertain. The idea seems to be this. The poet tells us that Odysseus alone can bend the bow, which is true. Therefore, his doing so would allow him to be recognized. In fact, however, he is recognized in the play by his knowing that the bow is his when he sees it. But that involves a false inference, since many people know that the bow is his.

17
Setting before the Eyes, Stories, Gestures, Episodes

In constructing plots and elaborating them by the style of speech, the poet must set things before the eyes as much as possible; for in this way, seeing them most vividly, as if he were actually present at the actions, he can find what is fitting and is least likely to overlook things that are contrary to each other. A sign of this is the criticism leveled against Carcinus. For his Amphiaraus was returning from a sanctuary, which the poet,[53] not visualizing it, failed to notice, and the play failed onstage because the spectators were annoyed at it.

As far as possible the poet must also elaborate his plots with gestures; for the ones who are most convincing are those who, from the same nature [as ourselves], are inside the feelings, and the one who feels distress most truly distresses us, and the one who feels anger most truly angers us. That is why the craft of poetry is for the naturally clever rather than for the manic person;[54] for the former are versatile, while the latter are excitable.

As for stories, both those that are ready-made and those he makes up, he must set them out in universal terms[55] while he is composing them, and then in this way work out the episodes and extend them. I mean that he might get a theoretical grasp on the universal in the following way, for example, in the story of Iphigenia: "A certain girl, having been offered as a sacrifice, disappears in a way that is unclear to those who sacrificed her, and is set down in another country, where it was the custom to sacrifice strangers to the goddess, whose priesthood the girl came to hold. Some time later the priestess' brother happens to arrive (the fact that god's oracle ordered him to go due to a certain cause is outside the universal,[56] and for what purpose he went, is outside the plot), and, having arrived and been captured, is about to be sacrificed by his sister, when he makes himself recognized (either in the way Euripides made him do it or in the way Polyidus did[57]) by saying, as would be likely, that it was not only his sister's fate to be sacrificed, therefore, but also his own. And from that comes his rescue." After this point the poet must supply names and work out episodes; and in such a way that the episodes will properly belong [to the plot]—for example, in the case of Orestes, the madness through which he was captured, and his rescue through purgation.

In dramas the episodes are short, whereas epic is lengthened out with them. For the story of the *Odyssey* is not long: "Someone has been away from home for many years, guarded against returning by Poseidon, and alone. Further, things at home are such that his wealth is being consumed by his wife's suitors, his son plotted against.

53. Reading τὸν ποιητὴν.
54. Reading μᾶλλον ἢ μανικοῦ.
55. 1451b8–10.
56. Reading ἔξω τοῦ καθόλου post ἐκεῖ.
57. 1455a6.

He arrives home after much distress, makes himself recognized by certain people, launches an attack, and he himself survives while he destroys his enemies." This is what is special to it; the other things are episodes.

18
Complication, Wonder, Chorus

In every tragedy there is a complication and a resolution. Things outside it, and often some of the things inside it, are the complication, the rest is the resolution. By "complication (*desis*)" I mean what goes from the start up to the part that is the last [point] from which there is a change either to good luck or to bad luck, while by "resolution (*lusis*)" I mean the part from the start of the change of luck up to the end. For example, in Theodectes' *Lynceus*, the preceding actions, the capture of the baby, and then [the parents'] accusation[58] is the complication, whereas from the accusation of murder up to the end is the resolution.

There are four forms of tragedy (the same number, in fact, has been mentioned also for the parts): the complex form, the whole of which consists in reversal and recognition; the tragedy of suffering—for example, the ones about Ajax[59] or Ixion; the tragedy expressive of character—for example, the *Women of Phthia* and the *Peleus*;[60] the fourth **1456ᵃ1** is [mere] spectacle[61]—for example, the *Daughters of Phorcys*,[62] the *Prometheus*,[63] and those set in Hades.

Now preferably the poet must try to include all these, otherwise, the most important ones and as many as possible, especially given the way people criticize poets nowadays; for because for each part there have been poets good at it, they expect a single poet to surpass the special good of each of them. But it is right to say that one tragedy is different from, or the same as, another by reference to nothing other than its plot, that is, whether they have the same complication (*plokê*) and resolution. Many poets complicate well, but resolve badly; but both must be coordinated.

It is necessary for poets to remember, though, precisely what was said many times,[64] not to compose a tragedy with an epic structure (by "epic" I mean many-plotted)—for example, if someone were to make a tragedy out of the whole of the *Iliad*'s plot. For there, because of its length, the parts take on the fitting magnitude, whereas in dramas what results is very much contrary to what is supposed. A sign of this is that

58. Reading ἡ αὐτῶν αἰτίασις.
59. By Sophocles, Carcinus, Theodectes, and others.
60. Both perhaps by Sophocles.
61. Reading ὄψις.
62. Either the Gorgons or the women who guarded them.
63. Of the Promethean trilogy of Aeschylus, only *Prometheus Bound* is extant.
64. Perhaps 1455ᵇ15–23.

those who composed a sack of Troy as a whole, and not in part, as Euripides did,[65] or the whole of Niobe's story,[66] and not like Aeschylus [a part], either fail or do badly in competitions, since in this alone even Agathon failed.

In reversals and in simple actions, poets aim to achieve the effects they wish by using wonder; for this is tragic and is appealing to our fellow feeling for humans. This is possible when someone who is wise but wicked is deceived, like Sisyphus, or when someone who is courageous but unjust is defeated. And this is even likely, as Agathon says, for it is likely that many things happen even contrary to likelihood.

The poet should take the chorus too to be one of the actors, and to be a part of the whole and to join in the action, not as in Euripides but as in Sophocles. As for the rest of the poets, the singing parts no more belong to their plot than to any other tragedy. That is why they sing interludes (*embolima*)—a sort of practice first started by Agathon. Yet how does singing interludes differ from fitting a speech, or a whole episode, from one drama into another?

19
Thought and Style of Speech

We have now discussed the other formal elements. It remains to discuss style of speech and thought.

As for thought, let what was said about it in the *Rhetoric*[67] be assumed; for it is special rather to that methodical inquiry. The things referred to thought are those that have to be produced through speech. And of these the parts are demonstration and refutation; the production of feelings (for example, pity, fear, anger, and others of this sort); and further, importance and unimportance. In the events too it is clear that the poet must use some of the same formal elements when he needs to make things piteous or fearful, important or likely, except that there is this much difference, namely, that in the latter case things must be evident without instruction, while in the former case things must be produced in the speech by the speaker and based on the speech. For what would be the work of the speaker if the things he needs to say are evident even not through speech?

Where style of speech is concerned, one form of theoretical investigation is concerned with the modes of expression, knowing which belongs to the craft of delivery and to the person who possesses this sort of craft in its architectonic variety—for example, knowing what a command is, a prayer, a narration, a threat, a question, an answer, and anything else of this sort. But no criticism at all that is based on

65. In *Trojan Women* and *Hecuba*.
66. A puzzling reference, since no epic recounts her story, according to which her proud boast about the superiority of her fourteen children to Leto's two, Apollo and Artemis, led to their death at the latter's hands.
67. 1403a35–b1.

knowledge or ignorance of these things is worth taking seriously. For why would anyone take as an error the things Protagoras criticizes, namely, that Homer, while thinking he is expressing a prayer, is giving an order, since he says, "Sing, goddess, of the anger"? For bidding someone to do or not to do something, Protagoras says, is an order. Hence one must leave aside this theoretical knowledge as belonging to another craft and not to that of poetry.

20
Parts of Speech

Of speech (*lexis*) in its entirety the parts are these: element, syllable, connecting particle, conjunction,[68] name, verb, inflection, statement.

An element is an indivisible voiced sound, and not every one, but one from which a compound sound naturally comes about; for wild beasts too have indivisible voiced sounds, but none of those are what I mean by an "element." Of this voiced sound the parts are vowels, semivowels, and mutes. A vowel is what has an audible voiced sound produced without any application [of the tongue]; a semivowel is what has an audible voiced sound produced with an application (for example, *sigma* and *rho*); and a mute is what, produced with an application, has no audible sound by itself, but becomes audible when combined with an element that has sound (for example, *gamma* and *delta*).

Elements differ in the shapes the mouth takes, but also in the places [from which they are produced], in the presence or absence of aspiration, in being long or short, and in having acute, grave, or intermediate pitch. Theoretical knowledge about each of these properly belongs to the craft of versification.

A syllable (*sullabê*) is a non-significant voiced sound composed of a mute and a voiced element; for in fact *gamma rho* is a syllable[69] without an *alpha* and also with an *alpha*, *gamma rho alpha*. But, again, theoretical knowledge of these differences belongs to the craft of versification.

A connecting particle (*sundesmos*) is a non-significant voiced sound that neither prevents nor causes the production of a single significant voiced sound from several voiced sounds, [and is naturally placed either at the extremities or in the middle,] **1457ª1** which it is not fitting to place by itself at the start of an account—for example, *men*, *dê*, *toi*,[70] *de*. Alternatively, it is a non-significant voiced sound that from more than one voiced but significant sounds naturally produces a single significant voiced sound. {For example, "about," "concerning," and the rest.}[71]

68. Reading ἄρθρον before ὄνομα rather than after ῥῆμα.
69. Reading συλλαβὴ καὶ.
70. These particles convey nuances that are captured in English in different ways in different contexts. Reading δή τοί.
71. Transposed from 1457ª7–8.

An *arthron*[72] is a non-significant voiced sound that makes clear the start of a statement, its end, or its division.[73]

A name (*onoma*) is a composite significant voiced sound, without a reference to time, no part of which is significant by itself; for in double names we do not use any part as significant by itself—for example, in "Theodorus," "dorus" is not significant.

A verb (*hrêma*) is a composite significant voiced sound, involving a reference to time, no part of which is significant by itself, just as in the case of names; for "human being" or "white" does not signify a time, whereas "walks" or "walked" additionally signify, in the one case, the present time, in the other, the past.

An inflection (*ptôsis*) of a name or verb is either with regard to the part that signifies case—*of* him [genitive], *for* him [dative], and things of that sort; or with regard to the part that signifies number (for example, human *beings*, or human *being*); or with regard to the sorts of delivery (for example, a question, a command); for "Did he walk (*ebadisen*)?" or "Walk! (*badize*)" is an inflection of the verb with respect to these forms.

A statement is a composite significant voiced sound, some parts of which are significant by themselves; for not every statement is composed of verbs and names—for example, the definition of human being [as featherless biped animal].[74] On the contrary, it is possible for there to be a statement without verbs. However, a statement will always have a part that signifies something—for example, "Cleon" in "Cleon walks." And a statement is one statement in two ways: either by signifying one thing or by consisting of several things through conjunction—for example, the *Iliad* is one through conjunction, whereas that [giving the definition] of human being is so by signifying one thing.

21
Forms of Names (Nouns)

Of the forms of names, some are simple (by "simple" I mean not composed of parts that are significant—for example, "earth"), others double. Of the latter, one is composed of a significant part and a non-significant part, except that within the name these are not significant and non-significant; the other is composed of parts that are significant. There can also be triple, quadruple, even multiplex names—for example, many amplified names,[75] such as *Hermokaikoxanthos*.[76]

1457b1 Every name, however, is either prevalent, exotic, a metaphor, an ornament, made-up, lengthened, shortened, or altered.

72. It is unclear which part of speech Aristotle is defining. Later the term meant "article."
73. Omitting ἢ φωνὴ . . . μέσου.
74. *Int.* 17a11–12.
75. Reading μεγαλειωτῶν.
76. Perhaps the fusion of the names of three rivers.

By a "prevalent" name I mean one a given group would use, and by an "exotic" name one that other groups would. So it is evident that the same name can be both prevalent and exotic, although not for the same people; for *sigunon* ("spear") is prevalent for the Cypriots, but exotic for us.

A metaphor is the application to something of a name belonging to something else, either from kind to form, from form to kind, from form to form, or by analogy. By "from kind to form" I mean, for example, "here stands my ship";[77] for being moored is a sort of standing. By "from form to kind" I mean, for example, "Odysseus in truth did ten thousand noble deeds";[78] for ten thousand is many, and Homer uses it here instead of "many." By "from form to form" I mean, for example, "having drained out his soul with bronze" and "having cut with long-edged bronze"[79] [a bowl to drain out water]; for here the poet calls cutting "draining" and draining "cutting"; for both are a sort of removal.

By "analogy" I mean when the second is to the first as the fourth is to the third [b : a :: d : c]. For the poet will say the fourth [d] in place of the second [b], or the second [b] in place of the fourth [d]. Sometimes too poets add something that is related to the substituted term. I mean, for example, that the wine-saucer is related to Dionysus as the shield is to Ares. And therefore a poet will say that a wine-saucer is "the shield of Dionysius" and a shield "the wine-saucer of Ares."[80] Or as old age is related to life, so the evening is related to day. And therefore a poet will say that evening is "the old age of day"[81] (or as Empedocles does), or call old age "the evening of life,"[82] or "the sunset of life."[83]

In some cases, there is no established name for one of the terms of the analogy, but nonetheless they will be expressed in the same way. For example, to let go of seed is to "sow" it, whereas to let go from the fire of the sun is nameless. But it stands in the same relation to the sun as sowing does to the seed. That is why the poet says "sowing the god-created fire."[84] It is possible to use this mode of metaphor also in another way: having called something by a name that belongs to something else, to deny something that properly belongs to it—for example, if a poet said not that a shield is a "wine-saucer of Ares," but a "wineless wine-saucer."

{. . .}[85]

77. Homer, *Odyssey* 1.185, 24.308.
78. *Iliad* 2.272.
79. Empedocles B138, B143 DK.
80. Timotheus, Fr. 21 Page.
81. B152 DK.
82. Alexis, Fr. 228 Kock.
83. Plato, *Laws* 770a.
84. Source unknown.
85. There is a lacuna in the text at this point, perhaps to be filled with a definition of ornament.

A made-up name is one that, being wholly unused by anyone, is given by the poet himself, for it seems that there are some names of this sort—for example, "sprouters" for horns, and "prayer-man" for priest.

As for lengthened or shortened names, the former is one that uses a longer vowel than the one properly belonging to it, or an inserted syllable. A name is shortened if something is removed from it. A lengthened one, for example, is *polḗos* for *polḗos* ("of a city"), and *Pêlḗiadeô* for *Pêlḗidou* ("son of Peleus"); a shortened one is, for example, *kri* [for *krithê*] ("barley"), *dô* [for *dôma*] ("house"), and [*ops* for *opsis*] in "from a pair of eyes a single vision (*ops*) comes."[86]

An altered name is when the poet leaves part of the thing doing the naming as it is but makes up some of it—for example, [*dexiteron* ("rightward")] for *dexion* ("right") in "by her rightward (*dexiteron*) breast."[87]

Of names themselves, some are masculine, some feminine, some neuter. Masculine names are those that end in *nu*, *rho*, or *sigma*, and in those letters composed with *sigma* (there are two of those: *psi* and *xi*). Feminine names are those that end in the vowels that are always long, that is, in *êta* or *ômega*, or, of those that can be lengthened, in *alpha*. So it turns out that there is an equal number of letters for masculine and feminine names to end in; for *ps* and *ks* are composites [of *sigma*]. No name ends in a mute or in a vowel that is [always] short. And in *iota*, only three end—*meli* ("honey"), *kommi* ("gum"), and *peperi* ("pepper")—and in *upsilon*, five—*pôu* ("fleece"), *napu* ("mustard"), *doru* ("spear"), *gonu* ("knee"), and *astu* ("town").[88] Neuter nouns, for their part, end in the same ones, and in *alpha*, *nu*, *rho*,[89] and *sigma*.

22
Virtue of Style of Speech

Virtue of style of speech consists in being perspicuous and not low. And the most perspicuous is that composed of prevalent names; but it is low. An example is the poetry of Cleophon, and of Sthenelus. On the other hand, a style that makes use of unfamiliar names is dignified and removed from the prosaic. By "unfamiliar" I mean exotic, metaphor, lengthening, and everything that is contrary to what is prevalent. But if someone were to make all the names be of this sort, the result will be either a riddle or gibberish: if composed of metaphors, a riddle; if of exotic names, gibberish. For the very form of a riddle is to combine impossibilities in stating things that are the case. This cannot be done with a combination of the other sorts of names, but is possible with a combination of metaphors—for example, "I saw a man gluing bronze

86. Empedocles, B88 DK.
87. Homer, *Iliad* 5.393.
88. Reading τὸ πῶυ τὸ νᾶπυ τὸ γόνυ τὸ δόρυ τὸ ἄστυ.
89. Reading καὶ α . . . καὶ ρ.

onto a man using fire,"[90] and others of the same sort. But things composed of exotic names are gibberish. The style of speech, therefore, must be somehow a mix of these; for the first—for example, exotic name, metaphor, ornament, and the other forms mentioned—will produce what is not prosaic and not low either, while the prevalent name will produce perspicuousness.

In no small part the lengthenings, abbreviations, and alterations of names contribute to perspicuousness and non-prosaicness; for, because of their variation from what is prevalent, since they are contrary to what is customary, they will produce what is non-prosaic, but because of their share in what is customary, they will produce perspicuousness. So it is not correct to criticize this mode of speaking and ridicule the poet[91] for it, as some have done, for example, the elder Eucleides, on the supposition that it is easy to produce poetry if one is allowed to lengthen names as much as one wishes, composed as lampoons in such a style of speech, "I saw Epichares walking Marathon-ward (*Marathônade*)" [for "I saw Epichares walking to Marathon"] and "not stirring up his hellebore (*ellêbôron*)."[92] Using this mode in an obvious way, then, is ridiculous. Moderation is a common requisite of all the parts; for in fact a poet would also produce the same result by using metaphors, exotic names, and the other forms in an unfitting way and to deliberately produce what is ridiculous. **1458^{b}1**

How much difference what is fitting makes in the case of epic poems is to be seen by putting [prevalent] names into the verse. And in the case of exotic names, metaphors, and the other forms, if one were to substitute the prevalent names [for them], one would see that what we are saying is true. For example, when Euripides composed the same iambic verse as Aeschylus, substituting only one name, an exotic one, in place of a customary prevalent one, it is evident that the one verse is nobly beautiful, the other shabby. For while Aeschylus in his *Philoctetes* wrote "the cancer that eats the flesh of my foot,"[93] Euripides substituted "feasts on" for "eats."[94] Also, in "now I am a paltry man, niddering, and unseemly,"[95] if someone substituted the prevalent names and wrote, "now I am a little man, weak, and ugly." And "offering a misshapen stool and a paltry table"[96] versus "offering a bad stool and a little table." Or "the shores resound" versus "the shores scream."[97]

Further, Ariphrades ridiculed the tragedians because they used things which no one would say in speaking—for example, "from the house away" instead of "away

90. *Rh*. 1405^{b}1–5.
91. Homer.
92. Reading Ἠιχάρην, ἐλλήβωρον. Though the text is corrupt, if *ellêbôron* is a comic expansion of *eleos* ("pity"), the joke may have had a particular appeal for Aristotle, since hellebore is thought to have been used as an agent of purgation.
93. Fr. 253 Nauck.
94. Fr. 762 Nauck.
95. Homer, *Odyssey* 9.515.
96. Homer, *Odyssey* 20.259.
97. Homer, *Iliad* 17.265.

from the house," or "of thine," "mine own,"[98] or "Achilles round" instead of "around
1459a1 Achilles," and all other things of this sort. But it is because in fact such expressions are not among the prevalent ones that they produce what is not prosaic in the style of speech. But Ariphrades was ignorant of this.

But while it is important that each of the things mentioned be used in a fitting way, including double names and exotic ones, to be skilled with metaphors is by far the most important. For it alone cannot be acquired from anyone else and is a sign of good natural cleverness; for to use metaphors well is to see likeness.

Of names, double ones are most fitting for dithyrambs, exotic ones for heroic verses, and metaphors for iambic verses. In fact, in heroic verses all the things just mentioned are useful, whereas in iambic ones, because these most of all imitate speech, those names are fitting that one can use in prose speeches too. And prevalent name, metaphor, and ornament are things of this sort.

Where tragedy is concerned, and imitation in the medium of acting, then, let what has been said be enough for us.

23
Epic: Plot

Where the craft of narration and imitation in the medium of verse is concerned, on the other hand, it is clear that, just as in tragedies, the poet should compose plots that are dramatic (that is, about one unified action that is whole and complete, having a starting-point, middle points, and end), in order that, like one unified and whole animal, it may produce the pleasure proper to it, and not compositions that are like histories, in which it is necessary not to exhibit a single unified action, but rather a single time, with all that happened during it to one person or to several people, each event having a random relation to the others. For just as at the same time as the sea battle at Salamis happened, the battle against the Carthaginians in Sicily also happened, but did not contribute anything to the same end, so too in successive times one thing sometimes comes about after another, though from these no single end comes about.

Pretty much all of the poets, however, do this. That is why, as we said already,[99] Homer appears divinely inspired compared to the others, in that he did not attempt to make a poem of the war as a whole, although it had a starting-point and an end; for the plot would have been too long and not easily seen as a whole, or, if moderated in length, too complex in its variety. But as things stand, selecting a single part, he has used many parts as episodes, for example, the catalog of ships and other episodes, with which[100] he diversifies his poem. The other poets compose their poems about a

98. Sophocles, *Oedipus at Colonus* 986.
99. 1451a23–24.
100. Reading οἷς.

single person, a single time, or a single multipart action—for example, the one[101] who composed the *Cypria* and the *Little Iliad*. Accordingly, from each of the *Iliad* and the *Odyssey*, only one or at most two tragedies are made, whereas many are made from the *Cypria*, and more than eight from the *Little Iliad*—for example, the *Judgment of Arms*, *Philoctetes*, *Neoptolemus*, *Eurypylus*, *Beggary*, *Spartan Women*, *Sack of Troy, Departure of the Ships*, *Sinon,* and *Trojan Women*.[102] **1459ᵇ1** 5

24
Epic and Tragedy Compared, Homer

Further, epic must include the same forms as tragedy, for it is either simple or complex, expressive of character or full of suffering. And its parts, except for melody-composition and spectacle, are the same; for, in fact, it needs reversals, recognitions, and sufferings. Further, the thoughts and the style of speech must be nobly beautiful. 10

Homer was both the first to use all these and to do so in a fully adequate way. For in fact of his two poems each is composed in each of the two ways[103]—the *Iliad* is simple and full of suffering, while the *Odyssey* is complex (in fact, recognition permeates it) and expressive of character. In addition to this, Homer has surpassed everyone[104] in style of speech and thought. 15

Epic differs, though, with respect to the length of its composition and in its meter.

Now, of its length, the limit we stated[105] is adequate; for it must be possible for both the starting-point and the end to be within the range of one's vision. And this would be so if the compositions were shorter in length than the old epics, but were to extend to the length of the series of tragedies presented for a single hearing. In relation to the considerable extension of its length, however, epic has a special affection, due to the fact that in tragedy it is not possible to imitate many parts [of the plot] as being done in action at the same time, but only the part performed on the stage and by the actors. In epic, by contrast, because it is narration, it is possible to compose many parts that are accomplished at the same time, and due to these, provided they properly belong in it, the weightiness of the poem is increased. So epic has this advantage when it comes to magnificence, change for the listener, and interspersing 20 25

101. Unknown.

102. *Judgment of Arms* is by Aeschylus; *Philoctetes* by Sophocles and (not extant) by Euripides; *Neoptolemus* by Nicomachus; *Eurypylus*, *Spartan Women*, and *Sinon* (the person left behind by the Greeks to persuade the Trojans to accept the Trojan Horse) by Sophocles; the topic of *Beggary* (not extant) is Odysseus disguised as a beggar; and *Trojan Women* by Euripides. Reading πλέον ἢ ὀκτώ . . . Τρῳάδες.

103. Reading ἑκάτερον <ἑκατέρως>.

104. Reading πάντας.

105. 1451ᵃ9–15.

dissimilar episodes; for similarity, by quickly satiating [the spectator], makes tragedies fail [when staged].

As for its meter, from experience the heroic one has been found fitting. For if anyone were to compose a narrative imitation in one or more of the other meters, it would be manifestly unfitting; for heroic verse is the most stately and most weighty of the meters. That is why it is most receptive of exotic names and metaphors; for narrative imitation also exceeds the others also in this.[106] Iambic [trimeter] and [trochaic] tetrameter, on the other hand, are suited to movement, the second to dancing,[107] the first to action. It would be yet stranger if someone mixed them, as Chaeremon did. That is why no one has composed a long composition in any meter other than the heroic. But, as we said,[108] the nature itself [of epic] teaches poets to choose what is fitting for it.

Homer deserves to be praised for many things, and especially because, among the [epic] poets, he alone is not ignorant of what the poet must do. For the poet himself must say as little as possible; for it is not in virtue of this that he imitates. The others contend for the prize themselves throughout the poem, but imitate little and seldom. But Homer, after a short preamble, brings on a man, a woman, or something else,[109] and none of them characterless, but all of them possessing character.

In tragedies, the poet should produce the element of wonder, but in epic the non-rational, through which the element of wonder results par excellence, is more possible, because one does not look at the person doing the action. For the events pertaining to the pursuit of Hector would appear ridiculous on the stage, with the Greeks standing still and not pursuing him, and Achilles forbidding them to do so, but in the epic they are unnoticed. The element of wonder, though, is pleasant. A sign of this is that everyone exaggerates when they narrate a story, supposing that they make themselves agreeable.

Also, Homer above all taught the other poets to speak falsehoods as they should. This is by fallacious inference. For, if whenever A is or comes to be, B is or comes to be, people think that if B is, A is or comes to be. But this is false. That is why, if A is false, but if A is or comes to be, necessarily B is or comes to be, the poet should add B. For because we know that B is true, our soul fallaciously infers that A is too. A paradigm case of this is the Bath Scene.[110]

Also, one must deliberately choose likely impossibilities in preference to unpersuasive possibilities, and stories must not be composed of non-rational parts—or rather to the greatest possible extent they should contain nothing non-rational. Or, failing that, it must be outside the frame of the plot, like Oedipus not knowing how Laius died. But it must not be in the drama, like the people reporting on the Pythian

106. Reading καὶ ταύτῃ.
107. 1449ᵃ22–23. Also *Rh.* 1409ᵃ1.
108. 1459ᵇ32.
109. Secluding ἢ ἦθος.
110. Homer, *Odyssey* 19.386–475.

Games in the *Electra*,[111] or the non-speaking man who comes from Tegea to Mysia in the *Mysians*.[112] So, to say that the plot would otherwise have been ruined is ridiculous; for plots of this sort must not be composed to start with. But if one is posited, and appears comparatively reasonable, even something absurd must be admissible,[113] since even the non-rational bits in the *Odyssey* about the putting ashore of Odysseus[114] would clearly be intolerable if an inferior poet had composed them. But as things stand, Homer hides the absurdity by embellishing it with the other good things.

But the poet must take special pains with the style of speech in the idle parts, that is, the ones expressive neither of character nor of thought; for, contrariwise, a too brilliant style of speech obscures both characters and thoughts.

25
Epic: Errors and Problems

Where problems and their resolutions are concerned, it should become evident how many there are and of what form, if we get a theoretical grasp on them as follows.

For since the poet is engaged in imitation, like the painter or any other maker of images, it is necessary that he always be imitating one of three things: things as they were or are; things as they are said to be or seem; or things as they should be.

He expresses these things by means of a style of speech in which there are exotic names, metaphors, and many modifications of speech; for we grant these things to poets.

In addition to this, there is not the same [standard of] correctness in the craft of politics as in that of poetry, nor in any other craft as in poetry. And in the craft of poetry itself error is of two sorts: intrinsic error and coincidental error. For if the poet deliberately choses to imitate correctly, but has erred due to incapacity,[115] the error is intrinsic to the craft itself. But if he deliberately chose to imitate incorrectly, and he represented the horse with both right legs thrown out in front at the same time, and either he made an error in the relevant craft (for example, in medicine or another craft of whatever sort) or he has made something impossible,[116] the error is not in the craft of poetry itself.

So one must resolve the criticisms contained in the problems by investigating them on the basis of these considerations.

First, then, the ones raised against the craft itself. Impossibilities have been produced: an error was committed. But this is correctly done if it attains the end of

111. Sophocles, *Electra* 660–763.
112. Perhaps by Aeschylus.
113. Reading ἄν δὲ . . . ἄτοπον.
114. 13.116–125.
115. Reading ὀρθῶς, ἥμαρτε δὲ δι'.
116. Reading ἢ ἀδύνατα πεποίηται.

the craft itself (for the end has been stated), namely, if in this way it makes this part or another part more surprising. An example is the pursuit of Hector. If, however, the end either could have been better obtained, or no less obtained, in accord with the craft concerned with these matters, to commit the error is not correct;[117] for, if possible, no errors at all should be made.

Further, of what sort is the error, the sort in accord with the craft or in accord with something else and coincidental? For the error is less if the artist did not know that a female deer has no horns, than if he painted non-imitatively.

In addition to these points, if the poet is criticized because he is imitating things that are not true, perhaps [the answer is that] it is as they should be, as, for example, Sophocles said that he made people as they should be, Euripides as they are. This is the way in which the criticism must be resolved.

But if neither of these ways works, then [try] the fact that people say so—for example, the [stories] about the gods. For perhaps these are neither better said this way nor true, but perhaps as they seemed to Xenophanes;[118] however, people do tell them.

1461ᵃ1 And some things, though perhaps not better, were once this way—for example, the ones having to do with weapons: "their spears upright on their butt-spikes";[119] for this was the custom, then, as it is even nowadays among the Illyrians.

As for whether something is said or done nobly or not nobly, one must investigate not only the thing itself that was done in action or said, looking to see whether it is excellent or base, but also the person doing the action or saying it, and to whom, when, by what means, and for the sake of what—for example, for the sake of a greater good, in order to be brought about, or for the sake of a greater evil, in order that it be averted.

Some problems must be resolved by looking to the style of speech—for example, to an exotic name in "the *ourêas* first";[120] for perhaps by *oureus* Homer means not mules but guards.[121] And by Dolon "who was in form bad,"[122] not that his body was ill-proportioned, but that his face was ugly, for Cretans call one who is fair of face "well-formed"). And by "mix it purer,"[123] not serve undiluted wine, as for drunkards, but mix it faster.

Some problems must be resolved by appeal to metaphor—for example, "Everyone, both gods and men, slept all night long," when at the same time he says, "He would

117. Reading ἡμαρτῆσθαι.
118. B14–16, 34 DK. I.e., false.
119. Homer, *Iliad* 10.152.
120. Homer, *Iliad* 1.50.
121. Homeric *oureús* may be either an Ionic form of *oreús* meaning "mule" or of *horeús* meaning "guard."
122. *Iliad* 10.316.
123. *Iliad* 9.202.

gaze across the Trojan plain, wondering at the din of pipes and panpipes";[124] for "all" is said metaphorically in place of "many," for all is a sort of many. And "alone has no share"[125] is metaphorical; for what is best known is alone.

Some problems must be resolved by appeal to accentuation, as Hippias of Thasos[126] resolved, "we grant (*dídomen*) him the fulfillment of his prayer" [by reading *didómen* ("let the dream grant his prayer")][127] and ["this is not (*ou*) rotted by the rain," by reading] "this part of it (*hou*) is rotted by the rain."[128]

Some by punctuation—for example, Empedocles,[129] "and suddenly grew mortal those learned before to be immortal and pure unmixed before" [by reading "and suddenly become mortal, those learned before to be immortal, and pure, unmixed before"].

Some problems must be resolved by ambiguity—"more night had passed."[130] "More" is ambiguous [between "more than a certain part" and "the greater part"].

Some problems must be resolved by habit in style of speech. As people speak of water mixed with wine as "wine," so Homer composed "a greave of new-wrought tin,"[131] and as they speak of iron workers as "bronze-smiths," so he speaks of Ganymede as "the wine-pourer of Zeus," though gods do not drink wine [but nectar]. But this could also be a metaphor.

Whenever a name seems to signify something contradictory, one must also look to see how many ways it might signify in the passage—for example, "the bronze spear was stopped there," one must look to see how many ways it was possible for it to be prevented [from piercing Achilles' shield], this way or that way, so that one would best understand it. This flies straight in the face of what Glaucon describes by saying that some people non-rationally pre-assume something and, coming to a determination of it themselves, deduce the consequence, and criticize the poet (as if he had said the thing that seems so to them) if he contradicts what they think. This is what happened in the case of Icarius. For people think that he is a Spartan. [They deduce,] then, that it was strange that Telemachus did not meet him when he went to Sparta. But perhaps it is as the inhabitants of Cephalonia say; for they say that Odysseus took a wife from among them, and that her father was Icadius, not Icarius. And it is likely[132] that the problem is due to this error.

124. *Iliad* 10.1 (confused with 2.1), 10.11–13.
125. *Iliad* 18.489 (= *Odyssey* 5.275), with reference to the never-setting Ursa Major.
126. Identity uncertain.
127. The passage about Agamemnon's dream is *Iliad* 2.1–34, but the words quoted are spoken by Poseidon at 21.297. If one reads *dídomen*, Zeus himself has given a false promise.
128. Homer, *Iliad* 23.328. People thought it strange that Homer would point out that an oak or pine stump was not rotted.
129. B35 DK.
130. Homer, *Iliad* 10.252–253: "More night had passed, two thirds, but a third is still left."
131. *Iliad* 21.592. Bronze is roughly 10 percent tin and 90 percent copper.
132. Reading εἰκὸς ἐστιν.

In general, the impossibility must be referred either to poetic composition, to the better, or to belief. In relation to composition, a convincing impossibility is more choiceworthy than an unconvincing possibility. And perhaps[133] people of the sort Zeuxis painted are impossible. But it is to the better; for paradigms must be superior.

Non-rational things, on the other hand, must be referred to what people say, or by showing that sometimes they are not non-rational; for it is likely that things will happen even contrary to likelihood.

One must investigate things said in contradictory ways just like refutations in arguments, to see whether the same thing is said in relation to the same thing and in the same way, so that they must be resolved[134] either by reference to what the poet himself says, or to what a practically wise person would assume.

Criticism both of non-rational things and of depraved ones is correct when, with no necessity whatsoever to do so, the poet uses what is non-rational, as Euripides uses Aegeus,[135] or wickedness, as Euripides uses that of Menelaus in the *Orestes*.[136]

The criticisms people bring forward, then, are of five forms: that things are impossible, non-rational, harmful, contradictory, or incorrect with respect to the craft. And resolutions must be investigated on the basis of the number of considerations just mentioned. There are twelve.

26
Epic versus Tragedy

One might be puzzled, though, as to whether epic imitation is better or tragic imitation. For if the less unrefined imitation is better, and the less unrefined is always directed to the better spectators, it is very clear that the one that imitates anything and everything is unrefined; for on the assumption that the spectators will not perceive things unless [the actor] himself adds something, a great deal of movement is set going, like inferior pipe players whirling around if they have to imitate a discus throw, or dragging around the chorus leader if playing the *Scylla*.[137] So then, tragedy is of this sort, as earlier actors also thought of later ones as being; for Mynniscus used to call Callippides a monkey, on the grounds of his being far too excessive [in his movements and gestures], and such too was the belief about Pindarus. And as **1462a1** the later ones stand to them, so the whole craft of tragedy stands to epic. They say, then, that epic is directed to decent spectators, who have no need of showy gestures,

133. Reading καὶ ἴσως ἀδύνατον.
134. Reading λυτέον.
135. *Medea* 663–758.
136. 1454a28–29.
137. Dithyramb by Timotheus.

whereas the craft of tragedy is directed to base ones. If, then, it is unrefined, it is clear that it would be worse.

Now the first point to make is that the charge is not against the craft of poetry, but against the craft of delivery, since it is possible to overact one's part with signals both in reciting an epic, precisely as Sosistratus did, and in singing, precisely as Mnasitheus of Opus used to do. Next, not all movement is to be rejected, unless dance is to be as well, but only that of base people, precisely as Callippides too was criticized for doing, and others nowadays are, on the grounds of imitating women who are not free. Further, tragedy can produce its own effect even without movement, just as epic does; for it is evident from reading it of what sort it is. If tragedy is superior in other respects, then, there is no necessity for this to belong to it.

Next point. Tragedy is superior because it has everything that epic has—for it is even permissible for tragedy to use epic's meter—and further, it has music and spectacle[138] as no small part of it, through which very vivid pleasures are created. Accordingly, it possesses vividness in reading as well as in performance. Further, because the end of the imitation is achieved in a shorter length; for what is more concentrated is more pleasurable than what is diluted with a large admixture of time (I mean, for example, if someone were to set the *Oedipus* of Sophocles in as many lines of verse as the *Iliad*). Further, the epic poets' imitation is less one and unified (a sign of this is that from any epic imitation whatsoever several tragedies are generated, so that if they compose one unified plot, it will appear curtailed if it is presented briefly, or watery if it is guided by the length that is characteristic of the meter). By "less one and unified" I mean, for example, if it is composed of several actions, just as the *Iliad* and the *Odyssey* have many parts of this sort, which have magnitude even by themselves. Yet these poems are composed, as far as is possible, in the best way, and are, to the greatest extent possible, imitations of one unified action.

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If, then, tragedy is superior in all these respects, and further with respect to the work of the craft [of poetry] (for tragedy and epic must produce not a random pleasure but rather the one mentioned), it is evident that it would be superior to epic, as attaining the end [of the craft] to a higher degree than epic does.

Where tragedy and epic are concerned, then, both themselves and their formal elements and parts, how many they are and how they differ, and what the causes are of their being well done or not, and where criticisms and resolutions are concerned, let this much be said.[139]

138. Reading καὶ τὰς ὄψεις.
139. F167 includes the fragments of the lost *Poetics* Book 2.

THE ATHENIAN CONSTITUTION*

(A) Fragments of the Lost Beginning (f1–f6)

f1

The Epitome of Heraclides 1

The Athenians initially employed kingship, and when Ion settled among them they were first called "Ionians." Pandion, who was king after Erechtheus, distributed the rule among his sons, and these continually engaged in faction.

Harpocration (α 194 Keaney): *Ancestral Apollo Is "the Pythian"*

This is a title of the god; there are many others. The Athenians have been communally honoring Apollo as "ancestral" since Ion. For when he settled Attica, as Aristotle says, the Athenians were called "Ionians" and Apollo was named their "ancestral" god.

Scholium to Aristophanes, Birds 1527: *Where "Ancestral" Comes From*

The Athenians honor Ancestral Apollo, since Ion, the Athenian polemarch ("war commander"), was born from Apollo and Creusa the wife of Xuthus.

f2

Patmos Lexicon (Lexica Graeca Minora, p. 162): Gennêtai

Long ago, before Cleisthenes had managed matters concerning the tribes,[1] the multitude of the Athenians were divided into farmers and craftsmen, and there were 4 tribes of these. Each of the tribes had 3 parts, which they called "clans" and "thirds (*trittues*)"; each of these consisted of thirty families (*genê*); and each family was composed of thirty men, those assigned to the family, who were called "elite (*gennêtai*)." From these they chose by lot the priesthoods belonging to each, such as the Eumolpidae, the Ceryces,[2] and Eteobutadae, as Aristotle records in the *Athenian Constitution*, saying the following: "4 tribes of them were put together, imitating the seasons in the years; each tribe was divided into three parts, so that in all there were twelve parts, like the months in the year, and they were called 'thirds' and 'clans'. In the clans, thirty families were arranged, as the days are in the month. The family was composed of thirty men."

* Translated by C. D. C. Reeve. Text: P. J. Rhodes, *The Athenian Constitution Written in the School of Aristotle* (Liverpool, 2017).

1. 20–21.
2. 39.2.

Scholium on Plato, Axiochus 371e: Gennêtê(i)

Aristotle says that when the whole multitude at Athens were divided into the farmers and craftsmen there were 4 tribes of them, and there were three parts of each tribe, which they call "thirds" and "clans," and of each of these there were thirty families, and each family was composed of thirty men. These men who are arranged in the families they call "elite."

Harpocration (τ 34 Keaney): *Trittys*

A *trittys* is the part that corresponds to the one-third of the tribe; for the tribe is divided into three parts, thirds, peoples (*ethnê*), and clans, as Aristotle says in his *Athenian Constitution*.

f3

The Epitome of Heraclides 1 (continues)

Theseus made a proclamation and brought these men together on the basis of an equal and similar share.

Plutarch, Theseus 25.1–3

Wishing to increase the city still more, he summoned them all on equal terms, and "Come hither all you people" was a proclamation of Theseus, they say, when he established a whole people (*pandêmia*). But he did not allow the democracy to become disorderly or mixed due to the influx of an indiscriminate multitude of people, but first he set apart the aristocrats, the farmers, and the craftsmen. He granted to the aristocrats to know about divine things, to supply the officials, and to be teachers of laws and interpreters of holy and sacred things, but he established them in a sort of equality with the other citizens: the aristocrats seeming to be superior in reputation, the farmers in use, and the craftsmen in numbers. That he was the first to incline to the mob, as Aristotle says, and renounce monarchical rule, Homer too seems to attest in "the catalog of ships,"[3] calling only Athenians a "people (*dêmos*)."

f4

The Epitome of Heraclides 1 (continues)

[Theseus] came to Scyros and died there, pushed down the cliffs by Lycomedes, who feared that he would make the island his own. Later, after the Persian Wars, the Athenians transported his bones [back to Athens].

3. *Iliad* 2.494–759.

Vatican Scholium on Euripides, Hippolytus 11: Of Holy Pittheus

Aristotle reports that Theseus came to Scyros for prospecting, which made perfect sense because of his kinship with Aegeus, but died after being pushed down the cliffs, since Lycomedes the king was afraid of him. . . . After the Persian Wars the Athenians, in accord with an oracle, carried his bones off [back to Athens] and buried them.

f5

The Epitome of Heraclides 1 (continues)

After the Codridae,[4] kings were no longer chosen, because they seemed to be given to luxury and to have become effeminate. But Hippomenes, one of the Codridae, wished to rebut the slander: when he caught a seducer with his daughter Leimone, he killed him by yoking him under his chariot, and shut her up with the horse until she died.

f6

The Epitome of Heraclides 2 (continues)

Because of the tyranny, those with Cylon fled to the altar of the goddess,[5] but were killed by those around Megacles. And those who did this they drove out as accursed.[6]

(B) Cylon (1)

1.1 . . . with Myron, chosen on an aristocratic basis, prosecuting, and swearing an oath over sacred sacrificial animals. When they had been condemned as accursed, they themselves[7] were cast out of their tombs, and their family went into exile, permanent exile. On this basis, Epimenides the Cretan purified the city.

(C) Between Cylon and Solon (2–4)

2.1 After that, faction occurred for a long time between the notables and the multitude. |2.2| For their constitution was oligarchic in all other respects, and the poor—themselves, their children, and their wives—were enslaved to the rich. And they were called "dependents (*pelatai*)" and "sixth-parters (*hektêmoroi*)," because they worked the

4. Codrus and his family.
5. Athena.
6. Cylon and his supporters attempted to seize the Acropolis. They failed and fled as suppliants to the altar of Athena. Megacles, together with others, killed them, incurring a curse on his family, the Alcmaeonids, for harming those under divine protection.
7. The Alcmaeonids.

fields of the rich for this payment.[8] All the land was owned by a few men. And if they did not make their payments, they and their children were subject to seizure. And loans were made to all on the security of the person up until Solon: he was the first champion of the people. |2.3| The harshest and bitterest aspect of the constitution for the many was enslavement, although they were discontented with other aspects too. For there was (one might almost say) nothing in which they had a share.

3.1 The order of the ancient constitution before Draco was of the following sort. They appointed the officials in accord with aristocratic birth and wealth. At first they were officials for life, after that for ten years. |3.2| The greatest and first of the offices were those of the king (*basileus*), the polemarch ("war commander"), and the archon. Of these, the first was that of the king; for it was ancestral. Second, the office of polemarch was established in addition, because some of the kings were fainthearted in military matters, which is why they also summoned Ion[9] when the need arose. |3.3| The last office was that of the archon. Most say that this came into being in the time of Medon, but some in the time of Acastus. The latter cite as proof the fact that the nine archons swear that they will abide by their oaths as in the time of Acastus, suggesting that under him the descendants of Codrus gave up the office of king in exchange for the grants made to the archon. Whichever way this was, it makes little difference for the chronologies. A sign that this was the last of the offices is also that the archon managed none of the ancestral matters, as the king and the polemarch do, but simply the additional ones. This is also why it has lately become the major office, increased by the additional ones. |3.4| The thesmothetae[10] were elected many years later, when the officials were already elected annually, to write down the statutes (*thesmia*) and preserve them for judging disputes. That is why this office alone was never for more than a year. |3.5| In time, then, this is how the offices preceded each other. The nine archons were not all together, but rather the king occupied what is now called the "Bucolium," near the Prytaneum (a sign of this is that still today the union of the king's wife and marriage with Dionysus take place there), the archon occupied the Prytaneum, and the polemarch the Epilyceum, which was previously called the "Polemarcheum," but after Epilycus rebuilt and restored it when he served as a polemarch, it was called the "Epilyceum." The thesmothetae occupied the Thesmotheteum. In the time of Solon, however, they all came together in the Thesmotheteum. They had absolute authority to judge suits, and not, as now, to hold only a preliminary investigation. As regards the offices, then, this is the way it was. |3.6| The council of the Areopagus had the position of watching over the laws, but it also managed most and the most important things in the city, with authority both to punish and fine all those who are disorderly. For choosing the archons was

8. I.e., one-sixth of their produce.
9. As polemarch.
10. 59, 63–65.

on the basis of aristocratic birth and wealth; from them the Areopagites were appointed. That is why this office alone of the offices has remained to be for life even now.

4.1 This is the outline of the first constitution. After that, in the archonship of Aristaechmus,[11] when not much time had passed, Draco set up his statutes. The way this was ordered was as follows. |4.2| Citizenship had been given to those provided with hoplite weapons. They elected the nine archons and the treasurers from those possessing unencumbered property worth not less than ten minas, the other officials, the lesser ones, from those provided with hoplite weapons, and the generals and cavalry commanders from those declaring unencumbered property of not less than a hundred minas, with legitimate children over ten years old by a lawfully wedded wife. These officials were required to take guarantors from the prytanes,[12] generals, and cavalry commanders of the previous year until they had undergone their inspections, accepting as guarantors 4 men from the same property class as the generals and the cavalry commanders in chief. |4.3| There was to be a council of four hundred and one men chosen by lot from those with citizenship. Both for this and for the other offices those over thirty drew lots, and the same man was not to hold office twice before all men had gone through; at this point they drew lots again from the start. If any of the councilors, when there was a session of the council or assembly, was absent from the meeting, if he was a five-hundred-bushel-man he paid three drachmas, if a cavalryman two, and if a yoke-man one.[13] |4.4| The council of the Areopagus was guardian of the laws and watched over the officials, so that they exercise their powers in accord with the laws. It was possible for anyone treated unjustly to make an indictment before the council of the Areopagus showing what law was broken by the injustice done to him. |4.5| Loans were made on the security of the person, as was said,[14] and the land was in the hands of a few men.

(D) Solon (5–12)

5.1 When that was the sort of order in the constitution, and the many were enslaved to the few, the people rose up against the notables. |5.2| Since the faction was strong and they had been set against each other for a long time, they together elected Solon as reconciler and archon,[15] and turned the constitution over to him, since he had written the elegy of which this is the start:

11. c. 621/0 BC.
12. 43–44.
13. 7.4.
14. 2.2.
15. 594/3 BC.

> I know, and pains lie within my heart,
> When I see the oldest land of Ionia
> Declining.[16]

In this poem he fights and disputes against each side on behalf of the other, and after that advises them jointly to cease the rivalry besetting them. |5.3| Solon was by nature and reputation one of Athens' first men, but by property and circumstances one of those in the middle,[17] as is agreed on other grounds, and as he himself attests in these poems, when he exhorts the rich not to be greedy:

> You must calm the strong passion in your hearts,
> You who have driven your way to an excess of many good things,
> And must place your great thoughts in moderate things. For neither will *we*
> Obey you, nor to *you* will all things be perfectly suited.[18]

And always he places the blame for the faction wholly on the rich. That is why at the start of his elegy too he says he feared "both love of wealth and arrogance," since it was because of these that the enmity had arisen.

6.1 When he was in control of affairs, Solon freed the people both in the present and for the future, forbidding lending on the security of the person, and he enacted laws and made cancellations of both private and public debts, which they call "the shaking-off of burdens (*seisachtheia*)," as they had shaken off the weight. |6.2| In regard to these matters some people try to slander him. For it so happened that when Solon was about to carry out the shaking-off of burdens, he mentioned it in advance to some of the notables. Then, as democrats say, he was outmaneuvered by his friends, or, as those who wish to slander him say, he himself also joined in. These men borrowed money, bought up a large quantity of land, and not long afterward, after the cancellation of debts occurred, grew rich. This they say was the origin of those who were later thought to be "rich from old money." |6.3| However, the account of the democrats is more persuasive. For it is not likely that a man who in the other respects was so moderate and community-minded, that when he could have outwitted the others by underhanded tricks and become tyrant of the city, instead put up with the hatred of both sides by placing what is noble and the safety of the city above his own greed, would sully himself in such petty and visible ways. |6.4| That he had this possibility is something that the diseased state of public affairs attests, that in his poetry he himself also mentions in many places, and that all the others agree with. We must think, then, that this charge is false.

16. Fr. 4a West.
17. *Pol.* 1296^{a}18–20.
18. Fr. 4c West.

7.1 He established a constitution[19] and also enacted new laws, and they stopped using the statutes of Draco except regarding homicide. They wrote up the laws on wooden pillars and set them up in the king's Porch, and everyone swore to use them. And the nine archons, when taking an oath at the stone,[20] promised to dedicate a gold statue if they transgressed any of the laws, which is the origin of their still swearing this oath today. |7.2| He locked in the laws for a hundred years, and arranged the constitution in the following way. |7.3| He divided [the people] by a property assessment into four property classes, just as they had also been divided before: the five-hundred-bushel-men, the cavalrymen, the yoke-men, and the hired laborers. And to hold the major offices he assigned men from the five-hundred-bushel-men, the cavalrymen, and the yoke-men: the nine archons, the treasurers, the sellers of city contracts (*pôlêtai*), the Eleven,[21] and the public treasury officials (*kôlakretai*), granting offices to each in proportion to the size of his wealth assessment. But to those in the class of hired laborers he assigned the assembly and the courts alone. |7.4| A man had to be classed as a five-hundred-bushel-man if he produced from his own property five hundred bushels both wet and dry; and men had to be classed as cavalrymen if they produced three hundred bushels—or, as some say, if they were able to keep a horse. As a sign of this they point to the name of the class, as deriving from this underlying fact, and the dedications of the ancients. For a statue of Diphilus is dedicated on the Acropolis, on which the following is inscribed:

> Anthemion dedicated this [statue] of Diphilus to the gods,
> Having changed the hired laborer class for the cavalryman's.

And a horse has been placed beside it, attesting that the cavalryman's class means this. However, it is more reasonable that it was determined by measures, as with the five-hundred-bushel-men. Classed as yoke-men were those producing two hundred bushels both [wet and dry]. The others were classified as hired laborers, sharing in no office. That is why even now, no one about to be assigned by lot to some office who is asked what his property class is would say "hired laborer."

8.1 He made the officials be chosen by lot from pre-selected ones that each of the tribes had pre-selected. Each tribe pre-selected ten men for the nine archonships, and from these they made the allotments; this is the origin of why it still remains the case that each of the tribes chooses by lot ten men, and then they choose by lot from these. A sign that he made appointments be chosen by lot from the assessment classes is the law about the treasurers, which they continue to use even now; for it tells them to choose by lot the treasurers from the five-hundred-bushel-men. |8.2| Solon, then, legislated in this way about the nine archons. In ancient times the council of the Areopagus summoned and judged for itself the one who was suitable for each of the offices, and

19. Discussed in *Pol.* 2.12.
20. 55.5.
21. *Pol.* 1322ª19–20.

appointed and dispatched him for the year. |8.3| There were four tribes as previously, and four tribal kings.[22] From each of the tribes three thirds were distributed, with twelve naucraries in each. The officials appointed to be in control of the naucraries were the naucrari,[23] assigned in regard to ongoing incomes and expenses. That is why in the laws of Solon too, which are no longer used, it is often written, "The naucrari are to exact," and "spend from the naucraric silver." |8.4| He made a council of four hundred, one hundred from each tribe, but he appointed the council of the Areopagus to guard the laws, just as it had earlier too been the overseer of the constitution, and it watched over the greatest number and the most important of the political matters. It called wrongdoers to account, since it had the authority both to fine and to punish, and carried the payments [of financial dues] up to the Acropolis, but did not write down the alleged cause for the calling to account; and it judged those conspiring for the dissolution of the democracy, with Solon legislating the law of indictment about them. |8.5| Seeing that the city was often factionalized, but that some of the citizens through idleness accepted whatever happened to occur, he passed a law special to them, that anyone who did not put his weapons at the disposal of one side or the other when the city was factionalized should be deprived of his citizen status and not participate in the city.

9.1 This, then, is how things stood regarding the offices. The following three seem to be the most democratic features of Solon's constitution. The first and greatest was not lending on the security of the person; second was the possibility for anyone who wished to seek vengeance for those who were done an injustice; and third, by which they say the people were above all strengthened, was the appeal to the court; for when the people have control over the vote,[24] they have control over the constitution. |9.2| Further, because his laws were not written simply or perspicuously, but were like the law about inheritances and heiresses,[25] there were necessarily many disputes and the court needed to arbitrate all public and private matters. Some think that he made his laws lack perspicuousness deliberately, so that the people would have the authority to judge. But this is not likely—probably it was because he was unable to circumscribe what was best in universal terms. For it is not just to speculate about what he wished on the basis of what occurs now, but rather on the basis of the rest of his constitution.

10.1 These, then, seem to be the democratic features of the laws that he enacted; and before his legislation, he made the cancellation of debts, and after that the increase in the measures, weights, and coinage. |10.2| For it was in his time that the measures were made greater than those of Pheidon, and that the mina, which previously had the weight of seventy drachmas, was filled up to one hundred. The ancient standard coin was the two-drachma piece. He also made weights corresponding to the coinage, with

22. 41.2, 57.4.
23. The etymology of the term suggests that it means something like "ship-chief."
24. Of guilty or not guilty.
25. 35.2.

sixty-three minas making up a talent, and the three minas distributed among the stater and the other weights.

11.1 After he had arranged the constitution in the way stated, people kept approaching and troubling him about the laws, blaming him for some things and interrogating him about others. Since he wished neither to change these nor to be hated by his presence, he made a trip abroad to Egypt for purposes of trade and at the same time for sightseeing, and said that he would not return for ten years. For he did not think that it was just to remain present and explain the laws, but rather that each person do what was written. |11.2| At the same time it so happened that many disputes with him arose from the notables due to the cancellations of debts, and also that both factions had changed their views because the settlement was unacceptable to them. For the people thought that he would make a redistribution of everything, while the notables thought that he would restore everything to the same order [as before] or change things only a little bit. But Solon was opposed to both, and while it was possible for him to stand with whichever side he wished and be tyrant, he chose to be hated by both sides, saving his fatherland and legislating what was best.

12.1 All the others agree that this is the way he was, and he himself in his poetry made mention of these matters in the following words:

> To the people I gave as much privilege as is sufficient,
> Neither taking away their honor nor reaching out for it;
> But as for those who had power and were admired for their wealth,
> I also declared that they should have no unseemly share.
> I stood, putting a stout shield around both,
> And did not allow either an unjust victory.[26]

|12.2| Again, revealing how the multitude should be treated:

> This is how the people would best follow their leaders
> Neither let loose too much nor forced,
> For excess breeds wanton aggression, when great prosperity attends
> Such people as have no sound mind.[27]

|12.3| And again somewhere else he says about those who wished the land to be distributed:

> They came for plunder with abundant hope,
> And each thought to find great prosperity,
> And that I, though smoothly cajoling, would show a harsh mind.

26. Fr. 5 West.
27. Fr. 6 West.

Empty things they thought then, but now in anger
They all look askance at me as if I were their enemy.
It should not be so; for what I said, with the gods' aid I accomplished.
I did nothing else pointlessly, nor does it please me
To do anything with the violence of a tyrant, or for the base
To have an equal share of the rich earth of our fatherland with the noble.[28]

|12.4| And again, both about the cancellation of debts and those previously enslaved but freed through the shaking-off of burdens, he says:

Which of the things I drew together
The people for, did I stop before I achieved?
Best witness to this in the justice of time will be
The mother, greatest of the Olympian daimons,
Black Earth, from which I once
Took up the boundary stones fixed in many places,
Who was previously enslaved, but now is free.
Many men to Athens, to their god-founded fatherland
I brought back, who had been sold, some unjustly,
Some justly, some having fled from compelling
Debt, no longer speaking the Attic
Tongue, but wandering in many places.
And those right here, suffering shameful
Slavery, trembling at their masters' ways,
I made free. These things I did by might,
Fitting together force and justice,
And I accomplished what I promised.
Statutes equally for base and noble,
Fitting straight justice to each man,
I wrote down. Another man who took up the goad as I did,
A man of evil counsel and love of possessions,
Would not have restrained the people. For had I been willing
To do what pleased their opponents at that point,
Or again to do what the other side planned against them,
The city would have been widowed of many men.
On account of this, making a defense on all sides,
I turned like a wolf among many bitches.[29]

|12.5| And again reproaching the subsequent faultfinding of both sides:

As for the people, if I am to chide them openly,
What they have now their eyes would never

28. Fr. 34 West.
29. Fr. 36 West.

Have seen even in their dreams.
And those who are greater and in force superior
Should praise me and make me their friend.

"For if some other man," he says, "had obtained this honor,"

He would not have held the people back, nor ceased
Until he stirred up the milk and taken off the fat.
But as in a no-man's-land between these men
Like a boundary stone I stood.[30]

(E) Between Solon and Pisistratus (13)

13.1 Solon went abroad due to these causes. While he was abroad, and the city was still disturbed, for four years they remained at peace. But in the fifth year after Solon's archonship,[31] because of the faction, they did not appoint an archon; and again in the fifth year,[32] due to the same cause, they had an archon-less year. |13.2| After that, with the same lapse of time, Damasias, when elected archon,[33] held office for two years and two months, until he was expelled from office by force. Then, because of the faction, they decided to choose ten archons, five from the aristocrats, three from the rustics, and two from the craftsmen, and these men held office for the year after Damasias. From this too it is clear that the archon had the greatest power. For it is evident that it is about this office they were always engaged in faction. |13.3| In general, they continued in a diseased state in matters relating to each other, some having the cancellation of debts as starting-point and alleged cause (for it turned out that they became poor), some being annoyed because of the constitution, because of the great change that had occurred, and some because of their rivalry with each other. |13.4| There were three factions, one of the coastal men, whose champion was Megacles the son of Alcmeon, who seemed especially to be pursuing a middle constitution; another of the men of the plain, who sought oligarchy, and Lycurgus led them; the third was that of the men beyond the hills, over whom Pisistratus was appointed, seeming to be the most democratic. |13.5| Added as a further adornment to these men were those who had been deprived of the debts owed to them, because of their loss, and those who were not pure in ancestry, because of their fear. A sign of this is that after the overthrow of the tyrants[34] they held a review of citizenship vote, since many shared in the constitution without being fitted to do so. [The three factions] each got their name from the places where they farmed.

30. Fr. 37 West.
31. 590/89 BC.
32. 586/5 BC.
33. 582/1 BC.
34. 510 BC.

(F) The Tyranny (14–19)

14.1 Pisistratus seemed to be the most democratic, and acquired a very good reputation during the war against the Megarians.[35] He wounded himself and, as if he had suffered this at the hands of the rivaling factions, persuaded the people to give him a bodyguard; it was Aristion who wrote the proposal. He took these who were called "club-bearers," rose up against the people with these men, and—in the thirty-second year after the enactment of [Solon's] laws, in the archonship of Comeas[36]—seized the Acropolis. |14.2| It is said that when Pisistratus asked for a bodyguard, Solon spoke against it. He said that he was wiser than some people and more courageous than others; for he was wiser than those who did not know that Pisistratus was aiming at tyranny and more courageous than those who knew but remained silent. When he had spoken but had not persuaded, he set up his weapons in front of his door, and said that he had aided his fatherland as far as he was able (for he was already very old), and thought it fitting that others too should do this same thing. |14.3| Solon accomplished nothing when he made these appeals. But Pisistratus, after he seized the ruling office, managed public affairs like a true politician rather than tyrannically.[37] Yet, when his rule had not yet taken root, those with Megacles and those with Lycurgus reached a settlement and—in the sixth year after the start of his tyranny, in the archonship of Hegesias[38]—drove him out. |14.4| In the fifth year after that, Megacles, who was harassed by factional strife, again made overtures to Pisistratus, on condition that he marry his daughter, and brought him back in an archaic and overly simple way. For having spread in advance the story that Athena was bringing back Pisistratus, he found a tall and beautiful woman—from the deme of Paeania, as Herodotus says,[39] or, as some say, a Thracian garland seller from Collytus—whose name was "Phye," and adorning her in imitation of the goddess brought her in with Pisistratus; and Pisistratus drove in a chariot with the woman standing beside him. And those in the city proper, wonderstruck, received him with adoration.

15.1 His first return, then, happened like that. After that, he was driven out for the second time, around the seventh year after his return; for he did not hold his position for a long time, but because he did not wish to have intercourse with Megacles' daughter, he became afraid of both [the other] factions and withdrew. |15.2| First, he joined in settling a place around the Thermaic gulf called "Rhaicelus"; from there he went to the areas around Mt. Pangaeus, where he procured money and hired soldiers; and in the eleventh year he went to Eretria again. This was when he first tried to recover his rule by force, with many others eagerly supporting him, especially the Thebans, Lygdamis of Naxos, and the cavalry that controlled the constitution in Eretria. |15.3| He won

35. Over the possession of Salamis.
36. 561/0 BC.
37. *Pol.* 1305^{a}23.
38. 556/5 BC.
39. 1.60.4.

the battle at Pallene, captured the city,[40] and deprived the people of their weapons, and then held the tyranny securely. He also captured Naxos and established Lygdamis as its ruler. |15.4| He deprived the people of their weapons in the following way. Holding an armed parade in the Theseum, he attempted to address the assembly, and continued to speak to them for a short period of time. When they claimed they could not hear him, he told them to go up to the entrance gate of the Acropolis, in order for him to make himself heard better. And while he spent time speaking to them, those who had been appointed for this task took up the weapons and locked them in the nearby buildings of the Theseum, and then went to Pisistratus and gave him a sign. |15.5| When he had completed the rest of his speech, he told them what had happened to their weapons, and that they must not wonder or be despondent, but go away and look to their private affairs, while he himself would take care of all public ones.

16.1 The tyranny of Pisistratus was initially established in this way and involved this many changes. |16.2| Pisistratus, as was said,[41] managed matters concerning the city moderately and more like a true politician than tyrannically. For among other things he was humane to others, gentle and forgiving to those who made errors, and in particular lent money in advance to those without means for their occupations to support them in their farming. |16.3| He did this for the sake of two things, so that they would spend their time not in the city proper but dispersed across the countryside, and that by doing well with moderate means and being involved with their own affairs, they would neither have an appetite nor leisure for public ones. |16.4| At the same time, this resulted in his income also becoming greater, since the land was well worked; for he exacted one-tenth of the produce in tax. |16.5| That is also why he established the deme judges, and why he himself went out often into the countryside, overseeing and reconciling those who had disputes, so that they would not go down to the city proper and neglect their work. |16.6| When Pisistratus was making one such excursion, they say that the incident occurred of the man farming what was later called the "tax-free farm" on Mount Hymettus. For he saw someone digging and working what were altogether stones, and because of his surprise, he told his slave to ask what was produced from the plot. The man said, "Just evils and pains, and of these evils and pains Pisistratus should take a tenth in tax." The man answered without recognizing him. But Pisistratus was pleased by his freedom of speech and love of working, and freed him of all taxes. |16.7| He did nothing to trouble the multitude in other respects during his rule either, but always worked for peace and protected calm. That is also why many good reports were spread that the tyranny of Pisistratus was life under Cronos;[42] for it so happened that later on, when his sons succeeded him, the rule became much harsher. |16.8| The greatest of all the things mentioned was that he was democratic in character and humane. And in

40. Athens.
41. 14.3.
42. I.e., a golden age.

other respects, in fact, he wished to manage everything in accord with the laws, giving no greater share to himself; and once when he had been summoned to the Areopagus to stand trial for homicide, he appeared in court to defend himself, but the one who summoned him took fright and abandoned it. |16.9| That is also why he continued to rule for a long time, and when he was expelled,[43] he easily regained it. For the majority of both the notables and of the democrats wished him to, and he brought over to his side the first due to his friendly dealings with them, and the second due to his aid in their private affairs; and to both he was good-natured. |16.10| Also, the laws of the Athenians about tyrants were mild in these times, both the others and in particular the law about the establishment of a tyranny was especially so. This was their law: "These are the ancestral statutes of the Athenians: if any men aim at tyranny or a man aids in establishing a tyranny, he shall be deprived of citizen status, both himself and his family."

17.1 Pisistratus, then, grew old in his rule and, after becoming ill, died in the archonship of Philoneus,[44] having lived thirty-three years from when he was first established as tyrant. But he had remained in power for [only] nineteen years; for he was in exile the rest of the time. |17.2| That is also why it is evident that those people who claim that Pisistratus was the beloved of Solon and a commander in the war against the Megarians over Salamis are speaking foolishly. For that is not possible given their ages, if one calculates the lifespan of each man and the archon when he died. |17.3| When Pisistratus died, his sons held the rule, conducting affairs in the same manner. He had two sons from his lawfully wedded wife, Hippias and Hipparchus, and two from the Argive woman, Iophon and Hegesistratus (whose other name was "Thessalus"). |17.4| For Pisistratus married Timonassa, the daughter of an Argive man named "Gorgilus," who had previously been the wife of Archinus of Ambracia, of the Cypselids. From this, in fact, came his friendship toward the Argives, and a thousand of them, brought by Hegesistratus, fought together with him at the battle at Pallene.[45] Some say he married the Argive woman when he was expelled the first time, others when he [first] gained possession of his rule.

18.1 Because of their good reputations and their youth, Hipparchus and Hippias were in control of affairs, while Hippias, who was older and by nature a [true] politician and sensible, was in charge of the rule. Hipparchus was childish, amorous, and a lover of music and the arts (he was the one who summoned such men as Anacreon, Simonides, and the other poets). |18.2| Thessalus was much younger, and in his mode of life rash and prone to wanton aggression. From him too it turned out that all their troubles arose. For he was in love with Harmodius, and when he failed to win his affection, he did not

43. 17.1
44. 528/7 BC.
45. 15.3.

retrain his anger, but in other respects gave many bitter signs of it; finally, he prevented Harmodius' sister from carrying baskets in the Panathenaic festival[46] after somewhat insulting Harmodius as effeminate. This was the origin of the fact that Harmodius and Aristogeiton were provoked to take action, with many sharing in it. |18.3| When they were already on the Acropolis observing Hippias at the Panathenaic festival (for he happened to be receiving the procession, and Hipparchus to be sending it off), they saw one of those taking part in their action greeting Hippias cordially. They thought that he was betraying them and, wishing to do something before their arrest, they went down and, starting before the others, killed Hipparchus who was arranging the procession in front of the Leocoreum. This ruined the whole action. |18.4| Of these men, Harmodius was immediately killed by the spear-bearers, while Aristogeiton was arrested later and tortured for a long time. In his agony he accused many men who were both by birth among the distinguished and friends of the tyrants. For they could not immediately get hold of any trace of [the originators of] the action. But the story that was told, that Hippias had removed the weapons from those in the procession when he discovered the ones with daggers, is not true. For men did not at that time take part in the procession armed with weapons, but the democracy did later institute this. |18.5| He accused the friends of the tyrant deceitfully, as the democrats say, so that the tyrants might at the same time act impiously and become weak, by having killed those who were not responsible and their friends; but as some people say, he did not fabricate this, but instead betrayed those who were informed about the plan. |18.6| In the end, when he was unable, though doing everything, to bring about his death, he promised to disclose many others, and persuaded Hippias to give him his right hand as a pledge. When Hippias took it, he insulted him for having given his right hand to his brother's killer. This so provoked Hippias that, because of his anger, he could not restrain himself, but drew out his dagger and killed him.

19.1 What happened after that is that the tyranny became much harsher. For because of the avenging of his brother and the killing and driving out of many, Hippias was untrusting and bitter toward everyone. |19.2| In the fourth year, especially, after the death of Hipparchus,[47] when things in the city proper were in a bad way, he tried to fortify Munichia in order to be relocated there. While he was engaged in this, he was driven out by Cleomenes, the king of the Spartans, since the Spartans were constantly receiving oracles to dissolve the tyranny, due to the following cause. |19.3| The exiles, of whom the Alcmaeonids were the leaders, were unable to achieve their own return by themselves, but always stumbled. For in the other things they did, they failed, and, when they walled up Lipsydrium, in the countryside beyond Parnes, which some of those from the city proper had entered, they were besieged by the tyrants, as a result of which, after this disaster, they later on used to sing in the drinking songs:

46. Implying that she was not a virgin.
47. 510 BC.

Alas, Lipsydrium, betrayer of comrades,
What men you lost,
Good at fighting and aristocratic,
Who then showed what fathers they had.

|19.4| After failing at everything else, they contracted to build the temple at Delphi, thereby becoming well supplied with money for gaining the Spartans' aid. When the Spartans consulted the oracle, the Pythia always added that they should free Athens, persisting until the moment she urged the Spartiates into doing this, even though the Pisistratids were guest-friends of theirs. But no less a contribution was made to the Spartans' impulse by the Pisistratids' already-existing friendship toward the Argives. |19.5| First, then, they sent Anchimolus with an expedition by sea. When he was defeated and died, because Cineas the Thessalian came to their aid with one thousand cavalry, they became angrier at what had occurred and sent out Cleomenes the king with a greater army by land. When he defeated the cavalry of the Thessalians, which tried to prevent him from entering Attica, he shut up Hippias in the so-called Pelargic fort, and together with the Athenians besieged him. |19.6| While he was being besieged, it so happened that Cleomenes captured the sons of the Pisistratids slipping out. When these had been captured, the Pisistratids made an agreement for the safety of the children, carried out their own property within five days, and handed over the Acropolis to the Athenians. This was in the archonship of Harpactides,[48] when they had held the tyranny for around seventeen years after their father's death. The total together with the years their father ruled was thirty-six.

(G) From Cleisthenes' Reforms to Xerxes' Invasion (20–22)

20.1 After the tyranny had been dissolved, Isagoras the son of Tisander, a friend of the tyrants, and Cleisthenes, a member of the Alcmaeonid family, engaged in faction with each other. When he was defeated [by him] in the political clubs,[49] Cleisthenes tried to win the people over to his side by offering the constitution to the multitude. |20.2| Isagoras, failing in power, again summoned back Cleomenes, who was his guest-friend, and persuaded him to drive out the curse,[50] because the Alcmaeonids were thought to be among those accursed. |20.3| Cleisthenes withdrew and Cleomenes arrived with a few men and expelled as accursed seven hundred Athenian households. After he had accomplished this, he tried to dissolve the council [of five hundred], and to establish Isagoras and three hundred of his friends along with him in control over the city. But when the council resisted and the multitude came together, those together with Cleomenes and Isagoras fled to the Acropolis, and the people blockaded and besieged

48. 511/10 BC.
49. 34.3.
50. f6.

them for two days. On the third day, they allowed Cleomenes and all those with him to leave under treaty, and recalled Cleisthenes and the other exiles. |20.4| When the people got control of affairs, Cleisthenes was the leader and the champion of the people. For the Alcmaeonids were mostly responsible for the expulsion of the tyrants, and for most of the time continued to engage in faction [with them]. |20.5| Even earlier, Cedon of the Alcmaeonids had attacked the tyrants, which is why they sang to him too,[51] also in their drinking songs:

> Pour to Cedon too, steward, and do not forget,
> If it is to good men that we are to pour wine.

21.1 Due to these causes the people trusted Cleisthenes. Then, as champion of the multitude, in the fourth year after the overthrow of the tyranny, in the archonship of Isagoras,[52] |21.2| first, he divided everyone into ten tribes instead of four, wishing to mix them up, so that more would share in the constitution. From this it was said "no judging by tribes," to those who wished to investigate people's ancestry. |21.3| Then he established a council of five hundred instead of four hundred, fifty from each tribe (at that time they were one hundred from each). He did not arrange them in twelve tribes for the following reason: so that the division does not take place on the basis of the preexisting thirds. For from the 4 tribes there were twelve thirds, in which case the result would be that the multitude not get mixed together. |21.4| He also distributed the territory to thirty parts by demes, ten of those in the city proper, ten of the coast, and ten of the interior, and calling these "thirds," he assigned by lot three to each tribe, so that each tribe would have a share in all the regions. And he made those who lived in each of the demes fellow-demesmen of each other, so that they would not put to shame the new citizens by addressing each other by patronymics, but address them by demes; which is why the Athenians too call each other by demes. |21.5| He also established demarchs, having the same supervision as the earlier naucrari. For he also made the demes in place of the naucraries.[53] He named some of the demes from their places, some from their founders; for not all still corresponded to the particular places. |21.6| He allowed each person to belong to families, phratries, and priesthoods, in accord with ancestral customs. For the tribes he produced eponymous heroes; it was Pythia who chose ten from a hundred pre-selected ones.

22.1 When this took place, the constitution became much more democratic than Solon's. For what happened, in fact, is that the tyranny had made the laws of Solon disappear by not using them, while Cleisthenes, aiming at the multitude, put in place other new ones, among which the law about ostracism was also set up. |22.2| First,

51. 19.3.
52. 508/7 BC.
53. 8.3.

then, in the eighth year after this settlement, in the archonship of Hermocreon,[54] they produced the oath for the council of Five Hundred, which they still swear today. Next, they elected the generals by tribes, one from each tribe, and the polemarch was the leader of the whole army. |22.3| In the twelfth year after that, in the archonship of Phaenippus,[55] they won the battle at Marathon. Two years after this victory, when the people were by now feeling confident, they then first used the law about ostracism, which was set up due to suspicion about those in power, because Pisistratus from being a popular leader and general was established as tyrant. |22.4| The first to be ostracized was one of his kinsmen, Hipparchus of Collytos, the son of Charmus; and it was especially because of him that Cleisthenes had set up this law, since he wished to drive him out. For the Athenians, in accord with the people's customary mild-manneredness, allowed all the friends of the tyrants who had not joined in committing offenses during the disturbances to live in the city. Of these men Hipparchus was the leader and champion. |22.5| Immediately afterward, in the next year, in Telesinus' archonship,[56] for the first time since the tyranny, they chose by lot the nine archons, according to tribe, from the five hundred men pre-selected by the demesmen. By contrast, all previous archons had been elected [by vote]. And Megacles from Alopece, the son of Hippocrates, was ostracized. |22.6| For 3 years, then, they ostracized the friends of the tyrants, on account of whom this law was set up, but after that, in the fourth year,[57] they also removed any of the others who seemed to be too powerful. And the first of those ostracized who was distant from the tyranny was Xanthippus the son of Ariphron. |22.7| In the third year after that, in the archonship of Nicodemus, when the mines at Maroneia were discovered and the city gained a hundred talents from their works, some men advised distributing the silver to the people, but Themistocles prevented this. He did not say how he would use the money, but told them to lend one talent to each of the hundred richest Athenians; then, if they were satisfied with the outlay, the expense would be the city's; if not, the city should get back the money from those who had borrowed it. Taking the money on these terms, he had one hundred triremes built, with each of the hundred men building one; and with these they fought at Salamis against the barbarians.[58] It was in these times that Aristides the son of Lysimachus was ostracized. |22.8| In the fourth year, in the archonship of Hypsichides,[59] because of Xerxes' expedition, they took back all those who had been ostracized. And for the future they determined that those ostracized should live within Geraestus and Scyllaeum, or else be permanently deprived of their citizen status.

54. 501/0 BC.
55. 490/89 BC.
56. 487/6 BC.
57. 485/4 BC.
58. I.e., the Persians.
59. 481/0 BC.

(H) The Mid-Fifth Century (23–28)

23.1 At that time, then, the city went forward up to this point, increasing little by little together with the democracy. After the Persian Wars the council of the Areopagus grew strong again and managed the city, taking the leadership not by any formal decision but because it was responsible for [winning] the sea battle at Salamis. For when the generals were at a loss because of events and had made a proclamation that everyone should save himself, it provided and distributed eight drachmas to each man and got them to embark on the ships. |23.2| Due to this cause, then, the Athenians yielded to the council's reputation and were well governed also in these times. For it so happened that at this time they were practiced in warfare, were well thought of by the Greeks, and also—against the wishes of the Spartans—acquired supremacy at sea. |23.3| The champions of the people in these times were Aristides the son of Lysimachus and Themistocles the son of Neocles, the one being thought to [be practiced in] warfare, the other to be clever as a politician and to surpass his contemporaries in justice. That is why they made use of the one as a general, and of the other as an advisor. |23.4| The rebuilding of the walls, then, they managed together, although differing with each other; but in the case of the defection of the Ionians from the Spartans' alliance, it was Aristides who urged that forward, having observed that the Spartans were brought into discredit because of Pausanias.[60] |23.5| That is also why it was he who—in the third year after the sea battle at Salamis, in the archonship of Timosthenes[61]—fixed the first tribute payments for the cities; and he swore the oaths with the Ionians to have the same friends and enemies, for which they also sank the molten irons in the sea.[62]

24.1 After that, when the city was by now feeling confident and much money had been accumulated, Aristides advised [the people] to take the leadership, and to come down from the fields to live in the city proper; for there would be food for all, for those in the military, for those keeping guard, and for those active in public affairs, so that in this way they would get hold of the leadership. |24.2| Persuaded about this, and taking the rule, they exploited the allies in a more tyrannical way, except for the Chians, Lesbians, and Samians. These they kept as guardians of their rule, allowing them to keep their own constitutions and to rule those they happened to be ruling. |24.3| They established a good food supply for the many, as Aristides had proposed. For from the combined proceeds of the tributes, taxes, and allies, more than twenty thousand men were maintained. For there were six thousand judges, one thousand six hundred archers, and in addition to these, one thousand two hundred cavalry, five hundred men in the council, around five hundred guards of the docks; in addition to these, fifty guards on the Acropolis, around seven hundred local officials, and seven hundred abroad. In

60. He offended the allies and was recalled to Sparta.
61. 478/7 BC.
62. Signifying that the oaths were to endure until these irons arose from the sea.

addition to these, when later they braced themselves for war, two thousand five hundred hoplites, twenty guard ships, {other ships bringing the tribute [with crews amounting to] two thousand men chosen by lot};[63] then the Prytaneum, orphans, and guards of prisoners. For all these the financial management came from the common funds.

25.1 Food for the people, then, was provided through these means. For around seventeen years after the Persian Wars[64] the constitution remained governed by the council of the Areopagus, although it was declining [in power] little by little. As the multitude were increasing [in power], Ephialtes the son of Sophonides, a man who seemed to be unbribable and just toward the constitution, became champion of the people and attacked that council. |25.2| First, he did away with many of the Areopagites, bringing them to trial for their management of things. Then, in the archonship of Conon,[65] he took away from the council all the additional powers through which it had acquired the guardianship of the constitution, and gave some to the five hundred councilors, some to the people, and some to the courts. |25.3| He did this with Themistocles (one of the Areopagites[66] but also about to be tried for pro-Persian treason) being jointly responsible. Wishing the council to be dissolved, Themistocles told Ephialtes that it was about to arrest him, and told the Areopagites that he would show them some men conspiring to dissolve the constitution. In order to show them the men, who were gathering there, he took men chosen from the council to the place where Ephialtes was spending time, and was speaking in haste with them. When Ephialtes saw this, he was dumbstruck and took his seat at the altar with only his undergarment on. |25.4| Everyone was amazed at what had occurred, and after that, when the council of Five Hundred met, Ephialtes and Themistocles accused the Areopagites, and again in the assembly in the same way, until they stripped them of their power. And {. . .}[67] Ephialtes was also killed, treacherously murdered not much later by Aristodicus of Tanagra.

26.1 In this way the council of the Areopagus was deprived of its supervision.[68] What happened after that is that the constitution was loosened, because of those striving zealously for popular leadership. For in these times it so happened that the more respectable citizens had no leader, but acting as their champion was Cimon the son of Miltiades, who was fairly young and had only recently come forward in city affairs, and that, in addition, many of them had died in war. For military service at that time was based on the register [of troops] and, since the generals in charge were inexperienced in warfare but were honored because of their ancestors' reputations, it repeatedly happened that of those going out [to war], up to two or three thousand died, with the result that

63. The text is corrupt.
64. 479–462 BC.
65. 462/1 BC.
66. He had been archon in 493/2 BC.
67. There is a lacuna in the text at this point.
68. 3.6, 4.4, 8.2.

the most decent men, both among the people and among the wealthy, were killed. |26.2| They managed all other things not in the same way as before with respect to abiding by the laws,[69] though they did not change the election of the nine archons. But in the sixth year after the death of Ephialtes[70] they resolved that the men from whom the allotment for the nine archons was to be made should also be pre-selected from the yoke-men;[71] and the first of these to hold office was Mnesithides. Before that all of them were from the cavalrymen and the five-hundred-bushel-men, while the yoke-men held the routine offices, unless something in the laws had been overlooked. |26.3| In the fifth year after that, in the archonship of Lysicrates,[72] the thirty judges who were called "judges by demes"[73] were re-established; |26.4| and in the third year after that, in the archonship of Antidotus,[74] because of the number of citizens, they determined on the proposal of Pericles that a man who was not born from two citizens from the city proper should not participate in the city.

27.1 What happened after that, when Pericles came forward as popular leader, after having first gained a good reputation while still a young man when he brought a charge against the general Cimon at his inspection, is that the constitution became still more democratic. For he took away some powers of the Areopagus, and, above all, urged the city toward naval power, as a result of which the many, becoming confident, increasingly led the whole constitution toward themselves. |27.2| In the forty-ninth year after the sea battle at Salamis, in the archonship of Pythodorus,[75] the war against the Peloponnesians broke out, in which the people were closed up in the city proper and grew accustomed to being paid while on campaigns, and voluntarily in some matters and involuntarily in others, deliberately chose to manage the constitution themselves. |27.3| Pericles was first to introduce payment for judges,[76] counteracting as popular leader Cimon's abundance of resources. For Cimon, because he had a tyrant's wealth,[77] first performed Athens' public services brilliantly; then he maintained many of his fellow-demesmen, for anyone of the deme of Lacidiadae who wished could go each day and receive moderate means of subsistence from him; further, all his lands were unfenced, so that it was possible for anyone who wished to enjoy its fruits. |27.4| Pericles' property was insufficient to provide this service. So, on the advice of Damonides of Oea[78] (who was thought to have been the proposer of many things to Pericles, for which they ostracized

69. 41.2.
70. 456 BC.
71. 7.4.
72. 453/2 BC.
73. 16.5.
74. 451/0 BC.
75. 432/1 BC.
76. c. 460 BC.
77. His father, Miltiades, had been a tyrant in northern Greece.
78. Actually, Damon of Oa.

him later[79]) that since he was being defeated through private resources, he should give the many their own, he constructed a system of public payments for judges. Some charged that as a result the judges became worse, since it was always random men rather than decent ones who were anxious to take part in the lottery.[80] |27.5| After that, the practice of judicial bribery began, with Anytus first introducing it after his generalship at Pylos. For he was brought to trial by some men for losing Pylos,[81] but he bribed the public court and got off.

28.1 As long as Pericles was champion of the people, things regarding the constitution were better, but after Pericles died[82] they were much worse. For at that time the people first took as its champion someone who was not well reputed among the decent men; but in earlier times the decent men continued to serve as popular leaders. |28.2| For, at the outset, the first champion of the people was Solon; the second was Pisistratus; and of the wellborn and notable, Lycurgus. After the tyranny was overthrown, it was Cleisthenes, of the Alcmaeonid family, and there was no factional leader opposed to him, since those around Isagoras had departed into exile. After that, Xanthippus was champion of the people, and Miltiades of the notables; then Themistocles and Aristides, respectively; after these men, Ephialtes was champion of the people, Cimon the son of Miltiades of the notables; then Pericles of the people, and Thucydides, who was a relative of Cimon, of the others. |28.3| After Pericles' death, Nicias, who died in Sicily, championed the distinguished men, and Cleon the son of Cleaenetus the people: Cleon seems especially to have corrupted the people by his [wild] impulses, and was the first to shout and utter insults from the speaker's platform and address the people with his undergarment hitched up, when the others spoke in an orderly way. Then, after these, Theramenes the son of Hagnon was champion of the others, and of the people, Cleophon the lyre-maker, who also first provided the two-obol grant.[83] (That continued for some time, but after that Callicrates of Paeania abolished it, having first promised to add another obol to the two obols.) Later they condemned both these men to death; for the multitude were accustomed, if they were deceived, later to hate those who in any way led them to do what was not proper. |28.4| From Cleophon on there was already a continuous succession in popular leadership of those who especially wished to be daring and to gratify the many, looking only to immediate concerns. |28.5| The best of the Athenian politicians after the ancients seem to have been Nicias, Thucydides, and Theramenes. About Nicias and Thucydides pretty much everyone agrees that they were not only noble and good men but also true politicians and treated the whole city in a fatherly way. But about Theramenes, because in his time there happened to be constitutional troubles, judgment is disputed. However, it seems to those who do not

79. c. 442 BC.
80. In which judges were selected.
81. To the Spartans, in 410 or 409 BC.
82. 429 BC.
83. For attending the assembly, allowing the poor to attend and vote.

declare their views cursorily that he did not dissolve all the constitutions, as people slander him by alleging, but supported them all as long as they did not transgress the laws, since he was able to take part in political life in all of them (which is precisely the work of a good citizen), but when they broke the laws he did not go along with them, but incurred their hatred.

(I) The Four Hundred and the Five Thousand (29–34)

29.1 While things were evenly balanced in the war, [the Athenians] guarded the democracy. But when, after the disaster that occurred in Sicily,[84] the Spartans' position became stronger because of their alliance with the king,[85] they were forced to remove the democracy and establish the constitution of the Four Hundred,[86] with Melobius making the speech on behalf of the decree and Pythodorus the Anaphlystian writing the formal proposal. The many were persuaded because they thought that the king would more likely fight on their side if they made the constitution oligarchic. |29.2| Pythodorus' decree was of the following nature: the people should elect along with the existing ten *probouloi*[87] twenty others from those over the age of forty who, having sworn to draft what they thought best for the city, are to draft a text concerning the public safety. Any of the others who wish is permitted to draft proposals, so that they might choose the best from all of them. |29.3| Cleitophon said in other respects what Pythodorus had said, but proposed in addition that those who were elected should also seek out the ancestral laws that Cleisthenes set up when he established the democracy,[88] so that by hearing these too they would deliberate for the best (on the supposition that the constitution of Cleisthenes was not democratic but much the same as that of Solon). |29.4| Those who were elected proposed, first, that the prytanes must put to a vote all proposals concerning public safety. Then they abolished writs for illegality (*graphai paranomôn*), indictments (*eisaggeliai*), and challenges (*prosklêseis*), so that those of the Athenians who wished might offer advice on what had been laid before them; and if anyone on account of this either proposed a penalty, made a challenge, or brought someone before a court, he should be liable to a denunciation to a public official (*endeixis*) and summary arrest (*apagôgê*) before the generals, and the generals should hand him over to the Eleven to be punished by death. |29.5| After that, they arranged the constitution in the following way. It is not permitted to spend the money that comes in elsewhere than on the war; all the officials are to hold office without pay as long as the war continues, except for the nine archons and whatever prytanes there

84. 413/12 BC.
85. Of Persia.
86. 411 BC.
87. Appointed in 413 BC, after the disaster in Sicily, to take over some of the functions of the council and the prytanes.
88. 22.1.

might be; these are to get three obols each per day. All the rest of the constitution is to be turned over to those Athenians who are most able to provide public service both with their bodies and with their money, not fewer than five thousand, as long as the war continues. These men are also to have the authority to make treaties with whomever they wish. And ten men over the age of forty are to be elected from each tribe to register the five thousand, swearing an oath over full-grown sacrificial animals.

30.1 The committee elected, then, drafted these things. When they had been ratified, the Five Thousand elected a hundred men from their own number to write up the constitution. Those who were elected wrote up and presented the following. |30.2| Every year those over thirty years of age should be councilors, without pay. From these should come the generals, the nine archons, the sacred recorder (*hieromnêmôn*), the regimental commanders (*taxiarchoi*), the cavalry commanders in chief (*hipparchoi*), the commanders of the tribal regiments of cavalry (*phularchoi*) and garrison commanders, the ten treasurers of the sacred funds of the goddess Athena and the other gods, and twenty Hellenic treasurers (*hellênotamiai*) to handle all the other sacred monies, and overseers of temples and sacred rites (*hieropoioi*) and supervisors (*epimelêtai*), ten each. All of these are to be elected from pre-selected candidates, pre-selecting more from those currently in the council. All the other officials are to be chosen by lot and not from the council. The Hellenic treasurers, who handle the money, should not join in sessions of the council. |30.3| For the future, four councils should be produced from the stated age group, and of these a part appointed by lot should serve as council;[89] the other men too should be distributed to each section. The hundred men should distribute themselves and the others into four parts as equally as possible and make a selection by lot, and the council should serve for a year. |30.4| They should deliberate as seems best to them about the money, so that it would be safe and spent on what was necessary, and about other matters as best they could. And if they wished to deliberate about something with more people, each man should co-opt a co-opted man, whomever he wished, of those from the same age group. They should hold the sessions of the council every five days, unless they needed more. |30.5| The nine archons should convene the council; five men appointed by lot from the council should count the votes, and of these one should be appointed by lot each day to put proposals to a vote. The five men appointed by lot should choose by lot those who wish to come before the council, first, on sacred matters, second, for heralds, third, for embassies, and fourth, for other things. War matters, whenever necessary, the generals coming forward may discuss without being chosen by lot. |30.6| A councilor who does not enter the council house at the time announced in advance owes a drachma for each day unless he gets a leave of absence from the council and is away.

89. I.e., those members of the Five Thousand, qualified by age to be in the council, should be divided into four (quarter) councils, to serve in turn.

31.1 This, then, is the constitution they wrote up for the future, but for the present, they wrote up the following one. There should be a council of four hundred in accord with the ancestral ways, forty from each tribe, from pre-selected men elected by the tribesmen from those over thirty. These men are to appoint the officials and {write something about the oath that was to be sworn},[90] and about the laws, the inspections, and the other things, do as they think to be advantageous. |31.2| It is the laws they set up about political matters that they are to use, and it should not be permitted to change them or set up others. For now the election of the generals is to be made from all the Five Thousand; but when the council is established, it should make an inspection into weapons and elect ten men [as generals] and a secretary for them, and the men elected are to exercise their offices with autocratic authority for the coming year, and if they need anything, to deliberate with the council. |31.3| They are to elect one cavalry commander in chief and ten commanders of the tribal regiments of cavalry; and for the future the council is to make the election of these in accord with what was written. For the other offices, except for the council and the generals, it is not permitted either to these or to anyone else to exercise the same office more than once. For the rest of the time, in order that the Four Hundred be distributed into the four sections, when it is possible for them to deliberate with the others,[91] the hundred men are to distribute them.

32.1 The hundred men, then, elected by the Five Thousand wrote up this constitution. When it had been ratified by the multitude, with Aristomachus putting it to a vote, the council in [the archonship] of Callias,[92] before completing its term, was dissolved on the fourteenth day of the month Thargelion,[93] and the Four Hundred entered office on the twenty-second day of Thargelion.[94] The council chosen by lot was due to enter office on the fourteenth of Scirophorion.[95] |32.2| The oligarchy was established in this way, then, in the archonship of Callias, around a hundred years after the expulsion of the tyrants.[96] The men especially responsible were Pisander, Antiphon, Phrynichus, and Theramenes—men who were both well born and seemed to be outstanding in comprehension and consideration. |32.3| When this constitution had come into being, the Five Thousand were only nominally elected, and the Four Hundred, together with the ten with autocratic authority, entered the council house and ruled the city. And they sent ambassadors to the Spartans to try to end the war on the basis of what each side possessed. But when the Spartans would not listen unless the Athenians also gave up their rule of the sea, they withdrew.

90. The text is probably corrupt.
91. 30.3.
92. 412/1 BC.
93. Around June 9.
94. Around June 17.
95. Around July 9.
96. 510 BC.

33.1 The constitution of the Four Hundred lasted, then, around four months, and of these Mnasilochus was archon for two months in the archonship of Theopompus,[97] who was archon for the remaining ten months. When the Athenians had been defeated in the sea battle near Eretria, and the whole of Euboea had revolted except for Oreus, they bore this misfortune with greater difficulty than what had gone before (for they happened to be deriving more benefit from Euboea than from Attica), and they dissolved the Four Hundred and handed over their affairs to the Five Thousand drawn from the hoplites, decreeing that no office should be a paid one. |33.2| Those most responsible for the overthrow were Aristocrates and Theramenes, who were jointly dissatisfied with what was done by the Four Hundred. For they did everything on their own, referring nothing to the Five Thousand. They seemed to have been well governed in these times, when they were in a state of war and the constitution was drawn from the hoplites.

(J) The Thirty and the Ten (34–41)

34.1 The people, then, soon deprived these men of [control over] the constitution. In the seventh year after the dissolution of the Four Hundred, in the archonship of Callias of Angele, and after the sea battle of Arginusae occurred, what happened then is, first, that the ten generals who had been victorious in the sea battle were all judged by a single vote by show of hands, although some of them had not taken part in the naval battle and others were saved on another man's ship, because the people were deceived by those who had incited their anger. Then, when the Spartans wished to withdraw from Decelea and make peace on condition that each side keep what it had, some were eager for that, but the multitude would not hear of it, because they were deceived by Cleophon, who prevented the peace from occurring by going into the assembly drunk and wearing a breastplate, claiming that he would not grant it unless the Spartans relinquished all the cities. |34.2| They did not deal with affairs well at that time, and not long afterward they recognized their mistake. For one year later, in the archonship of Alexias,[98] they had bad luck in the naval battle at Aegospotami, and as a result of that Lysander gained control of the city, and he established the Thirty in the following way. |34.3| Peace was made with them on condition that they be governed by the ancestral constitution. The democrats were trying to save the democracy, but the notables who were in the political clubs and those of the exiles who came back after the peace were eager for oligarchy, while those who took no part in any political clubs, but who otherwise seemed in no way inferior to any of the [other] citizens, were seeking the ancestral constitution. Among these were Archinus, Anytus, Cleitophon, Phormisius, and many others, and their champion was especially Theramenes. When Lysander added his support to the

97. 411/0 BC.
98. 405/4 BC.

oligarchs, the people were panic-stricken and compelled to vote by show of hands for the oligarchy. Dracontides of Aphidna wrote the decree.

35.1 That is the way, then, in which—in the archonship of Pythodoros[99]—the Thirty were installed. When they had gained control of the city, they disregarded the other things that had been decided about the constitution, but installed five hundred councilors and the other officials from a thousand pre-selected men; and, choosing as their allies ten governors of Piraeus, eleven guards of the prison, and three hundred whip-bearing attendants, they held the city by themselves. |35.2| At first, they were moderate to the citizens and pretended to aim at the ancestral constitution. They took down from the Areopagus the laws of Ephialtes and Archestratus about the Areopagites; and they dissolved those statutes of Solon that admitted grounds for dispute as well as the authority which lay with the judges, on the pretext they were "straightening" the constitution and making it free of disputes. For example, concerning bequeathing one's property to whomever one wishes, they gave men that power once and for all, taking away the attached difficulties ("unless because of madness or old age, or being persuaded by a woman"), so that there would be no opening for sycophants. They did likewise in other cases too. |35.3| Initially, then, these are the things they did, and they got rid of the sycophants and those associating with the people in order to curry favor with them contrary to what was best, and who were evildoers and wicked. And the city was pleased at these deeds, thinking that they were acting for the sake of the best. |35.4| But when they had a stronger hold on the city, they kept their hands off none of the citizens, but killed those who were distinguished by their property, family, and reputation, cunningly doing away with [the sources of] their fear and wishing to plunder their property; and after a short time had passed they had killed no fewer than one thousand five hundred.

36.1 With the city declining in this way, Theramenes, annoyed at what was occurring, urged them to cease their wanton violence and give a share in affairs to the best men. At first, they opposed this; but when word had spread to the multitude and the many were well-disposed to Theramenes, fearing that by becoming champion of the people he would dissolve their dynasty, they registered three thousand of the citizens, so as to give them a share in the constitution. |36.2| Again Theramenes also objected to this, first, because they wished to give a share in the constitution to the decent men but were giving it only to three thousand, as if virtue were limited to this number, and then because they were doing two entirely contrary things, establishing a violent rule and also making themselves weaker than those who were ruled. They paid no heed to this, but for a long time delayed the register of the Three Thousand, and kept to themselves those they had decided on. But when it seemed best to them to publish this, they erased some of those written on the list, and inserted instead some of those excluded.

99. 404/3 BC.

37.1 Once winter had set in, Thrasyboulus with the exiles seized Phyle, and things went badly for the expedition that the Thirty led out. They then decided to deprive the others[100] of their weapons, and to destroy Theramenes in the following way. They introduced two laws to the council, ordering it to vote for them by show of hands: one of these gave the Thirty autocratic authority to put to death those of the citizens not included in the register of the Three Thousand; the other prevented from participating in the present constitution those who had destroyed the walled fort at Eëtioneia or done anything against the Four Hundred who had established the previous oligarchy. It was in both of these that, as it happened, Theramenes had taken part, so that when the two laws were ratified the result was that he was outside the constitution and the Thirty had the authority to execute him. |37.2| When Theramenes was killed, they deprived all except the Three Thousand of their weapons, and in other respects advanced greatly toward savagery and wickedness. They sent ambassadors to Sparta and both spoke against Theramenes and asked the Spartans for aid. Having heard them, the Spartans sent Callibius as governor and around seven hundred soldiers, who came to the Acropolis and guarded it.

38.1 After that, the men from Phyle captured Munichia and defeated in battle those who came to aid the Thirty. The men from the city proper withdrew after the dangerous venture and the next day crowded into the marketplace, abolished the Thirty, and elected ten of the citizens with autocratic authority for ending the war. But, on taking over the rule, they did not do the things for which they had been elected, but sent envoys to Sparta to summon aid and borrow money. |38.2| Those in the constitution took this badly; but the Ten, afraid that they would be overthrown from their rule and wishing to strike terror in the others (which in fact occurred), arrested Demaretus, who was second to none of the citizens, and put him to death. And so they kept a stable hold on affairs, with Callibius and the Peloponnesians who were present fighting alongside them and, in addition to these, some of those in the cavalry; for some of these were among the citizens most eager that those from Phyle not return. |38.3| But those holding Piraeus and [the hill of] Munichia, once all the people defected to them, prevailed in the war. They then abolished the first Ten elected and elected another Ten, whom they thought to be the best men, with the result that under them settlements were reached and the people returned, with these men eagerly fighting alongside them. Their leading champions were especially Rhinon of Paeania and Phayllus of Acherdus. For before Pausanias arrived these men made overtures to those in Piraeus, and when he arrived, they sent messages to those in Piraeus and eagerly supported their return. |38.4| For Pausanias, king of the Spartans, together with the ten mediators later arriving from Sparta, whom he himself encouraged to come, brought to completion the peace and the settlements. Rhinon and his colleagues were praised because of their goodwill toward the people:

100. 37.2.

they received their commission under the oligarchy, but they submitted their inspections under the democracy, and no one—either among those who remained in the city proper or among those who had come back from Piraeus—made any complaint against them. On the contrary, Rhinon was also immediately elected general because of this.

39.1 The settlements were reached in the archonship of Eucleides,[101] in accord with the following agreements. Of the Athenians who had remained in the city proper, those wishing to emigrate are to live in Eleusis with citizen status, control and autocratic authority over their property, and receipt of their revenues. |39.2| The sanctuary is to be common to both sides, and the Ceryces and the Eumolpidae[102] are to take care of it in accord with ancestral tradition. It is not permitted for those from Eleusis to go to the city proper [of Athens] or for those from the city proper to go to Eleusis, except for the sacred Mysteries in the case of each. They are to contribute to the alliance[103] from their income just like the other Athenians. |39.3| If any of those departing take a house at Eleusis, they are to persuade the owner; if they happen not to agree with each other, each is to choose three assessors, and are to accept whatever price these men fix. Of the Eleusinians, those whom the [emigrants] wish are to share the same house with them. |39.4| There is to be a registration for those who wish to emigrate: for those at home, within ten days from when they swore the oaths and twenty days from their emigration; for those away, on these same terms, from when they arrived home. |39.5| It is not permitted for a man living in Eleusis to hold any of the offices in the city proper before he registers again in the city proper. Trials for murder, if anyone has killed or wounded someone by his own hand, are to be in accord with ancestral ways. |39.6| It is not permitted for anyone to bring up past evils, except against the Thirty, the Ten, the Eleven, and those ruling Piraeus, and not even against these if they submitted inspections. Those who ruled in Piraeus should submit inspections among those in Piraeus, and those in the city proper among those who satisfied property assessments. Those who are not willing to do so, on this basis, should emigrate. The money they borrowed for the war each side is to give back separately.

40.1 When the settlements had been reached in this way, those who had fought on the side of the Thirty were afraid, and many, though thinking of emigrating, were delaying their registration until the last days, as everyone is inclined to do. Archinus, seeing the numbers and wishing to hold them back, canceled the remaining days for registration, so that many people would be forced to remain involuntarily, until they gained in confidence. |40.2| And in this Archinus seems to have administered things well; and also after that when he brought a writ of illegality against the decree of Thrasybulus, which granted citizenship to all those who joined in the return from Piraeus, some of whom

101. 403/2 BC.
102. f2.
103. Of Athens with Sparta after 404 BC.

were manifestly slaves; and thirdly, when someone began to bring up the past evils of those who had returned, by bringing him before the council and persuading it to put him to death without a trial.[104] He said that now they could show if they wished to save the democracy and abide by their oaths; for by letting him go they would encourage the others too, but if they put him to death, they would set an example for all. And this is in fact what happened; for when he had been put to death, nobody later ever brought up past evils. |40.3| But they seem to have dealt with their past misfortunes in the best and most truly political way of all, both individually and collectively; for not only did they wipe out accusations about earlier matters, but also the money which the Thirty took for the war they collectively gave back to the Spartans, although the agreements stipulated that each side, those from the city proper and those from Piraeus, pay back separately, because they thought this must be the first starting-point of their concord. In other cities, by contrast, not only do democrats who win power not make payments from their personal property, but they also redistribute the land. |40.4| They also reached a settlement with those who had moved to Eleusis, in the third year after their emigration, in the archonship of Xenaenetus.[105]

(K) The Conclusion to the First Part

41.1 That, then, is what happened to occur in later times; but it is at this point that the people gained the control of affairs and established the current constitution, in the archonship of Pythodorus,[106] when the people seem to have justly taken hold of the constitution, because the people had brought about their return[107] on their own. |41.2| Of the changes, this was the eleventh in number. For the first modification of what was there initially was that of Ion[108] and those who settled with him; for that was when they were first distributed among the four tribes and established the four tribal kings.[109] The second, and the first after that to have the order of a constitution, was that under Theseus, inclining slightly away from the kingly. After that, was the one under Draco, in which they also first wrote up laws. The third was the one after the faction, the one under Solon, from which came the starting-point of democracy. Fourth was the tyranny under Pisistratus. Fifth, after the overthrow of the tyrants, was the one under Cleisthenes, more democratic than that of Solon. Sixth was the one after the Persian Wars,[110] with the council of the Areopagus in charge. Seventh, and after that, was the one that Aristides pointed to and Ephialtes completed when he overthrew the council

104. Something forbidden by law.
105. 401/0 BC.
106. 404/3 BC.
107. 38.2.
108. f1.
109. 8.3.
110. 23.1.

of the Areopagus: what happened in it was that because of the popular leaders the city made the worst mistakes because of its rule of the sea. Eighth was the establishment of the Four Hundred, and after that, ninth, was the democracy again. Tenth, the tyranny of the Thirty and the Ten. Eleventh, the one after the return from Phyle and out of Piraeus, from which time it has continued until the present one, always adding to the power of the multitude. For the people themselves have made themselves to control everything, and they manage everything by decrees and by the courts, in which it is the people that have the power; for even the judgments of the council have passed into the hands of the people. And this they seem to do correctly; for the few are more easily corrupted, both by profit and by favors, than the many. |41.3| At first, they refused to make the assembly a paid office; but when people were not attending the assembly, and the prytanes tried clever devices to make the multitude attend for voting to be ratified, first, Agyrrhius provided an obol, and after him Heracleides of Clazomenae, who was called "king," two obols, and Agyrrhius again, three obols.

(L) Registration and Training of Citizens (42)

42.1 The present way the constitution is established is as follows. It is those born from two citizens who participate in the constitution and are registered among their demesmen when they are eighteen years old. When they are registered, the demesmen, having sworn an oath, take a vote about them: first, as to whether they seem to have reached the age required by the law, and if they do not seem so, they go back again among the boys; second, as to whether a boy is free and has been born in accord with the laws. Then, if they vote to reject him as not being free, he appeals to the court, while the demesmen elect five men from among themselves as accusers, and if he does not seem to have been registered justly, the city sells him into slavery; but if he wins, it is obligatory for the demesmen to register him. |42.2| After that, the council examines those who have been registered, and if anyone seems to be younger than eighteen years, it punishes the demesmen who registered him. When the ephebes[111] have been examined, their fathers gather by tribes, swear an oath, and elect three of the tribesmen who are over forty years old, whom they consider to be the best and most suitable, to take care of the ephebes, and from these the people elect one man from each tribe as temperance-guardian (*sôphronistês*), and from the other Athenians an order-keeper (*kosmêtês*) over all of them. |42.3| Taking the ephebes, these men first go around to the holy places, and then proceed to Piraeus, where some guard [the hill of] Munichia, some [the peninsula of] Acte. The people also elect two coaches for them, and teachers who teach them to fight in hoplite armor, shoot arrows, throw javelins, and fire catapults. They also give the temperance-guardians one drachma each for their food, and to the ephebes four obols each. Each temperance-guardian takes the money of his tribesmen and buys the provisions for all of them in common (for

111. The young men who have passed examination.

they mess together by tribes), and takes care of all the other things. |42.4| And in this way they spend the first year. The next year an assembly is held in the theater,[112] where they demonstrate their military drills to the people. After receiving a shield and a spear from the city, they patrol the countryside and spend their time in the guardhouses. |42.5| They guard for two years, wearing short cloaks, and are exempt from everything else; and in order that there be no excuse for being away, they neither bring a lawsuit nor have one brought against them, except concerning inheritance and heiresses,[113] or if a priesthood in accord with their family came up for anyone. After the two years have passed, they at that point are with the others.

(M) Officials and the Council (43–49)

43.1 Matters concerning the registration of the citizens and the ephebes, then, are this way. All the officials for routine management they make chosen by lot, except for the treasurer of the military fund, those in charge of the festival fund, and the one in charge of the fountains: these they elect, and those elected hold office from Panathenaic festival to Panathenaic festival. They also elect all the offices for war. |43.2| The council is of 500 chosen by lot, 50 from each tribe. Each of the tribes is prytane in turn, in accord with the lot they have drawn; the first four serve for 36 days each, the later 6 for 35 days each (for they regulate the year in accord with the moon). |43.3| The prytanes first eat together in the Tholus, receiving money from the city; then they convene both the council and the people: the council every day, except if there is some day of exemption, the people four times in each prytany. And these men prescribe how many things the council must deal with, what on each day, and where to meet. |43.4| These men also prescribe the assemblies. One is the assembly with full control, in which it is necessary to vote on whether the officials appear to be conducting their offices well, and to transact business concerning wheat[114] and concerning guarding the territory, and on this day those who wish are to make indictments, and schedules of publicly confiscated property, distributions of inheritances, and heiresses are to be read out, so that none escapes notice without being claimed. |43.5| In the sixth prytany, in addition to what has been said, they also hold a vote on ostracism, as to whether it seems they should hold one or not, and on preliminary accusations (*probolai*) against sycophants, Athenians, and resident aliens, up to three of each, and whether anyone having promised something to the people has not kept his promise. |43.6| A second assembly is for supplications, in which whoever wishes makes a supplication about whatever he wishes, whether private or public, and speaks to the people. The other two assemblies are for other matters, in which the laws order that they should transact three sacred items, three for heralds and

112. Of Dionysus.
113. A woman could not represent herself in court, so a relative among the ephebes might have to represent her.
114. Athens depended on imported wheat.

embassies, and three secular. Sometimes they also transact business without a prior vote. Heralds and ambassadors approach the prytanes first, and those bringing letters give them to these men.

44.1 There is a single chairman of the prytanes appointed by lot. He is chairman for a night and day, and it is not possible either to be one for more time, or for the same man to be one twice. He watches over both the keys of the holy places where the money and documents of the city are kept and the public seal, and it is necessary for him, and for a third of the prytanes whom he orders to do so, to remain in the Tholus. |44.2| And whenever the prytanes bring together the council or the people, he chooses by lot nine presiding officials (*proedroi*), one from each tribe except for the tribe in prytany, and again from these one chairman, and he hands over the agenda to them. |44.3| Taking it over, they are in charge of good order, and put forward the things to be transacted, and they judge the votes conducted by show of hands, manage all the other things, and have the authority to dismiss the meeting. And it is not possible to be chairman more than once in the year, but it is possible to be the presiding official once in each prytany. |44.4| They also hold in the assembly elections of generals, cavalry commanders, and the other war officers, in accord with what seems best to the people. The prytanes do this after the sixth prytany in whose term there are good omens. There must be a preliminary vote about this too.[115]

45.1 The council previously had authority to punish with fines, imprison, and condemn to death. And when it was taking Lysimachus to the public executioner and he was already sitting there and about to be put to death, Eumelides of Alopece took him away saying that none of the citizens should die without the judgment of a court. And when judgment in the court took place, Lysimachus was acquitted and gained the nickname "the one who escaped the garotte." And the people took away from the council the power to execute, imprison, or punish with fines, and it set up a law that if the council condemned anyone for wrongdoing or fined him, the thesmothetae[116] are to present the condemnations and proposals for punishment to the court, and whatever the judges voted, that is what should have authority. |45.2| The council judges most of the officials, and especially those who handle money. The judgment does not have final authority, but may be referred to the court. It is also possible for private citizens to make an indictment for not following the laws against any of the officials they wish. These men may also appeal to the court if the council condemns them. |45.3| It also examines the men who will be councilors the next year and the nine archons. Previously, it had the authority to reject them, but now these men can appeal to the court. |45.4| In these matters, then, the council does not have control. It conducts a preliminary deliberation for the people, and it is not possible for the people to decree anything

115. 45.4.
116. 59, 63–65.

without it being the object of a preliminary deliberation or anything the prytanes have not prescribed. For the man who succeeded [in proposing a decree that had not been approved by the council] was liable to a writ of illegality.

46.1 The council also takes care of the triremes that have been built, and the equipment and the ship-sheds, and it builds new triremes and quadriremes, whichever the people vote, and equipment and ship-sheds for these. The people elect architects for the ships. If they do not hand over the ships fully completed to the new council, they cannot take their award;[117] for they take it under the next council. The council produces the triremes, choosing ten men from itself as trireme-makers. |46.2| It also inspects all the public buildings, and if anyone seems to have done wrong, it reports this person to the people, and once it convicts him, it hands him over to a court.

47.1 The council also co-manages most things with the other officials. First, there are the ten treasurers of Athena, one chosen by lot from each tribe, from the five-hundred-bushel-men, in accord with the law of Solon[118] (for that law is still in effect), but the one who is appointed by lot is the official even if he is very poor. They take over the statue of Athena, the Victories, the rest of the ornamentation, and the money, in the presence of the council. |47.2| Next, the commissioners for public contracts (*pôlêtai*) are 10 in number, one chosen by lot from each tribe. They, together with the treasurer of the military fund and the men elected for the festival fund, let all the leases and sell [the workings of] the mines and the [collecting of] taxes,[119] in the presence of the council. And they ratify those to whom the council voted [the workings of] the mines that are sold (the ones in working condition sold for three years, the abandoned ones sold for seven years), and they sell the properties of those exiled by the Areopagus and the others, in the presence of the council, and the 9 archons ratify them. And the ones sold for a year, after writing up on whitened boards the buyer and how much they were sold for, they hand over to the council. |47.3| They write up separately, on ten writing boards, those who must pay each prytany, and separately those who must pay three times a year, making a writing board for each payment, and separately those who must pay at the ninth prytany. They write up also the lands and the houses that have been registered and sold in the court; for they sell these things too. For houses, it is necessary to pay the price in 5 years, for the lands in 10. They pay these in the ninth prytany. |47.4| Also, the king archon[120] presents the leases of sacred lands, having written them up on whitened boards. The lease for these is also for ten years, and the payment is made in the 9th prytany. That is why indeed most of the money is collected in this prytany. |47.5| The boards written up in accord with the payments are then brought in to the council, and the public slave keeps watch over them. When there is a payment of

117. A gold crown.
118. 7.4.
119. 43.1.
120. 57.

money, he hands over these particular boards to the receivers (*apodektai*), taking down from the racks those whose money on that day must be paid and erased. The others are kept separately, in order that they are not erased before [the debt is paid].

48.1 There are ten receivers, corresponding to the tribes, chosen by lot. These take the boards and wipe off the money paid, in front of the council in the council house, and they give back the boards to the public slave. And if anyone misses a payment, he is inscribed there, and it is necessary that he pay double what is missing or be imprisoned, and the council has the authority to exact this and to imprison, in accord with the laws. |48.2| On the first day, they receive all the payments and divide them among the officials. On the next day, they introduce the division of payments, after writing it on a tablet and registering it in the council house. They call for anyone in the council who knows anyone who has been unjust as regards the division, whether an official or a private citizen, and they put motions to the vote if anyone seems to have done something unjust. |48.3| The councilors also choose by lot ten auditors (*logistai*) from among themselves to check the accounts of the officials in each prytany. |48.4| They also choose by lot inspectors (*euthunoi*), one for each tribe, and 2 assistants (*paredroi*) for each of the inspectors, who must sit by the eponymous hero[121] of each tribe in market hours. If anyone wishes to invoke a private or public inspection against any of those who have submitted inspections in the court, within 30 days, he writes on a whitened board his own name, that of the defendant, and the offense he accuses him of, adds the assessment (whatever seems correct to him), and gives it to the inspector. |48.5| The inspector takes it and reads it. If he convicts, he hands over private matters to the deme judges who are judging cases for the relevant tribe, and registers public ones with the thesmothetae. The thesmothetae, for their part, if they take it over, present the inspection in the court again, and whatever the judges decide, this is what has authority.

49.1 The council also examines the horses, and if anyone with a good horse seems to maintain it badly, it fines him the food allowance.[122] It brands a wheel on the jaw of those horses that are unable to keep up, or are unwilling to stay in position, but instead retreat, and the horse that has undergone this is not approved. It also examines the mounted skirmishers (*prodromoi*), to see which seem to it to be suitable to skirmish, and if it votes anyone out, this person is deprived of his horse. It also examines the infantry that serves with the cavalry (*hamippoi*) and if it votes anyone out, he ceases to receive his pay. |49.2| The commissioners of registration (*katalogeis*), ten men whom the people elect, register and hand over the names of those they register as cavalrymen to the cavalry commanders in chief and the commanders of the tribal regiments of cavalry, and these men take up and carry the register to the council. They open the tablet on which the names of the cavalrymen have been sealed up. They excuse those who had

121. 21.6.
122. Cavalry horses were publicly subsidized.

been previously registered who swear under oath that they are unable in body or in property to be cavalrymen; and they summon those who have been registered, and if anyone swears under oath that he is unable in body or in property to be a cavalryman, they release him; as for the one who does not swear an oath of release, the councilors vote on whether he is suitable to be a cavalryman or not. If they vote that he is, they register him on the tablet; if not, they release him too. |49.3| The council once judged the patterns and the robe (*peplos*) [for the Parthenon Athena], but now the court appointed by lot does so; for the councilors were thought to employ favoritism in their judgment. And jointly with the treasurer of the military fund it takes care of the production of the Victories and the prizes for the Panathenaic festival. |49.4| The council also examines invalids. For there is a law that orders those who possess less than three minas, and are maimed in their bodies so they can do no work, to be examined by the council and each given two obols per day for sustenance from public funds. And there is a treasurer for them assigned by lot. |49.5| And the council, jointly with the other officials, manages (one might almost say) most things.

(N) Annual Officials (50–54)

50.1 These, then, are the things managed by the council. Also chosen by lot are repairers of sacred things, ten men who take thirty minas from the receivers and repair those of the temples that especially need it. |50.2| Also ten city managers (*astunomoi*), 5 of whom hold office in Piraeus, five in the city proper. These see to it that the pipe-girls, harp-girls, and lyre-girls are not hired for more than two drachmas, and if more are eager to employ the same girl, these men hold a lottery and hire her out to the man chosen by lot. And they take care that none of the dung collectors deposit dung within 10 stades of the city wall. And they prevent building above the streets, extending balconies over the streets, making overhead drainpipes that have spouts into the street, or shutters opening into the street. And they pick up those who die in the streets, having public attendants for this.

51.1 Also chosen by lot are 10 market managers (*agoranomoi*), five for Piraeus and 5 for the city proper. These are commanded by the laws to take care of all things sold, so that they will be sold pure and unadulterated. |51.2| Also chosen by lot are 10 managers of weights and measures (*metronomoi*), five for the city proper, 5 for Piraeus, and these take care of all measures and weights, so that the sellers will use standards that are just. |51.3| There used also to be 10 grain guardians (*sitophulakes*) chosen by lot, five for Piraeus, five for the city proper, but now there are twenty for the city proper, fifteen for Piraeus. These take care, first, that the unground grain in the market be sold justly, then that the millers sell barley meal in accord with the price paid for the barleycorns and the bread-sellers their loaves in accord with the price paid for the wheat, and at the weight that the grain guardians assign, for it is them that the law tells to assign it. |51.4| They

choose by lot ten caretakers of the market. These men are ordered to take care of the markets, and to force the importers to convey to the city proper two-thirds of the grain brought by ship to the grain market.

52.1 They also appoint by lot the Eleven, who are to take care of those in the prison, and to punish with death the thieves, kidnappers, and highwaymen brought in under summary arrest, if they confess; but if they dispute it, they are to present them in court, and if they are acquitted to let them go, but if not, then to put them to death. They are also to present in court the lands and houses registered for confiscation, and to hand over to the commissioners for public contracts things judged to be public. And they are to present the denunciations, for it is the Eleven who also present them, though the thesmothetae also present some denunciations. |52.2| They also choose by lot presenters (*eisagôgeis*), 5 men who present the monthly suits, each one for two tribes. The monthly suits are for a dowry, if someone owes it and does not pay; if anyone borrows at a drachma interest[123] and defaults; if anyone wishing to work in the market borrows capital from someone; further, suits concerning assaults, friendly loans, partnerships, slaves, yoke animals, ship commanders,[124] and banking. |52.3| These men present these, then, and try them as monthly suits, while the receivers (*apodektai*) present suits by tax collectors and against tax collectors, having authority in cases up to ten drachmas, and presenting the others in court as monthly suits.

53.1 They also choose by lot the Forty, four from each tribe, before whom other suits are brought. Previously, they were thirty, and went around the demes judging cases, but after the oligarchy of the Thirty they became forty. |53.2| In cases up to ten drachmas they have final authority to judge, but cases over that valuation they hand over to the public arbitrators (*diaitêtai*). They take over these cases and, if they cannot bring the parties to a resolution, decide them, and if the decisions are satisfactory to both sides and they abide by them, the case is completed. But if either of the litigants appeals to the court, they insert the testimonies, challenges, and laws into clay jars, those of the prosecutor and those of the defendant separately, seal these up, attach the judgment of the arbitrator written on a board, and hand them over to the 4 who are trying cases for the tribe of the defendant. |53.3| These men take them over and present them in the court: those up to a thousand drachmas to a court of two hundred and one, those over a thousand to a court of four hundred and one. It is not possible to use laws, challenges, or testimonies except those inserted in the clay jars by the arbitrator. |53.4| The arbitrators are men in their sixtieth year: this is clear from the archons and the eponymous heroes; for there are ten eponymous heroes of the tribes, and forty-two heroes of the age-groups. The ephebes,[125] when they were being registered, used to be

123. Per mina.
124. 61.1.
125. 42.1.

registered on whitened boards, together with the name of the archon in whose year they were registered and the hero of the age-group which had provided the arbitrators of the previous year. Now, though, they are registered on a bronze pillar, and the pillar is set up in front of the council house, near the [statues of the] tribal heroes. |53.5| Taking the last of the eponymous heroes the Forty distribute the arbitrations to the men and draw lots as to which of the cases each one is to arbitrate. And it is necessary for the arbitrators to complete the arbitrations that each one has been assigned by lot. For the law orders that if anyone fails to become arbitrator when his age-group is reached, he is to be deprived of his citizen status, unless he happens to be holding some office or else to be abroad: these alone are exempt. |53.6| It is possible to make an indictment to the group of arbitrators if one is wronged by the arbitrator, and if they convict anyone, the laws order that he be deprived of his citizen status; but appeal is possible for these men too. |53.7| They use the eponymous heroes also for military campaigns, and when they send out an age-group they prescribe which age-groups, dating from one archon and hero to another, must go on the campaign.

54.1 They also choose by lot the following officials. Five road-builders, who are charged with repairing the roads, having at their disposal public workmen. |54.2| And ten auditors (*logistai*) and ten advocates (*sunêgoroi*) for them, before whom it is necessary for all those who have held offices to render their accounts. For these men alone audit the accounts of those subject to inspection and present the inspections in the court. And if they establish that someone is embezzling, the judges condemn him for embezzlement, and he pays the amount decided tenfold. And if they show that someone has taken gifts as bribes and the judges condemn him, they assess the size of the gifts, and this too is paid tenfold. If they condemn for [other sorts of] injustice, they assess the injustice done, and this is repaid simply if someone pays before the 9th prytany.[126] If not, it is doubled. But the tenfold payment is not doubled. |54.3| They also choose by lot the secretary (*grammateus*), called "the secretary by the prytany," who has authority over the documents, guards the decrees that have been passed, copies down everything else, and sits in attendance on the council. Previously, he was elected, and they used to elect the best-reputed and trustworthy men; indeed, he is recorded on the marble pillars concerned with alliances, agents, and grants of citizenship. Now he is chosen by lot. |54.4| They also choose by lot another secretary "for the laws," who sits in attendance on the council, and he also copies down all the laws. |54.5| And the people elect a secretary to read things aloud to them and to the council, and he has authority over nothing except the reading. |54.6| The people choose by lot ten performers of sacred rites (*hieropoioi*), called "for the expiatory sacrifices," who perform the sacrifices ordered by oracles, and if there is a need to seek favorable omens, they seek favorable omens together with the prophets. |54.7| The people also choose by lot ten others, those called "yearly," who perform certain sacrifices and manage all the four-year festivals except the Panathenaea.

126. 47.3.

The four-year festivals are, first, that to Delos, where there is also a seven-year festival, second, the Brauronia, third, the Heracleia, fourth, the Eleusinia, and fifth, the Panathenaea; and none of these occur in the same year. Now the Hephaestia has also been added, in the archonship of Cephisophon.[127] |54.8| They choose by lot an archon for Salamis and a demarch[128] for Piraeus, who conduct the Dionysia in each place and appoint the patrons (*chorêgoi*). In Salamis the name of the archon is also written up.

(O) The Archons (55–59)

55.1 Those officials are chosen by lot and have authority over all the matters stated. As for those called "the nine archons," the way in which they were initially appointed has been stated. Now they choose by lot six thesmothetae,[129] a secretary for these men, and, further, an archon, a king archon, and a polemarch, one of them in turn from each tribe. |55.2| These are examined first in the council of 500, except for the secretary. He is examined only in a court like the other officials (for all the officials, both the ones chosen by lot and the ones elected, take office only after being examined). The nine archons, on the other hand, are examined in the council and again in a court. Previously, anyone the council rejected in the examination did not take office, but now there is appeal to the court, and this has authority over the examination. |55.3| When they examine them, they first ask "Who is your father and from which of the demes, and who is the father of your father, and who is your mother, and the father of your mother, and from which of the demes?" After that, they ask if he has a cult of Ancestral Apollo and Household Zeus and where these shrines are; then if he has family tombs and where these are; then if he treats his parents well, pays his taxes, and has performed his military service. When they have asked this, [the official in charge] says, "Call the witnesses to these things." |55.4| When the candidate has provided his witnesses, he asks, "Does anyone wish to accuse this man?" If there is an accuser, he grants an accusation and a defense, and then grants a vote by hand in the council or by ballot in the court. If nobody wishes to accuse, he immediately grants the ballot. Previously, one man threw in his ballot, but now it is obligatory for all to vote about them, so that if some wicked man has gotten rid of his accusers, it would be for the judges to reject him at his examination. |55.5| Having been examined in this way, they proceed to the stone on which the cut-up sacrificial animals are placed, and on which also the arbitrators, having sworn, declare their arbitrations and witnesses swear their testimony under oath. Climbing up on this, they swear that they will exercise their office justly and in accord with the laws, and not take gifts as bribes on account of their office, and if they do take something, to dedicate a gold statue. From there, those who have sworn proceed to the Acropolis and there swear the same things again, and after that they enter office.

127. 329/8 BC.
128. 21.5.
129. 3.4–5, 63–65.

56.1 The archon, the king archon, and the polemarch each take two assistants, whomever they wish, and these are examined in the court before assisting, and they submit inspections when they have finished assisting. |56.2| And the archon, immediately on entering office, first proclaims that all the things anyone had before he entered office he will have and control until the end of his office. |56.3| Next, he appoints three patrons from the richest men of all the Athenians for the tragedians. Previously, he also appointed five for the comic dramatists, but now the tribes supply these. Next, he receives the patrons provided by the tribes for the Dionysia, for men, boys, and comic dramatists, and for the Thargelia, for men and boys (those for the Dionysia are appointed by tribe, those for the Thargelia one for two tribes and each of the two tribes supplies the patron in rotation). For these he conducts exchange of property trials (*antidôseis*) and presents claims for exemption from public service (*skêpseis*), if anyone says that he has done this public service previously, or that he is exempt because he has done another public service and his period of exemption has not yet expired, or that he is not yet of the age required (for a man who is a patron for boys must be over forty). The archon also appoints patrons for Delos and the chief of a sacred mission (*architheôros*) for the thirty-oar ship that takes the young men. |56.4| He takes care of processions: that for Asclepius, when the initiates stay at home, and for the Great Dionysia together with the caretakers (*epimelêtai*)—previously the people elected ten caretakers and they used to pay for the expenses for the procession by themselves, but now they choose by lot one for each tribe and give a hundred minas toward the equipment. |56.5| He also takes care of the procession to the Thargelia and that for Zeus the Savior. He also administers the competitions at the Dionysia and the Thargelia. These, then, are the festivals that he takes care of. |56.6| Public writs (*graphai*) and private suits (*dikai*) are also assigned by lot to him, which, after holding a preliminary hearing (*anakrisis*), he presents in the court: for mistreatment of parents (these cases are without penalty for whoever wishes to prosecute); for mistreatment of orphans (these are against the guardians); for mistreatment of an heiress (these are against guardians and husbands); for mistreatment of an orphan's estate (these are also against the guardians); for insanity, if anyone accuses someone of wasting his ancestral estate while insane; for the appointment of liquidators (*datêtai*), if anyone is not willing to have common property distributed; for the appointment of a guardian; for a suit to decide between claimants (*diadikasia*) to a guardianship; for settlement in open court;[130] for registering oneself as a guardian; for suits pertaining to inheritances (*epidikasiai*) and to heiresses. |56.7| He also takes care of orphans and heiresses, and of women who claim to be pregnant when their husbands die; and he has authority to impose penalties on those who do injustice, or to present them in court. He also leases out the estates of orphans and heiresses until they are fourteen; and he receives the valuations [of the land that lessees provide as security]; and if the guardians do not provide food for the boys, he exacts it.

130. Requiring the production of property or title for the judges and claimants to see.

57.1 These are the things the archon takes care of. The king archon, first, takes care of the Mysteries along with the caretakers whom the people elect, two from all Athenians, one from the Eumolpidae and one from the Ceryces. Next, of the Dionysia at the Lenaean. This is a procession and a contest. The king archon and the caretakers together send off the procession, while the king archon organizes the contest. He also arranges all the torch contests, and he manages (one might almost say) all the ancestral sacrifices. |57.2| Public suits are brought before him: for impiety and if anyone has a dispute with someone about a priesthood. He also adjudicates all disputes over sacred matters for the families and the priests. Also, all the private suits for homicide are brought before him, and he is the one who makes the proclamation of exclusion from the things specified in the laws.[131] |57.3| Private suits for homicide and wounding, if anyone kills or wounds with premeditation, take place at the Areopagus, and for administering poison, if the person administering it kills, and for arson; for the council [of the Areopagus] tries only these cases. Trials for involuntary cases, for conspiracy, and if anyone kills a servant, a resident alien, or a foreigner, are at the Palladium. If anyone admits to having killed, but says that it was in accord with the laws, such as catching a seducer, in ignorance in war, or while participating in an athletic contest, they judge his case at the Delphinium. If he has gone into exile for an offense that admits of reconciliation and is accused of killing or wounding someone, they try him at Phreatus. He defends himself in a boat anchored near the shore.[132] |57.4| The 51 men appointed by lot judge these cases, except when trials take place at the Areopagus: the king archon presents the case, and they judge them in a holy place and in the open air, and when the king archon judges them he takes off his crown. The accused at other times is excluded from the holy places, and it is not lawful for him to encroach upon the marketplace; but at this time he goes into the holy place and defends himself. When the prosecutor does not know who did it, he obtains a hearing against "the [unknown] doer." The king archon and the tribal kings[133] also judge cases against inanimate objects and animals other [than human beings].[134]

58.1 The polemarch makes the sacrifices to Artemis the Huntress and to Enyalius, he organizes the funeral contest over those who have died in war, and he performs the heroes' rites for Harmodius and Aristogeiton. |58.2| Private suits—for resident aliens, for foreigners allowed to rank with citizens in some respects (*isoteleis*), and for agents—are brought before him alone: he must take these, divide them into ten parts, and deliver to each tribe one part assigned by lot, and those judging for each tribe must hand them over to the arbitrators. |58.3| For resident aliens he presents suits for quitting their sponsor or not having a sponsor, and for estates and heiresses, and however many other things the archon does for citizens, the polemarch does for the resident aliens.

131. On the assumption that if the accused is guilty he is polluted (*miasma*) and a danger to the city.
132. To protect Attica from being contaminated by the pollution thought to adhere to murderers.
133. 8.3, 41.2.
134. Either of which might be polluted by bloodshed.

59.1 The thesmothetae first have the authority to prescribe the law courts, on what days they must hold trials, and then of assigning cases to the officials; for as they assign them, so the officials deal with them. |59.2| Next, they present indictments for those who bring indictments to the people, all hostile votes, preliminary accusations,[135] writs of illegality and for passing an unsuitable law, those against presiding officials and chairmen,[136] and inspections for generals. |59.3| Also directed to them are public writs in which a deposit is paid by the prosecutor: for being a foreigner [while posing as a citizen]; for bribery by a foreigner, when through bribery someone escapes the charge of being a foreigner; for sycophancy; for bribery; for false registration [of someone as a public debtor]; for false attestation [that someone had been summoned by a court]; for failing to delete a discharged debtor from the list; for failing to register someone [as a public debtor]; and for adultery. |59.4| They also present the examinations for all the officials, and [appeals by] men rejected as citizens by their demesmen, and convictions forwarded from the council. |59.5| They also present private suits, trading suits, mining suits, and suits against any slave who speaks badly of a free man. And these men also assign by lot the private and public courts to the officials. |59.6| They also ratify the judicial treaties with [foreign] cities, and present the suits arising from these treaties, and charges of false witness from the Areopagus. |59.7| All the nine archons choose by lot the judges, the tenth being the secretary of the thesmothetae, each from those of his own tribe.

(P) The Commissioners of Games (60)

60.1 Matters concerning the 9 archons, then, are arranged in this way. The people also choose by lot ten men as commissioners of games (*athlothetai*), one from each tribe. After undergoing their examinations, they hold office for four years, and they manage the Panathenaic procession, the music contest, the gymnastic contest, and the horse race, they have the robe for the Parthenon Athena made, and together with the council [of Five Hundred] have the amphoras made, and give the olive oil to the athletes. |60.2| The olive oil is collected from the sacred olive trees. The archon levies it from those who possess the lands where the sacred olive trees are, three half-cotyles from each plant. Previously, the city used to sell the fruit, and if anyone dug up a sacred olive tree or cut one down, the council of the Areopagus judged him, and if they should condemn him, they punished him with death. But ever since the owner of the land pays the olive oil as a tax, though the law remains, the trial has gone out of use, and the city [now] gets the olive oil on the basis of the property, not on the basis of the [individual] plants. |60.3| The archon collects what was produced under him and hands it over to the treasurers up on the Acropolis, and it is not permitted to go up to the

135. 43.5.
136. 44.2–3.

Areopagus before he has handed over all of it to the treasurers. During the rest of the time, the treasurers watch over it on the Acropolis, but at the Panathenaea they measure it out to the commissioners of games, and the commissioners of games to those of the competitors who win. There are prizes for those who win in the music contest, silver and gold objects, shields for those in manliness, and olive oil for those in the gymnastic contest and the horse race.

(Q) Military Officials (61)

61.1 They also elect all the officials for war, ten generals: previously, one from each tribe, now from everyone. And these they assign by voting: one over the hoplites, who commands the hoplites when they go out; one over the land, who guards it, and, if there is war in the land, he wages it; two in charge of Piraeus, one for Munichia and one for Acte, who take care of guarding the things in Piraeus; one in charge of the taxation group contributors to Athens' navy (*summoriai*), who registers those serving as patrons and commanders of a ship, conducts exchanges of property trials for them, and presents suits for them. The others they send out for current business. |61.2| There is a vote about them in each prytany, to see if they seem to be exercising their office well. And if they vote against anyone, they try him in court, and if he is convicted, they assess what he must suffer or pay, but if he is acquitted, he holds office again. When they are commanding, they have authority to fetter a disorderly man, to dismiss him and impose a fine; but they do not usually impose a fine. |61.3| They also elect ten regimental commanders, one from each tribe; he leads his tribesmen and appoints the company captains (*lochagoi*). |61.4| They also elect two cavalry commanders in chief, from everyone; these men lead the cavalry, choosing 5 tribes each; they have authority over the same things as the generals over the hoplites. There is also a vote in the case of these men. |61.5| They elect also 10 commanders of the tribal regiments of cavalry, one per tribe, to lead [the cavalry regiments] just as the regimental commanders do the hoplites. |61.6| They also elect a cavalry commander in chief for Lemnos, who takes care of the cavalry on Lemnos. They also elect a treasurer for the [sacred trireme named] Paralus and another[137] one for the Ammonos.

(R) Concluding Note on Officials (62)

62.1 Of the officials chosen by lot, some used to be chosen by lot with the nine archons from the whole tribe, while those chosen by lot in the Theseum were chosen on the basis of a distribution to the demes. But, since the demes were selling [the offices], these

137. Reading ἄλλον.

officials too were chosen by lot from the whole tribe, except the councilors and the guards; these they give to the demes. |62.2| Wages are paid, first, to the people, for the other assemblies, one drachma, for the assembly with full authority, nine obols. Then to the courts, three obols. Next, the council, five obols. To the prytanes for food, an obol is added. Then the nine archons take four obols each for food and in addition maintain a herald and a piper. Then the archon for Salamis, a drachma a day. The commissioners of games dine in the Prytaneum during the month of Hecatombaeon,[138] when the Panathenaea occurs, beginning from the fourth of the month. The officials with financial responsibility for the sanctuary at Delos take a drachma for each day from Delos. All the officials sent to Samos, Scyros, Lemnos, or Imbros receive silver for meals. |62.3| It is possible to hold the war offices more frequently, but none of the others, except to serve as councilor twice.

(S) Courts (63–69)

63.1 The 9 archons allot the courts, according to tribe, with the secretary of the thesmothetae [doing so] for the tenth tribe.[139] |63.2| There are ten entrances to the courts, one for each tribe, and twenty allotment machines (*klêrôtêria*), two for each tribe, and a hundred boxes, ten for each tribe, and other boxes, into which the tablets of the judges appointed by lot are thrown, and two water pots. And staves are set up beside each entrance, as many as there are jurors, and acorns are thrown into the water pot, equal in number to the staves, and letters are written on the acorns, starting from the eleventh letter *lambda*, as many as there are courts to be filled. |63.3| Serving as judges is permitted to all those who are over 30 years old and not indebted to the public treasury or deprived of their citizen status. If anyone serves as a judge who is not permitted to, he is liable to a denunciation to a public official and is presented in court. If he is convicted, the judges impose on him whatever he seems to deserve to suffer or pay. If he is assessed money, he must be imprisoned until he pays the previous debt for which he was denounced as well as the further penalty that the court imposed on him. |63.4| Each judge has his boxwood tablet, which is inscribed with his name, patronymic, and deme, and one of the letters of the alphabet up to *kappa*; for the judges have been distributed by tribes into ten parts, around the same number under each letter. |63.5| When the thesmothetae allots the letters that are to be attached to the courts, the attendant takes and affixes to each court the letter allotted to it.

64.1 The ten boxes are placed before the entrance for each tribe; the letters up to *kappa* are inscribed on them. When the judges have deposited their tablets into the box on which the same letter is inscribed as on his tablet, then, after the attendant has shaken

138. Mid-June–mid-July.
139. 59.7.

the boxes, the thesmothetae draws from each box one tablet. |64.2| This man is called the "inserter," and he inserts the tablets from his box into the column [on the allotment machine] to which the same letter is applied as on the box. He is chosen by lot, in order that the same man not, by always doing the inserting, do evil. There are five columns in each of the allotment machines. |64.3| When he has deposited the cubes [into the machine], the archon draws lots for the tribe in accord with the allotment machine. The cubes are bronze, black, and white. As many white cubes are deposited as there are judges to be appointed by lot, one cube for each five tablets; and the black ones in the same way. When the archon has taken out the cubes, the herald calls out those who have been allotted; the inserter is also included in their number. |64.4| The one who is called responds, draws an acorn from the water pot, holds it out with the letter uppermost, and shows it first to the archon in charge. The archon, when he has seen it, deposits the man's tablet in the box on which the same letter is inscribed as on his acorn, in order that he enter the one court he has been allotted to and not the one he wishes, and that those someone wishes not gather together in a court. |64.5| Placed beside the archon are as many boxes as there are courts to be filled, each box having the letter that was assigned by lot to each court.

65.1 The judge, having shown again his acorn, [this time] to the attendant, then goes inside the barrier. The attendant gives him a staff of the same color as the court with the same letter as on his acorn, so that it be necessary for him to enter the court to which he has been allotted. For if he enters another one, he is exposed by the color of his staff. |65.2| For on the lintel of the entrance to each of the courts a color has been painted. Taking his staff, the judge proceeds to the court with the same color as his staff, and having the same letter as on his acorn. When he has entered the court, he receives on behalf of the people a token from the man who was allotted this office. |65.3| Then, holding their acorn and their staff the judges sit down, having entered the court in this way. To those rejected in the lottery, the inserters give back their tokens. |65.4| The public attendants hand over the boxes from each tribe, one for each court, in which are the [tablets with] the names from the tribe in that particular court. They hand these over to those appointed by lot to give them back to the judges in each court, five in number, so that they can call the judges from these and give them their pay.

66.1 When all the courts are full, 2 allotment machines are placed in the first of the courts, and bronze cubes on which are painted the colors of the courts, and other cubes on which the names of the officials are written. Two of the thesmothetae appointed by lot deposit the cubes separately from each other: one deposits the colors into one allotment machine, the other deposits the names of the officials into the other. The official who is allotted first, it is announced by the herald, is to use the first court that is allotted, and the second the second, and so on for the remainder, so that no official knows in advance which of them he is to use, but each use the one that is allotted to him. |66.2| When the judges have entered and have been distributed into the particular

courts, the official in charge of each court draws one tablet from each box, in order that there be ten, one from each tribe, and he deposits these tablets in another empty box. And of these he allots the first 5 lots, one for the water clock and four others for the ballots, in order that no one can suborn either the man in charge of the water clock or the men in charge of the ballots, and that there be no fraudulence about this. |66.3| The five who have not been allotted receive from the presiding officials written instructions about[140] how they are to receive their pay, and where in the courtroom itself each of the tribes is to do so, when they have judged, so that by having each tribe separated, they can receive their pay in small groups, and not, by having many confined in the same place, trouble each other.

67.1 Having done this, they call in the suits: when they are trying private matters, they call in the private suits, 4 in number [per session], one of each sort of private suit prescribed by the law, and the opposing litigants swear to speak to the point; when public matters, public suits, and they judge only one case [per session]. |67.2| There are water clocks with outflow pipes, into which they pour the water against which one must speak in private suits. Ten choes[141] are granted for suits over five thousand drachmas, and three choes for the second speech; seven choes for those up to five thousand, and two choes [for the second speech]; five choes for those within 1,000, and two choes [for the second speech]; six choes for cases with rival claims and there is no [second] speech. |67.3| The man appointed by lot to the water clock stops the pipe whenever the secretary is about to read a decree, law, testimony, or contract. But when the private suit is measured on the basis of a day, he does not stop; it; instead, an equal amount of water is given to the prosecutor and the defendant. |67.4| It is measured on the basis of the days of Poseidon,[142] for they are also compatible with the others. They use 11 amphoras, which are distributed in fixed portions. The judge [in charge of the water clocks] sets aside three amphoras for the voting, and each party takes an equal share of the rest. For previously [the prosecutors] were eager to force the defendants into a very small share of the time, so they take the remaining water; but now there are two jars, one for the prosecutors, the other for the defendants. |67.5| In previous times he took out some water for the second vote. The day is divided for the public suits for which there is a penalty of imprisonment, death, exile, being deprived of citizen status, confiscation of property, or there has to be an assessment of what the culprit has to suffer or pay.

68.1 Among the law courts, the public ones consist of 501 judges, to which they give the judging of the lesser cases. When they need to present the greater public cases before 1,000, two courts are brought together into the Eliaia,[143] and for the greatest suits, 3 courts are united before 1,500. |68.2| The ballots are bronze, with a tube through

140. Reading τὸ πρόγραμμα. There is a hiatus in the papyrus.
141. One *chous* is roughly three or four minutes.
142. Mid-November–mid-December. The shortest month.
143. The largest court in Athens.

the middle, half hollow and half solid. When the speeches have been delivered, the judges appointed by lot for the ballots hand over two ballots to each of the judges, a hollow and a solid, out in the open for the opposing litigants to see, in order that the judges not receive two solid or two hollow ones. Then the man appointed by lot for this task takes away the staves, in exchange for which each judge receives a bronze token marked with gamma when he casts his vote (for on returning that he receives 3 obols), so that all shall vote; for it is not possible for anyone to take a token unless he does vote. |68.3| There are two amphoras standing in the court, a bronze one and a wooden one, so perforated that no one escape notice depositing ballots, and the judges cast their ballots into these: the bronze amphora is the authoritative one and the wooden is the one that is not authoritative, and the bronze one has a pierced attachment such that only one ballot can pass through it, so that the same man cannot deposit two ballots. |68.4| When the judges are about to vote, first, the herald asks whether the opposing litigants challenge the testimonies (for it is not possible to make a challenge when they have started to vote). Then he proclaims again, "The hollow ballot is for the man who spoke before, and the solid is for the man who spoke later." The judge takes his ballots from the lamp-stand, covering the tube of the ballot and not showing the hollow or the solid tube to the contestants, and deposits the authoritative ballot in the bronze amphora, and the non-authoritative one in the wooden.

69.1 When they have all voted, the attendants take the authoritative amphora and empty it onto a board with as many holes as there are ballots, in order that both the hollow ones and the solid ones may be laid out openly and easily counted. The men appointed by lot to take charge of the ballots count them on the board, the solid ones and the hollow ones separately, and the herald announces the number of the ballots, the hollow for the prosecutor and the solid for the defendant: whichever has the greater number wins, and if they are equal, the defendant does. |69.2| Then again they assess the damages, if an assessment is needed, voting in the same way, giving up their token and taking their staff again. Speeches on the assessment are made against a half allowance of the water clock for each. When they have completed the trials prescribed by the laws, they receive their pay in the place assigned to each by lot.

FRAGMENTS*

INTRODUCTION

It was widely agreed in antiquity that Aristotle was the author of a variety of works, besides the extant treatises, including dialogs, polemics, notes, poems, and letters. Our information about these works survives only in reports, quotations, and paraphrases in other ancient texts, as well as some fragmentary papyri. Only a very few of these contain Aristotle's own words. Though the judgment of their authenticity is a vexed and difficult question, there is strong evidence that the fragments included here by and large represent Aristotle's thought, at least at some stage in his career. Moreover, they both illuminate the works that have been preserved in their entirety and discuss issues that are otherwise unreported. The extensive critique of Platonic Forms in *On Forms* (F173–176), alluded to in the *Metaphysics* and preserved only by Alexander of Aphrodisias, is an example of the former, the dialog *On Justice* in four books (F120–125), which attempted to defend justice in a manner not unlike that of Plato's *Republic*, an example of the latter. Perhaps more tantalizing are the points at which the fragments appear to contradict attested views from elsewhere in the corpus. The clearest case of this is the *Eudemus* (F68–80), which seems to have proposed views about recollection and the immortality of the soul close in spirit to Plato's *Phaedo*.

1. Dialogs

TESTIMONIES ON THE DIALOGS

F1 *Cicero,* Letters to Atticus *4.16*

I use proems for individual books, as Aristotle did in the works he called "exoteric."

F2 *Basil,* Letter *135*

Even among the pagan philosophers who have composed dialogs, Aristotle and Theophrastus have dealt at once with the things at issue themselves, because they were conscious of their lack of Platonic grace. But Plato, by the power of his writing, at one and the same time both battles beliefs and incidentally ridicules the people.

F3 *Ammonius, On Aristotle's* Categories *6.29–7.4*

In the dialogs, which he wrote for ordinary people, [Aristotle] takes thought for a certain loftiness and abundance of style and metaphor, and he shapes the form of the style

* Translated and introduced by Justin Vlasits. Text: V. Rose, *Aristotelis qui ferebantur librorum fragmenta,* 3rd ed. (Leipzig, 1883), unless otherwise indicated. Fragments preceded by an asterisk are not in Rose; those in Rose are sometimes presented in less or more extended versions.

according to the personalities of the speakers, and simply whatever he knew would embellish the form of the language.

F4 *Themistius,* Orations *26.319c–d*

[Of Aristotle's works], those that are for public consumption and had been prepared for the majority of people are full of light and radiance, and their benefit is not at all unenjoyable or unpleasant, but Aphrodite pours herself out and the Graces bloom.

F5 *Elias, On Aristotle's* Categories *124.3–6*

In the dialogs . . . [Aristotle] produces variety with his imitations, full of Aphrodite and filled with the Graces.

F6 *Cicero,* Letters to Atticus *13.19*

The works I am writing in the present times follow the *Aristotelian* manner, in which the conversation of others is so represented as to leave him the main part.

F7 *Elias, On Aristotle's* Categories *115.3–5*

Alexander says that another difference between the lectures and the dialogs is that in the lectures [Aristotle] says what seems so to him and the truth, whereas in in the dialogs he says what seems so to others and is false.

F8 *Cicero,* On Ends *5.12*

Since there are two genres of [Peripatetic] books, one written for a popular audience, which is called *exôterikon* ["exoteric"], the other written for a limited audience, which are the ones they left behind in notes, they do not always seem to say the same thing [about the highest good].

F9 *Aristoxenus,* Elements of Harmony *30–31*

Just as Aristotle always used to relate, the majority of Plato's students attended the lecture on the good. Each was coming with the expectation that they would grasp something about those things that are considered to be human goods: wealth, health, strength, and, in general, some sort of wondrous happiness. But when the arguments were found to be about sciences, numbers, geometry, astronomy, and, in short, that the good is one, I think it appeared completely unacceptable to them. Thus, some came to despise the thing, while others found fault with it.

1.1 *ON PHILOSOPHY*

F10 *Priscian of Lydia,* Answers to King Chosroes of Persia *14.41–42 (Bywater)*

For it is from Plato's *Timaeus* . . . received and completed by Aristotle's works *Physics*, *De Caelo, On Coming to Be and Passing Away*, and *Meteorology*, and similarly from

those works *On Sleep and Dreams* and those that are written as though as dialogs *On Philosophy* and *On Worlds.*

F11 **Philodemus,* On Piety *PHerc 1077 col. 38, 1089–1099 (pp. 180–181 Obbink)*[1]

Polyaenus, in the first book of *Against Aristotle's On Philosophy*, declares that the divine nature is the cause of good things for us.

F12 **Asclepius, On Aristotle's* Metaphysics *112.16–19 (993ª22)*

Indeed, [Aristotle] says, we have also spoken about these starting-points[2] in the *Physics*. Then he promised to speak about them in *Metaphysics 2* and discuss and solve puzzles about them in *On Philosophy*.

F13 *R1 Plutarch,* Against Colotes *1118C7–11*

The most divine of the inscriptions in Delphi was apparently "know thyself," which gave Socrates the start to his puzzlement and investigation, as Aristotle says in his Platonic works.

F14 *R2 Diogenes Laertius 2.23*

Aristotle says that Socrates went to the Pythia, but also to the Isthmus [of Corinth], as Favorinus says in the first book of the *Recollections*.

F15 *R3A John Stobaeus 3.21.26.1–16 (Hense)*

Porphyry from Book 1 of *On Know Thyself*: What precisely, and from whom, was the sacred command in the Pythia, which bids those who will beg anything from the god[3] to know thyself? . . . Or else it was Phemonoe . . . or Phanothea . . . or else it was set up by Bias, Thales, or Chilon, moved by some divine inspiration, as a votive offering. Or one must instead pay heed to Clearchus, who declares it to be an instruction of the Pythia, and to have proclaimed to Chilon, who heard it, to learn the most important thing for human beings. Or it was recorded even before Chilon in the temple that was established after the one made of feathers and the other made of bronze, just as Aristotle said in the works *On Philosophy*.

F16 *R3B Clement of Alexandria,* Stromata *1.14.60.3*

Some suppose that the phrase "know thyself" is by Chilon; Chamaeleon, in *On Gods*, supposes that it is by Thales, and Aristotle that it is by the Pythia.

1. Text: D. Obbink (ed.), *Philodemus On Piety* (Oxford, 1997).
2. I.e., matter and form.
3. Apollo.

F17 *R4 Clement of Alexandria,* Stromata *1.14.61.1–2*

And, again, they attribute the "nothing in excess" to Chilon the Spartan. . . . But those around Aristotle considered ["Make a pledge and you are ruined"] to have been made by Chilon, and Didymus says that the exhortation is by Thales.

F18 *R5* Etymologicum Magnum *722*

"Sophist": most properly someone being sophistical. But Aristotle calls the Seven Sages "sophists."

F19 *R6 Diogenes Laertius 1.8*

Aristotle, in the first book of *On Philosophy*, also says that [the Magi] are older than the Egyptians. And according to them there are two starting-points: a good daimon and a bad daimon, and the name for the former is Zeus or Oromasdes [= Ahura Mazda] and for the latter Hades or Areimanius [= Angra Mainyu].

F20 *R7A John Philoponus, On Aristotle's* De Anima *186.23–25 (410^{b}27)*

Aristotle says "so-called" since he believes that the poems are not by Orpheus, as he also says in the works *On Philosophy*. For the doctrines are from Orpheus, but he says that Onomacritus stretched them out into verses.

F21 *R7B Cicero,* On the Nature of the Gods *1.107*

Aristotle teaches that there never was a poet Orpheus and the Pythagoreans attribute this Orphic poem to a certain Cercops.

F22 **Sextus Empiricus,* Against the Physicists *2.45–46*

Some say that there is movement, others that there is not. . . . The associates of Parmenides and Melissus say that there is not. Aristotle called them "immobilizers (*stasiôtai*)" of nature and "non-naturalists": "immobilizers" from immobility (*stasis*), "non-naturalists" because nature is the starting-point of movement, which they annul when they say that nothing moves.

F23 *R8A Proclus, Quoted in John Philoponus,* Against Aristotle on the Eternity of the World *31.17–32.8*

[Aristotle] probably rejected none of Plato's views so much as the hypothesis of Forms. Not only in the logical works . . . , but also in the ethical, . . . the natural scientific, . . . and much more in the metaphysical . . . ones. . . . And in the dialogs he cries out so perspicuously that it is impossible to be sympathetic to this doctrine, even if someone were to think that he is objecting out of a love of contention.

F24 *R8B Plutarch,* Against Colotes *1115B8–C4*

Aristotle called Plato out about the Forms, moving against him everywhere and bringing every puzzle against them in the ethical treatises and the natural scientific ones.[4] But in the exoteric dialogs Aristotle seemed to some to be more contentious than philosophical toward this doctrine, as if he put forward Plato's philosophy in order to despise it. In this way, he was far from following [Plato].

F25 *R9 Syrianus, On Aristotle's* Metaphysics *159.33–160.5 (1086^{a}18–21)*

The fact that [Aristotle] himself agrees that he has said nothing against [the Platonists'] hypotheses, nor does he at all attend closely to Form numbers,[5] if indeed they were to be taken as distinct from mathematical numbers, is witnessed in the following way by the second book of *On Philosophy*: "Thus if the Forms are another sort of number, not the mathematical one, we would not have any understanding of it. For who, at least of the majority of us, understands another sort of number?" So here too he refutes ordinary people who are ignorant of any sort of number other than the monadic number and did not even start to touch upon the thought of the divine men.[6]

F26 **Alexander of Aphrodisias, On Aristotle's* Metaphysics *117.23–118.1 (992^{a}10) (Golitsis)*

The doctrines of [the Platonists] are set forth, which he has also stated in *On Philosophy*. For those who wish to reduce the beings (for he always says the beings are substances), to the starting-points they hypothesize (for them the starting-points of the beings are the great and the small, which they call the "indefinite dyad"), these people, wishing to reduce everything to this, saying that the starting-points of length are the long and the short, since the coming to be of what has length is from something long and short, which are [respectively] great and small, or since every line is in one of these [great and small], while the starting-points of the plane are the wide and narrow, which are themselves great and small [respectively].

F27 **Pseudo Alexander of Aphrodisias (Michael of Ephesus), On Aristotle's* Metaphysics *777.11–21 (1087^{b})*

He [Aristotle] says that, also wishing to introduce magnitudes from the two starting-points (the one and the indefinite dyad), they say that from the two the line takes on the long and short, the plane takes on the wide and narrow, and the solid takes on the deep and shallow. For they call the long and short and the rest "Forms of the great and small in the indefinite dyad," and they all introduce the starting-point in accord with the one, but not in the same way. Some say these same numbers confer the forms on magnitudes, for example, two on line, three on plane, four on solid (for he recounts

4. Rejecting the addition of μετὰ τὰ φυσικά, ἐν τοῖς.
5. E.g., *NE* 1.6, *Met.* 1.6, 1.9.
6. Plato and his followers.

these things about Plato in *On Philosophy*, which is also why he has set out the thought about them here so briefly and summarily), but some completed the Form of the magnitudes by participation in the one.

F28 **Papyrus Aï Khanoum III B 77, P.O. 154 (Auffret)*[7]

Col. II
". . . For don't we say that not only do perceptibles commune with the Forms, but also that the Forms themselves commune with each other?"
"We do," he said.
"Then is it the cause of the fact that the Forms participate in none of the other beings the same as that of the fact that the other things participate in them? . . ."
Col. III
"So due to these same causes is it not necessary that the cause of participation is immovable? For each of the Forms is unchangeable for these reasons and because both the coming to be and passing away of the perceptibles is eternal?"
"Necessarily," he said.
"Nonetheless, this would seem to be the most controlling and primary of the causes?"
"Correct."
"For this is the cause of participation [in the Forms] for all things and for all the Forms in each other. . . ."
Col. IV
". . . [it] would be clearly as bad as possible, if in its position it were to be something that has come to be and were perceptible. Do you understand, at least approximately?"
"Very much so," he said.
"But if it does not participate in any of the Forms, it will be primary. But were it not to participate in the other Forms, it would not be a Form."
"So it seems," he said.

F29 *R10 Sextus Empiricus,* Against the Physicists *1.20–22*

Aristotle said that the notion of the gods came to be among human beings from two starting-points: from occurrences in the soul and from things in the heavens. From the occurrences in the soul because of soul's inspiration during sleep and its prophecies. For whenever, he says, the soul is by itself in sleep, then, having regained its special nature, it prophesizes and foretells the future things. The soul is also this way when it is separated from the bodies at death. He accepts, at any rate, that the poet Homer also observed this. For he made Patroclus, while he was dying, foretell the death of Hector, and Hector [while he was dying] foretell the end of Achilles. From these things, he said, humans surmised that something divine exists, which is intrinsically like the soul and most knowledgeable about all things. And also from the things in the heavens; for

7. T. Auffret, "Un 'nouveau' fragment du Περὶ φιλοσοφίας: le papyrus d'Aï Khanoum," *Elenchos: Rivista di Studi sul Pensiero Antico* (2019): 25–66.

having observed the sun going around during the day, and at night the well-ordered movement of the other stars, they thought that some god existed, which is the cause of such movement and good order. Aristotle is this sort of person.

F30 *R11 Sextus Empiricus,* Against the Physicists *1.26–27*

Some, having recourse to the unalterable and well-ordered movement of the heavens, say that from this movement we first began to have notions of the gods. For just as if someone sitting on Mount Ida in Troy saw the campaign of the Greeks with great order and arrangement advancing on the plains, "cavalry first with horses and chariots, infantry in the rear,"[8] such a person would completely come to the notion that there is someone making this arrangement and ordering those soldiers under his command, such as Nestor or one of the other heroes, who knew how "to put in order the horses and the shield-bearing men."[9] And in the same way someone experienced in sailing, at the same time as he sees a ship far away driven by a fair wind and well set out with all its sails, would understand that there is someone directing it and landing it at the appointed harbors. In this way, those who first looked up at the sky, contemplating the sun running its course from east to west and the sort of well-ordered dance of the stars, sought out the craftsman of this most beautiful design, guessing that it did not happen spontaneously, but rather by some greater and imperishable nature, which was a god.

F31 *R12A Cicero,* On the Nature of the Gods *2.95 (Plasberg)*

Aristotle said brilliantly that if there were people who had always lived under the earth in good and respectable homes, which were decorated with images and pictures and furnished with everything that those who are thought happy held in abundance, but had never been above ground, and they receive by word of mouth a report that there is some sort of divine will and power, then at another time, when a crevice is opened in the earth, they go out from their hidden dwellings into those places which we inhabit and are able to live, when they suddenly see earth, sea, and sky, know the size of the clouds and the power of the winds, and behold the sun and know both its size and beauty as well as its power, as it produces the day by spreading the entire sky with its light, and when night darkens the earth, they discern the whole sky ornately distributed with stars and the varying light of the moon as it waxes and wanes and the risings and fallings of them all and the courses calculated and immutable for all eternity—when they see these things, they would certainly judge there to be gods and that these are all works of gods. And this is what [Aristotle] said.

8. Homer, *Iliad* 4.297–298.
9. Homer, *Iliad* 2.554.

F32 *R12B Philo of Alexandria,* Allegorical Interpretation *3.97–99 (Cohn and Reiter)*

The first [philosophers] inquired about how we got the notion of the gods. Then those with the reputation of doing philosophy in an excellent way said that it is from the cosmos, its parts, and their capacities, that we were made to grasp the cause. For just as if one saw a house carefully crafted with entrances and porticoes, men's and women's quarters, and other parts of a house, one would acquire the notion of a craftsman, for one will not think that the house was completed without craft and a craftsman. And in the same way also for a city and a ship and everything constructed, great or small. Then in this way too, if someone enters into this cosmos (as if it were the greatest house or city), contemplating the heavens moving around in a circle and all things gathered together within it, planets and fixed stars moving in the same way elegantly and in tune and beneficially to all, and earth obtaining the most central place, streams of water and air set in the limit between them, and further the mortal and also immortal animals, various fruits and crops, one will reckon that these had not been produced without complete craft, and thus the craftsman of this universe was and is the god. Those reasoning in this way apprehend the god through [its] shadow, conceiving of the craftsman through his works.

F33 *R13 Synesius,* Praise of Baldness *22.1*

. . . if indeed the proverb too is a wise thing. But how could it not be a wise thing, [since it concerns] those things about which Aristotle says[10] that they are traces of an ancient philosophy, lost through the greatest destructions of humanity, which were preserved on account of their concision and pith.

F34 **John Philoponus,* On Nicomachus' Introduction to Arithmetic *1.1*

Now "wisdom (*sophia*)" is so called as though it were "some sort of perspicuousness (*sapheia tis ousa*)," since it [wisdom] makes all things perspicuous. And this, "the perspicuous (*to saphes*)," is so called as though it were "some shining being (*phaes ti on*)," derived from "luminosity and light (*phaos kai phôs*)," on account of leading hidden things into light.

F35 *R14 Seneca,* Natural Questions *7.30.1*

Aristotle admirably said that we should never be more modest than when the subject turns to the gods. If we only enter temples with composure, if when we approach the sacrifice we bow our head, we carry our toga, if we put on every sign of modesty, how much more should we do so when we dispute about the stars, about the planets, and about the nature of the gods, lest we impudently believe something rashly in ignorance or knowingly lie about something.

10. *Met.* 1074^{a}38–^{b}14.

F36 *R15 Synesius,* Dion *8.6*

As Aristotle claims, those who are being initiated [into mysteries] do not have to learn why something must be so, but be affected by something and be in a certain disposition, obviously, if they have [already] come to be deserving.

F37 **Michael Psellus,* Theologica *30.2, 7–17*

I offered to teach you what I have learned, not what I have been affected by . . . for all writing is divided into these two sorts . . . : the teachable and what is connected with the initiation into mysteries. The former comes to human beings first by hearing, but the latter when the understanding itself is affected by illumination. This is what Aristotle called "mystical" and likened to the Eleusinian mysteries, since in these the initiate was stamped with visions, but not taught. Now, whoever was shown the immortality of the soul through self-movement, this person received learning through teaching, not through initiation. But if someone, seeing it as an eyewitness with his understanding, saw the soul itself (rather than one who is not contemplating the soul directly with his understanding but is shown its immortality), this person was affected [by it] and initiated.

F38 *R16 Simplicius, On Aristotle's* De Caelo *288.28–289.15 (279ª18)*

[Aristotle] says that the fact that the divine is eternal is witnessed by the things brought to light by the arguments put forth in many places in the philosophical works in circulation, namely, that everything divine, being the first and highest of things, is necessarily unchangeable. For if it is unchangeable, it is also eternal. He calls "philosophical works in circulation" those works that, being first according to their arrangement, are addressed to the ordinary people (which we are accustomed to also call "exoteric"), since the esoteric works and treatises are weightier. He speaks about this in *On Philosophy*: for universally the things in which there is something better are the same things in which there is also something best. Since, then, among the beings, one is better than another, there is also, therefore, something that is best, which would be the divine. So if what changes changes either due to another or due to itself and, if due to another, either by something better or something worse and, if it by itself, either by changing toward something worse [than itself] or by seeking something nobler. But neither is there anything greater than the divine by which it will be changed (for then this would be more divine), nor is it right for the greater to be affected by the worse. But even if it were changed by the worse, something base would be added, but there is nothing base in it. Neither does it change itself by seeking something nobler, for it is not in need of its noble things. Nor does it change toward the worse, when not even a human being would willingly make themselves worse, nor does it have any base thing which it would add from the change toward the worse. Aristotle has received this demonstration from the second book of Plato's *Republic*.[11]

11. 380d–381e.

F39 *R17 Scholia on the* Proverbs of Solomon, *Cod. Paris Gr. 174 fol 45v–46f*

From Aristotle: the starting-point is one or many. If it is one, we have what was sought. If many, they are either ordered or unordered. But if they are unordered, what comes from them would be even more unordered and the cosmos would not be a cosmos but an anti-cosmos, and so what is contrary to nature will exist, while what is in accord with nature will not exist. And if they are ordered, either they are ordered from themselves or by some external cause. But if they are ordered by themselves, they have something in common which is what connects them, and this is the starting-point.

F40 *R18 Philo of Alexandria,* On the Eternity of the World *10–11 (Cohn and Reiter)*

Aristotle, objecting [to these views] out of piety and devotion, said that the cosmos cannot come to be or pass away,[12] and condemned the clever ungodliness of those who expound the contrary view, and who suppose that such a visible god, which truly contains the sun, moon, and the rest of the pantheon of the planets and stars, does not differ at all from the works of manual labor. And one can almost hear him railing against them when he says that in the past he feared that his house might be overturned by violent winds, extraordinary storms, time, or neglecting maintenance, but now a greater fear was suspended, a fear of those who destroy the whole cosmos with [their] argument.

F41 *R19 Philo of Alexandria,* On the Eternity of the World *20–24 (Cohn and Reiter)*

The arguments establishing that the cosmos cannot come to be or pass away must, out of reverence toward the visible god, be the first to be arranged and to involve the proper starting-point. For of all things admitting of passing away there are two causes of destruction, one internal, the other external. In any event you could find iron, bronze, and substances of this sort disappearing by themselves whenever rust eats through them as it courses over them in the manner of a shingles-like illness, and from external causes as when a house or a city are set on fire together and are destroyed by the forceful rush of fire. Animals also meet their end in the same sorts of ways, either of themselves from illness or by external things—for example, by having their throat cut, being stoned, being burned, or suffering an impure death by hanging. But if the cosmos too is to pass away, it will be destroyed by either an external capacity or with respect to some capacity within itself. But each of these is impossible. For there is nothing external to the cosmos, since everything is collected to fill it up. For in this way it will be one, whole, and ageless: one, because, had some things been left behind, there would be a distinct cosmos similar to the present one; whole, because all substance together is exhausted in it; and ageless and free from sickness, since bodies that can be conquered by illness and old age are strongly upset by hot and cold and the other external contraries that

12. *Cael.* 1.10.

additionally befall them, and no capacity of these can escape to encircle and attack it, since all of them, no part excepted, have been entirely caught inside. But if then it is something external, it would be entirely void, an impassive nature, which is unable to be affected by anything or do anything. And nor will it be dissolved by some cause internal to it. First, since the part will be greater and mightier than the whole, which is completely absurd. For the cosmos, using unsurpassable might, leads all its parts and is led by none of them. Further, since there are two causes of passing away (internal and external), what can submit to the one is also in every case receptive of the other. A sign of this: cow, horse, human, and similar animals, because they can be destroyed by iron, will also die by illness. For it is more difficult, nay impossible, to find something that, although it can naturally submit to the external cause of passing away, will not be able to admit at all of the internal one. Therefore, since the cosmos was proved not to pass away either by anything external (due to the fact that nothing external to it remains at all) or by anything within it (because of the demonstration stated before, in accord with which what is conquered by one of the causes was also naturally able to admit of the other). . . .[13]

F42 *R20 Philo of Alexandria,* On the Eternity of the World *28–34 (Cohn and Reiter)*

It is also proved in this sort of way: everything among the composites that passes away has its dissolution into the things from which it was composed. Therefore, dissolution is nothing other than the return of each thing to its natural state, so that contrarywise composition would force things to come together contrary to their nature. But now this seems indeed to be completely false. For we humans were blended together from the four elements, earth, water, air, and fire (which wholly constitute the entirety of the heavens), by borrowing small parts [of them]. But when these parts were blended, they were deprived of their natural position: heat, which is upward-moving, is forced down, earthen and heavy substance is lightened and gets instead the upper place, which the most earthen part of us—the head—has occupied. The worst of the bonds, though, is that which force fastens, which being forced is short-lived; for it is broken more quickly by the things that are bound, inasmuch as they shake it off because of longing for their natural movement, toward which they hasten to migrate. For, according to the tragedian,[14] "What has grown from earth goes back to earth, what springs from airy parents returns to the celestial sphere. Nothing that comes to be dies; while one is disaggregated in one direction, another in another, each shows forth its own shape." This law and ordinance has been inscribed for all things that pass away. Whenever the parts that have come together in the blend have settled down, in place of their natural order they have accepted disorder, and migrate to the contrary places, so they seem in a way to live in exile. But whenever they are dissolved, they return to their own naturally assigned

13. Incomplete in the source text.
14. Euripides, Fr. 836 Nauck.

place. But the cosmos is free from the disorder present in the things just mentioned. For let us consider it well. If the cosmos is passing away, its parts at this moment have necessarily been ordered in a place contrary to nature. But it is not lawful to suppose this [of the cosmos]; for all the parts of the cosmos have obtained the best position and harmonious order, since each thing, as if fond of its own fatherland, does not seek out a change for the better. Because of this, the most central place is assigned to earth, to which all earthen things, even if you throw them up, are brought down. This is a sign of a place that is in accord with nature; for that place where something stands and rests, when brought there without force, is its own allotted space. And water has been poured over the earth, and air and fire have been spread from the middle toward the upper place, air being allotted the place bordering water and fire, and fire the highest place. That is why, even if you light a torch and let it fall toward the earth, the flame will nonetheless use force against it, and with the natural movement of fire lifting itself up, rise upward. If, then, the cause of passing away for all other animals is unnatural [place], and in the cosmos each of the parts is ordered by nature, having been allotted its proper place, the universe would be rightly called "incapable of passing away."

F43 *R21 Philo of Alexandria,* On the Eternity of the World *39–43 (Cohn and Reiter)*

The most demonstrative argument, at any rate, is that which I know thousands are proud of, as if it were investigated with exactness and completely irrefutable. For they ask: for what purpose would God destroy the cosmos? It would either be for the sake of no longer engaging in world-making or else for the sake of constructing another one. But the former is foreign to God; for he should change disorder to order, not order to disorder. Then, because God would admit of a change of mind, he would admit of an affection and illness of the soul. For he should either not have made the cosmos at all, or else, judging the work to befit him, rejoice in what has come to be. But the latter is worthy of a non-too-brief inquiry. For if he had constructed another cosmos in place of the present one, the cosmos that would have come to be would, on the whole, have been made worse, similar, or better. Each of these options can be attacked. For if the cosmos were worse, the craftsman too would be worse. But God's works are faultless, uncriticizable, and incorrigible, since they have been created with complete craft and scientific knowledge. "For not even a woman," as they say, "lacks good sense to such an extent that she would choose the worse over the better when present." But it is fitting for the god to give shape to the shapeless and to confer wondrous beauty on the ugliest things. On the other hand, if [the other cosmos] were similar, the craftsman would labor in vain and not differ at all from little children, who often when playing on the beach build mounds of sand, then seize them from below with their hands, and tear them down again.[15] For much better than constructing something similar would be neither to remove nor add anything, nor again change

15. Cf. Homer, *Iliad* 15.360–364.

anything for better or worse, but to leave the cosmos that once came to be at the start in its place. But if he is to craft something better, the craftsman will also become better, so that when he constructed the first cosmos, he was less complete in craft and thought—which is precisely the thing it is not lawful even to suppose. For the god is always equal and similar to himself and admits neither of relaxing toward the worse nor of tightening toward the better.

F44 *R22 Cicero,* Lucullus *38.119 (Plasberg)*

For when your Stoic sage has spelled out these things for you, Aristotle will come, pouring forth a golden river of speech, and would say that the man lacks understanding, since the world never came to be, because there was no beginning, with a newly begun plan, of such a brilliant work and since it is joined everywhere in such a way that no force could bring about such great movements and changes, no old age can come about due to the passage of time, so that this ordered world should ever fall to pieces.

F45 **Lactantius,* The Divine Institutes *2.10.24–25*

If it is possible for [the world] to perish entirely, since it passes away partially, it seems to come to be at some time, and fragility is manifest at the beginning as well as the end. If these things are true, Aristotle could not defend the claim that the world itself has no beginning.

F46 *R23 Cicero,* On the Nature of the Gods *2.15 (Plasberg)*

Since the place of some animate things is on the earth, while of others it is in water or the air, it seems absurd to Aristotle to think that no animal comes to be in that region which is most suitable for animate things to come to be. But heavenly bodies occupy the place of ether. Since this is the finest [substance], always in motion and full of life, it is necessary that some sort of animal comes to be in it that possesses penetrating perception and quick movement. That is why, when stars come to be in ether, it is proper for there to be perception and intelligence in them. From this fact, one is led to believe that the stars must be counted among the gods.

F47 *R24 Cicero,* On the Nature of the Gods *2.16 (Plasberg)*

And indeed Aristotle is to be praised in that he holds that all things that are moved are moved either by nature, force, or voluntarily. But the sun, the moon, and all the stars are moved. However, what is moved by nature is either brought downward by heaviness or elevated by lightness, neither of which befalls the stars, because their movement carries them in a circular orbit. Nor indeed can he say that the movement is generated by some greater force so that the stars are moved contrary to nature. For what force could be greater? It remains that the movement of the stars is voluntary. He who sees these things would not only be ignorant but also impious if he denied that the gods existed.

F48 **Nemesius,* On the Nature of Man *5.52.21-23 (Morani)*

Aristotle also introduced a fifth body, the circular-moving ether, since he did not want the heavens to have come to be out of the four elements. He says that the fifth body is moved circularly because it moves around itself in a circle.

F49 **Aëtius 5.20.1 (Mansfeld and Runia)*

Plato and Aristotle say there are four kinds of animals: terrestrial, aquatic, winged, and celestial, since the stars are said to be animals, as are the cosmos and God—an immortal rational animal.

F50 *R25A Censorinus,* On the Birthday *18.11*

Furthermore, there is the year that Aristotle called "greatest" rather than "great," which the orbits of the sun, moon, and five wandering stars produce when they return to the same constellation, where they once were together.

F51 *R25B Cicero,* On the Nature of the Gods *2.20 (Plasberg)*

In truth the movements of those five stars, which are falsely called "wandering," are the most admirable. . . . It is from their unequal movements that the mathematicians called the "great year" what happens when a revolution of the sun, moon, and five wandering stars is made at the same relative special location among them. It is a difficult question exactly how long it is, but it is necessarily a fixed and definite length.

F52 *R26B Cicero,* On the Nature of the Gods *1.33 (Plasberg)*

Aristotle in the third book of *On Philosophy* creates much confusion when he disagrees with his master Plato. For sometimes he assigns all divinity to mind, sometimes he says that the world itself is a god, sometimes he sets another god over the world and assigns to it the functions to govern and preserve the world's movement by a certain "winding." Then he says that the heat of the heavens is a god, without understanding that the heavens is a part of the world, which he himself in another place says is a god. But in what way can that divine perception of the heavens be preserved while it moves so quickly? Where, then, are all these gods, if we also count the heavens among the gods? But when he wants to say that the same god is without body, he strips it of all sense perception as well as practical wisdom. Moreover, in what way can it be moved while it lacked a body, and in what way can it be at rest and blessed if it is always moving itself?

1.2 *ON THE GOOD*

F53 *Simplicius, On Aristotle's* De Anima *28.6–9 (404^{b}18)*

Concerning philosophy, he now states the things recorded by him from Plato's conversations, in which he recounts the beliefs of the Pythagoreans and Platonists about the beings.

F54 *John Philoponus, On Aristotle's* De Anima *75.34–76.1 (404^{b}18)*

The work entitled *On the Good* speaks about philosophy. In it, Aristotle recounts Plato's unwritten conversations. The book is genuinely by him. He recounts there the belief of Plato and the Pythagoreans about the beings and their starting-points.

F55 *R27 Vita Aristotelis Marciana 146–151 (Gigon)*

Aristotle came indeed to have a very moderate character, since in the *Categories* he said that one should not give one's opinion rashly but review the issue many times, and that even to be merely puzzling through issues is not useless. And in *On the Good*, he says, "One should remember that one is a human, not only when lucky but also when demonstrating."

F56 *R28A Alexander of Aphrodisias, On Aristotle's* Metaphysics *56.33–35 (987^{b}33) (Golitsis)*

And for some such reasons Plato posited the one and the dyad as starting-points for the numbers and all the beings, as Aristotle says in *On the Good*.

F57 *R28B Alexander of Aphrodisias, On Aristotle's* Metaphysics *85.16–18 (990^{b}15) (Golitsis)*

The starting-points are the one and the indefinite dyad, as he has said a little while ago and he also recounted in the works *On the Good.*

F58 *R28C Simplicius, On Aristotle's* Physics *151.6–11 (187^{a}12–21)*

Alexander says that according to Plato the starting-points of all things and of the Forms themselves are the one and the indefinite dyad, which he calls the "great and small," as Aristotle also mentions in *On the Good*. One might also take this from Speusippus, Xenocrates, or others, who attended Plato's lecture on the good. For they all wrote down and preserved his opinion and they say that he used these starting-points.

F59 *R28D Simplicius, On Aristotle's* Physics *453.24–455.14 (202^{b}36)*

[Aristotle] says that the unlimited is in both the perceptibles and the Forms. For they say that, according to Plato, the one and the indefinite dyad are also starting-points of the perceptibles. Setting the indefinite dyad down also among the intelligible things, he said it was unlimited, and setting down the great and the small as starting-point, he said

it was unlimited in *On the Good*, at which Aristotle, Heraclides, Hestiaeus, and other companions of Plato were in attendance and wrote up what was said enigmatically, as it was said. . . . And Alexander himself, agreeing to speak on the basis of Plato's lectures *On the Good*, the lectures that Aristotle and Plato's other companions recounted, wrote the following: "For Plato, when inquiring into the starting-points of the beings, since it seemed to him that number was prior in nature to the others (for the limits of the line are points, and points are units with position, and there are neither planes nor solids without lines, but number can be even without them), therefore, since number is prior in nature to the others, he thought this was the starting-point and that the starting-points of the first number are also the starting-points of number as a whole. Two is the first number, whose starting-points he said are the one and the great and the small. For, insofar as it is two, it has plurality and fewness in itself. Insofar as the double is in it, plurality is in it (for the double is a plurality and excess and a sort of magnitude), but insofar as it is half, fewness. That is why excess and deficiency and great and small are in it in these ways. And insofar as each of its parts is a unit and it is some one form, the dyadic, it participates in the unit. That is why he said that the one and the great and small are the starting-points of two. And he said that this is the indefinite dyad, by having the more and the less, since it participates in the great and small or the greater and smaller. For, since these proceed in accord with tightening and loosening, they do not come to a stop, but go on toward the indefiniteness of the unlimited. Since, then, two is the first of the numbers, and its starting-points are the one and the great and small, these are necessarily also the starting-points of all numbers. And the numbers are the elements of all beings. Thus the starting-points of everything are the one and the great and small (that is, the indefinite dyad). For, each of the numbers, insofar as it is some this, and one, and definite, participates in the one, but insofar as it is divided and is a plurality, it participates in the indefinite dyad. Plato also says that the Forms are numbers, so he reasonably made the starting-points of numbers the starting-points of the Forms too. He said two is the nature of the unlimited, because neither the great and small nor the greater and smaller are defined, but contain the more and less, which proceed without limit." In this way, Aristotle saying into what things the Pythagoreans put the unlimited and into what things Plato put the unlimited, recounted next what the Pythagoreans said the unlimited was and why.

F60 *R29A Sextus Empiricus,* Against the Mathematicians *3.57*

At any rate, Aristotle . . . claims that what is said by [the geometers] to be "a length without breadth" is not unintelligible, but that we can conceive it without any difficulty. He supports his argument with a very clear and perspicuous example. At any rate, we grasp the length of a wall, he says, without also taking into account its breadth, which is precisely why it is also possible to conceive of what is called "length" by the geometers without any breadth.

F61 *R30 Alexander of Aphrodisias, On Aristotle's* Metaphysics *59.28–60.2 (988[a]11) (Golitsis)*

Although Plato speaks of the efficient cause where he says "it is our task, then, to discover and display the maker and father of the universe,"[16] and also the for-the-sake-of-which and the end by what he again says, "all things are in relation to the king of all things and all things are for his sake,"[17] one might ask why Aristotle does not mention either of these causes as being part of Plato's view. Either [it is] because in the places in which [Plato] spoke about causes, he mentioned neither of them (as [Aristotle] has shown in *On the Good*), or else because he did not posit them as causes of things that come to be and pass away, and did not even work out anything about them.

F62 *R31 Alexander of Aphrodisias, On Aristotle's* Metaphysics *250.17–20 (1003[b]31–33) (Golitsis)*

As regards the knowledge that pretty much all the contraries are reduced to the one and the many as to a starting-point, he refers us to the *Selection of Contraries*, since he treats these issues especially there. He also spoke about such a selection in the second book of *On the Good*.

1.3 *MAGICUS*

F63 *R32 Diogenes Laertius 2.45*

Aristotle says that a certain Magus who came from Syria to Athens made several judgments about Socrates, notably that his end would be violent.

F64 *R33 Suda, s.v. Antisthenes*

[Antisthenes:] An Athenian . . . he wrote ten volumes, the first one, *Magicus*. He relates things about Zoroaster, a certain Magus who discovered wisdom. Some attribute this to Aristotle, others to some Rhodian.

F65 *R35 Diogenes Laertius 1.1*

Some say that the work of philosophy started from the barbarians. For the Magi have come to be among the Persians, the Chaldeans among the Babylonians and Assyrians, the naked sophists among the Indians, and those called "druids" and "holy men" among the Celts and Gauls, as Aristotle says in the *Magicus*, Sotion in the twenty-third book of *Successions* [of Philosophical Schools], and also Ochos was a Phoenician, Zamolxis was Thracian, and Atlas was Libyan.

16. *Timaeus* 28c.
17. †*Letter* 2, 312e.

F66 *R36 Diogenes Laertius 1.8*

The Magi . . . do not know "magian" wizardry, Aristotle says in the *Magicus* and Deinon in the fifth of his *Histories*, who also says "Zoroaster" is translated "star-worshipper." Hermodoros also says this.

1.4 *EUDEMUS* OR *ON THE SOUL*

F67 *R37A Cicero,* On Divination *1.25.53*

What? Is Aristotle, a man of singular, almost divine genius, in error himself or does he wish others to err, when he writes the following? When Eudemus, his Cyprian friend, was making a journey to Macedonia he arrived at Pherae, which was at that time a very famous city in Thessaly, but was controlled by the tyrant Alexander as a merciless master. And then in that place, Eudemus became very seriously ill, so that all the doctors despaired. A young man with excellent visage appeared [in a dream] to him while he was resting to say that he would recover very soon, that in a few days the tyrant Alexander would perish, and that he, Eudemus, would return home five years later. Aristotle writes that indeed the first [two] immediately ensued: Eudemus recovered and the tyrant was killed by his wife's brothers. But when the fifth year was ending, although he had hoped on the basis of that dream to return to Cyprus from Sicily, he was killed while fighting at Syracuse. So the dream was interpreted as meaning that, since Eudemus' soul departed from his body, it was seen to return home.

F68 *R38 Themistius, On Aristotle's* De Anima *106.29–107.4 (430ª25)*

But pretty much the majority and weightiest of the arguments, which [Plato in the *Phaedo*] propounded about the immortality of the soul, perhaps referred to the understanding, . . . just like the arguments elaborated by Aristotle himself in the *Eudemus*.

F69 *R39 Elias, On Aristotle's* Categories *114.25–115.12*

When establishing the immortality of the soul, [Aristotle] establishes it in the acroamatic lectures through compelling arguments, but in the dialogs through plausible likelihoods. . . . In the dialogs he says in this way that the soul is immortal, because all of us humans spontaneously pour libations to the departed and swear oaths on them, but no one would ever either pour a libation to a non-existent thing or swear by it. . . . It is in the dialogs most of all that Aristotle seems to proclaim the immortality of the soul.

F70 *R40 Proclus, On Plato's* Timaeus *323.26–324.4*

And Aristotle, emulating Plato, in *De Anima* deals with the soul in a way appropriate to natural science mentioning neither the soul's descent nor its destinies. But in the dialogs, he dealt separately with these issues and set down the principal argument.

F71 *R41 Proclus, On Plato's* Republic *2.349.13–26*

Heaven-sent Aristotle also stated the cause due to which the soul, when it comes here from there, forgets the sights [it saw] there, but when it leaves this place here it remembers there the experiences [it had] here. And one must accept the argument: for he too says that some people going from health to sickness are susceptible to forgetting even the very letters they had learned, but no one going from sickness to health ever experiences this. He likened life without a body (since it is in accord with nature for souls) to health, and life in the body (since it is contrary to nature[18]) to sickness. For souls live there in accord with nature, while those down here live contrary to nature. So it makes perfect sense that it happens that, when souls come from there, they forget the things up there, but the ones going from here to there remember the things down here.

F72 *R42A Damascius, On Plato's* Phaedo *Versio 1, 530.4–6*

That it is necessary for a whole kind of human being to be nourished in this way[19] is clear from the case of the person who is nourished only on sunbeams, whom Aristotle recounts as having himself seen.

F73 *R42B Damascius, On Plato's* Phaedo *Versio 2, 138.1–2*

If, as Aristotle reports, there is a human here who does not sleep and feeds only on sunlike air, what must one suppose is the case for those there?

F74 *R43 Plutarch,* Quaestiones Conviviales *733C5–8*

Aristotle reports that the wet nurse of Timon in Sicily hibernated for two months every year and could be discerned to live only by her breathing.

F75 *R44 Pseudo-Plutarch,* Consolatio ad Apollonium *115B–E*

Not just nowadays, but long ago, as Crantor says, human affairs have been lamented by many wise men, who consider life to be retribution and its starting-point, the birth of a human being, to be the greatest misfortune. Aristotle says that Silenus declared this to Midas when he was captured. But it is better to quote the very words of the philosopher. He says the following, then, in the work titled *Eudemus* or *On the Soul*: "'That is why, greatest and most blessed one, in addition to considering the dead as being blessed and happy, we consider it impious to lie about them and blaspheme them, because they have now become better and greater people. These customs of ours are so old and so ancient that no one knows at all their starting-point in time nor who set them down first, but they have been continuously acknowledged for an unlimited period. And in addition to this, indeed, you see it in what is repeated through the mouths of humans over and over from ancient times.' 'What is that?' he asked. The other, said in reply, 'Therefore it is best of all not to be born, and being dead is better than living. And

18. Reading ὡς παρὰ φύσιν.
19. I.e., on food intermediate between heavenly food and ordinary food of this world.

many things sent from heaven testify to this.'[20] They say this happened to Midas, after the hunt where he captured Silenus, questioning him and asking what the best thing for humans is and what is the most choiceworthy of all things. At first he did not want to say anything but to keep his silence and not break it. But after a time, after using practically every contrivance, Midas led him to utter something to him, and, under compulsion, Silenus said: 'Short-lived seed of a suffering daimon and hard luck, why are you forcing me to say what is better for you not to know? For life with ignorance of one's own evils is least painful. But for human beings it is altogether impossible for the best thing of all to occur or to participate in the nature of what is best; for it is best for every man and woman not to have been born. However, the next best thing to this, and the first one practicable for a human being, is for those who have been born to die as quickly as possible.' He showed clearly in this way, then, how passing one's time in being dead is better than doing so in living."

F76 *R45A John Philoponus, On Aristotle's* De Anima *141.23–142.6, 144.22–25, 144.30–145.9 (407^{b}27)*

Aristotle, having criticized collectively everyone who has spoken about the soul for not having at all discussed the body that receives it, . . . appropriately connects this with a belief about the soul that follows from it. For some people, having looked to the same matter—namely, that it is not possible for a random body to partake of soul, but rather it needs a certain blend, just as a harmony too does not come about in random strings, but needs an arrangement of a certain sort—thought that the soul too was a harmony of the body and that the different forms of souls correspond to different harmonies of the body. He sets out this belief and refutes it. And till now, he only recounts this belief in this work,[21] but a little later he also sets forth the arguments through which people were led to this view. Already in other works (I mean the dialog *Eudemus* in particular) he has argued against the belief. And before him, Plato in the *Phaedo* used five arguments to object to this belief. . . . As I already said, Aristotle himself also made use of two of them in the *Eudemus*. The first was the following: for harmony, he said, there is something contrary to it, discord. But there is no contrary to the soul. Therefore, the soul is not a harmony. . . . The second argument is this: discord of the body is contrary to harmony of the body, but discord of an animate body is disease, weakness, and ugliness: disease is the lack of proportion in the elements, weakness is the lack of proportion in the uniform parts, ugliness is lack of proportion in the instrumental parts. Now if discord is disease, weakness, and ugliness, harmony would be health, strength, and beauty. But the soul is none of these. I mean that it is neither health nor strength nor beauty; for even Thersites had a soul despite being very ugly. Therefore, the soul is not a harmony. And he used these in those works, but he used

20. *EE* 1215^{b}20–22.
21. *De Anima*.

four destructive arguments against this belief here,[22] the third of which is the second one stated in the *Eudemus*.

F77 *R46 Simplicius, On Aristotle's* De Anima *221.28–33 (429^{a}10)*

And because of this, he [Aristotle] says in the *Eudemus* too, the dialog he wrote about the soul, that the soul turns out to be some sort of form, and in these works he praises those who say that the soul is receptive of the forms, not the whole soul, but the part with understanding, as the [whole soul] is capable of knowing the true forms [only] in a secondary way. For the true forms correspond to the understanding, which is greater than the soul.

F78 *R47A Pseudo-Plutarch,* De Musica *1139B*

Aristotle, Plato's student, says that harmony is something dignified, divine, and great in the following words: "Harmony is heavenly, having a divine, beautiful, heaven-sent nature; and by being naturally four-parted in capacity, it has two means, the arithmetical and the harmonic, and its parts, their magnitudes, and their relations appearing to have numerical and geometrical proportion. For songs are measured in two tetrachords." Having said these things, he composed its body from unequal parts, which nonetheless harmonized with each other and in fact its means harmonize in accord with arithmetical proportion. For the lowest note is fitted to the highest in a ratio of 2:1, composing the interval of the octave. . . . Aristotle showed, at any rate, that the capacities themselves have the following sorts of ratios: the lowest note exceeding the middle by a third part of itself, the highest exceeding the next above the middle in the same way. . . . Harmony, according to Aristotle, naturally exists in its parts and quantity in this way.

F79 *R48 Olympiodorus, On Plato's* Phaedo *9*

Proclus, however, wishes the heavenly bodies to have only sight and hearing, just like Aristotle. For they have only those perceptual modalities that contribute to the good, and not those that merely contribute to existence, while the other perceptual modalities contribute to existence. The poet testifies to this with the words "Helios, who watches and listens to all things,"[23] as if [the heavenly bodies] had only sight and hearing. And these perceptual modalities know by being active rather than by being passive and are more appropriate to the heavenly bodies as they are unchanging things.

1.5 *ON PRAYER*

F80 *R49 Simplicius, On Aristotle's* De Caelo *485.19–22 (292^{b}10)*

That Aristotle has conceived of something above both the understanding and substance is clear at the end of the book *On Prayer*, where he says perspicuously that the god is either understanding or something beyond the understanding.

22. *De Anima*.
23. Homer, *Iliad* 3.277.

1.6 *PROTREPTICUS*[24]

F81 *R50 Stobaeus,* Anthology *4.32.21*

Zeno said that Crates, when sitting in a shoemaker's workshop, read Aristotle's *Protrepticus*, which he wrote for Themison, king of Cypriots, saying that nobody possesses more goods for doing philosophy; for he has great wealth, so that he is able to spend money on this, as well as a good reputation. . . .

F82 *R51A Alexander of Aphrodisias, On Aristotle's* Topics *149.11-15 (110ª23)*

If someone were to say that one should not philosophize, then, since to philosophize is said to be to inquire into this very question of whether one should philosophize or not, as he [Aristotle] himself said in the *Protrepticus*, and also to pursue philosophical contemplation, when we show that each of these is proper to human beings, we refute the thesis on all sides.

F83 *R51B Elias, On Porphyry's* Isagoge *3.17–23*

Aristotle too . . . in the work entitled *Protrepticus*, in which he exhorts the youths to philosophy, . . . speaks in this way: if one must philosophize, one must philosophize and if one must not philosophize, one must philosophize; therefore, one must philosophize in every case. For if philosophy exists, we are obliged in all cases to philosophize. But if it does not exist, even in this case, we are obliged to inquire how it is [possible] for philosophy not to exist, but in inquiring we philosophize, since inquiring is the cause of philosophy. . . .

F84 *R52 Iamblichus,* On the General Science of Mathematics *79.1–81.7 (Festa)*

Some ancients and some moderns have arisen, who have expressed the contrary belief about mathematics, censuring it as completely useless and contributing nothing to human life. Some attack this thesis in the following way. If their end—that is, the reason for which philosophers say that one should learn them—is useless, then, much more radically, serious engagement with these things is necessarily vain. But about the end, all those who seem to speak most exactly about it pretty much agree. For some say that it is scientific knowledge of the things that are unjust and just, bad and good, being similar to geometry and other sciences of this sort, while others say that it is wisdom[25] about nature and that sort of truth, which those in the circle of Anaxagoras and Parmenides introduced. Indeed, someone investigating these things should not be unaware that all goods and all things that benefit the life of human beings lie in use and

24. D. Hutchinson and M. Johnson, "Authenticating Aristotle's *Protrepticus*," *Oxford Studies in Ancient Philosophy* 29 (2005): 193–294, plausibly argue that Iamblichus, our chief source for this work, does not substantially reorder or reword his own source for it, but excerpts it and inserts short bridge passages. No attempt has been made to separate one from the other.

25. *Phronêsis*, usually in particular "practical wisdom," generally has a less specific meaning in the *Protrepticus*, and is then translated as "wisdom."

action and not in knowing alone. For neither are we healthy by knowing what produces health but rather by bringing these to the body, nor do we become wealthy by knowing wealth, but rather by acquiring a lot of property. Nor do we live well—the greatest thing of all—by knowing some things that are, but rather by acting well; for this is truly to be happy.

So it is fitting that philosophy—if indeed it is beneficial—is either an action [generating] good things or useful for actions of this sort. However, it is clear to all that it itself is not a [productive] working of things—nor are any of the sciences previously mentioned. And that it is not useful for actions one could observe from the following. For we have the greatest example in the sciences similar to it and the underlying beliefs. For those things that the geometers are able to contemplate through demonstration, these same things we see them being unable of achieving through action. Rather land surveyors are able to divide parcels of land and all the other features of magnitudes and places because of their experience, while people dealing with mathematical objects and their accounts know how one should act, but are not able to act.

It is the same with music and the other sciences in which the knowledge-part and the experience-part are divided off from each other. For those determining the demonstrations and deductions, just like the philosophers, are used to investigate harmony and other such things, but do not take part in any of the works. But even if they happen to be able to somehow handle them, when they know the demonstrations as well as could be, they immediately do these very things worst, as if intentionally. On the other hand, those ignorant of the accounts, but trained and having correct beliefs, are completely and entirely superior when it comes to practical needs. And so too, when it comes to astronomical issues, for example, concerning the sun, moon, and other stars, those who have studied the causes and accounts know nothing useful for human beings. But those having what they call "navigational science" are able to foretell storms and winds for us. So sciences of this sort will be completely useless for actions; and if they leave behind correct actions, love of learning leaves behind the greatest goods. Contradicting them, we say that the mathematical sciences are also able to contribute. . . .

F85 *R53A Cicero,* Tusculan Disputations *3.28.69*

Thus Aristotle, when reproaching the ancient philosophers who supposed that philosophy had been completed due to their ingenuity, said they were either incredibly stupid or incredibly arrogant; all the same he added that he saw that, since in a few years a great addition has been made, in a short time philosophy would be absolutely complete.

F86 *R53B Iamblichus,* On the General Science of Mathematics *83.6–22 (Festa)*

Most recently, then, admittedly, exact speech about the truth is characteristic of pursuits. For after the destruction and the great flood, people were first forced to "philosophize" about matters concerning food and living, and when they were better resourced, they elaborated the crafts directed toward pleasure, such as music and the like, and when they went beyond the necessities they tried to philosophize in the

[proper] way. Nowadays those who have investigated geometry, speeches, and other sorts of education have advanced to such an extent, in the shortest time from the smallest beginnings, that no other kind of person has done in any craft knowledge. And in fact while everyone urges the other crafts on by honoring them in common and paying wages to those who possess those crafts, we not only do not exhort them to busy themselves with these [other] things, but often even prevent them; nonetheless, they devote themselves most of all to them anyway because they are most important in their nature. For what is posterior in coming to be is prior in substance and completeness.

F87 *R57 Oxyrrhynchus Papyrus 666*[26]

. . . prevents them from both [saying and] doing something they have deliberately chosen that they should do. That is why, observing the bad luck of these people, we should avoid such things and think that happiness consists not in obtaining many things but rather in how the soul is disposed. For even about a body, one would not say that the one decorated with splendid clothes is blessed, but the one that has health and is excellently disposed, even if it has none of the things mentioned. It is the same way with the soul too: if it is educated, it is the soul of this sort and a human being of this sort that are rightly called "happy," not one splendidly decorated on the outside but himself worthless. For neither would we think a horse worth anything, if it had a golden bridle and expensive equipment although it was bad; instead, we rather praise the one which is disposed in an excellent way. Apart from the things mentioned, when those who are not worth anything happen to be given abundant possessions and to get the goods that come through luck, then these possessions prove of more worth than they themselves; which is precisely the most shameful thing of all. For just as it would be ridiculous if someone were worse than his own household slaves, in the same way one must think that the people for whom their property happens to be of more worth than their own nature must be considered wretched. And it is this way in accord with the truth. For, as the proverb says, "Abundance begets wanton aggression, but lack of education together with power begets foolishness," since neither wealth nor strength nor beauty is among the good things for those whose souls are badly disposed. In fact, as these very dispositions are present more and more, to this same extent the possession brings more and greater harm to those who possess them, if they prove to be without wisdom. For "no knife for a child" is the same as "do not put power in the hands of bad people." All would agree that wisdom comes about as a result of learning and inquiring, the capacities of which are encompassed by philosophy. Thus, how would it be possible not to philosophize without hesitation.

26. Cf. R57 Stobaeus, *Anthology* 3.3.25.

F88 *R59 Boethius,* Consolation of Philosophy *3.8*

What if, as Aristotle says, human beings used the eyes of Lynceus, so that their vision penetrated obstacles; would it not then be the case that, if one looked into his internal organs, that outwardly beautiful body of Alcibiades would seem utterly disgusting?

F89 *R61B Cicero,* On Ends *2.13.40*

A human being, as Aristotle says, is born for two things, understanding and acting, as a sort of mortal god.

F90 **Iamblichus,* Protrepticus *5–12 (Pistelli 34.5–61.4)*[27]

5. |34| The following sort of approach leads to the same end. Every nature, |34.5| as if possessing reason, does nothing randomly, but rather does everything for the sake of something. Indeed, banishing randomness, it gives more heed to the for-the-sake-of-which than even the crafts, because it is nature that the crafts are imitations of. Since the human being is by nature composed of soul and body, and |34.10| the soul is superior to the body and the inferior serves for the sake of the superior, the body too is for the sake of the soul. Of the soul, one part has reason and the other does not, the latter being inferior too, so that the non-rational part is for the sake of the part having reason. Within the part having reason is the understanding. So |34.15| the demonstration necessitates that all things be for the sake of the understanding.

Of the understanding, the acts of understanding are activities, since they are acts of seeing intelligible objects, just as the activity of the organ of sight is seeing the visible objects. Indeed, all things choiceworthy for human beings are for the sake of the act of understanding and the understanding, if indeed the other parts are choiceworthy for the sake of the soul, |34.20| and the understanding alone is the best part of the parts in the soul, and the others are composed for the sake of the best.

Again, among thoughts, the free ones are all those that are choiceworthy because of themselves, while those that bring about knowledge because of other things are like slaves. And in all cases what is [pursued] because of itself is better than what is [pursued] |34.25| because of something else, since the free is better than what is not free.

Indeed, when actions use thought, even if it is the understanding **|35.1|** that suggests what is beneficial and guides thought, nonetheless it follows along with these actions, and so also needs a body that serves it and, indeed, is infected with luck too, on behalf of those things our actions aim at—actions over which the understanding has control, though the majority of them come about through the body.

So, among thoughts, those that are choiceworthy because |35.5| of bare contemplation are more estimable and better than those useful for other things. Acts of contemplation are estimable because of themselves, and within these, theoretical wisdom of the understanding is choiceworthy, while thoughts in accord with practical wisdom

27. Portions of this passage are included in R52B, R55, R58B, R59A, R60A, R61.

are choiceworthy because of [other] actions. So the good and estimable is found within those acts of contemplation that are in accord with theoretical wisdom, but not |35.10| in any random act of contemplation. For not every apprehension is unconditionally estimable, but the apprehension of the ruling part when it is wise and is of the starting-point of the universe. This may be set down as associated with and appropriate to theoretical wisdom.

A human being deprived of perception and understanding comes to be much the same as a plant, |35.15| but when deprived only of understanding is made beast-like. But if deprived of the non-rational part while remaining within the reach of understanding, he becomes like a god. One must, then, cancel the non-rational feelings to the extent that they are [merely] potential, while using the pure activities of the understanding that look off toward oneself and the divine, and |35.20| must take care to live by the orbits of the understanding, making one's attending eye and love allies with it. For one must not contemplate what has to do with the god and divine things for the sake of actions. For they say it is not lawful to stain the sight of the divine by enslaving it |35.25| to the necessity of human utility. And, in general, one must not welcome understanding because of its uses. . . . Perhaps with a view to these things, [understanding] alone among all **|36.1|** the various capacities that we possess hits the mark, and, from the opposite side, one must order together actions and everything else with a view to understanding and the god, and it is from this that one must also measure the reasonableness of one's particular duties. For judgment that is just and in accord with worth is also alone of all things sufficient |36.5| to equip human beings with true happiness. For the way in which we differ from the other animals only shines through in this sort of life, in which nothing random or without great worth can happen. For while there are some small glimmers of reason and practical wisdom in the other animals, they are entirely bereft of theoretical wisdom, |36.10| which is shared only with gods. As the human being lacks the exactness and strength of the other animals in perception and impulse, and as only that really good thing[28] cannot be subtracted, which they agree is encompassed by the notion of the good, in no way |36.15| would the excellent person who lives in accord with this way of life subject himself to the changes of luck, but free himself—and do so more than anyone else—from those things that are in the grip of luck. That is also why, to have wholehearted confidence is possible for those who remain in this way of life. For who will subtract anything from the person |36.20| who has already alienated himself from everything that can be subtracted, holding on to his true self, living in what is his, and feeding on what is his and on the good life of the immeasurable god with whom he has contact? Let such things suffice as a Pythagorean |36.25| summoning to complete theoretical wisdom.

6. Since we are addressing people, but not those who do have the divine dispensation of life readily accessible, it is necessary **|37.1|** to mix into such addresses exhortations to

28. The life of understanding.

the political and practical life. Let us, then, say the following. The things that are support for our life, such as the body and the things having to do with the body, support it like instruments. But their use is dangerous, and |37.5| the second ones do more harm [than good] to those who do not use them properly. So one should desire to acquire scientific knowledge and use it fittingly. Through this knowledge we will set up all these things well. Therefore, we must philosophize if we are to engage in politics correctly and lead our own lives in a |37.10| beneficial way.

Further, while some sciences produce each of the things that are advantageous in life, others use them, and the ones that are servicing are different from those that command, and what is strictly speaking good lies in the latter ones as if they were more authoritative. |37.15| Therefore, if only the science that has correctness of judgment and uses argument and contemplates the good as a whole—that is, philosophy—is able to use everything and order it in accord with nature, one must philosophize in every way, since philosophy alone contains in itself correct judgment and |37.20| unerring prescriptive wisdom.

Further, since we all choose what is possible and beneficial, one must demonstrate[29] that both of these belong to philosophy, and that the difficulty of acquiring it is outweighed by the magnitude of the benefit; |37.25| for we all labor with greater pleasure on what is easier. That we are able, then, to obtain scientific knowledge about what is **|38.1|** just and advantageous, and further about nature and the rest of truth, one can easily show. For what is prior is always more knowable than what is posterior, and what is better by nature is more knowable than what is worse. For scientific knowledge is of the definite and ordered |38.5| more than of their opposites, and of causes more than of results. And good things are more definite and ordered than bad things, just as a decent human being is more so than a base human being; for these necessarily exhibit the same difference with respect to each other. And prior things are causes |38.10| more than posterior things. For when the prior things are done away with, the things that get their substance from these are also done away with: lengths when numbers are, planes when lengths, solids when planes, and letters when so-called syllables are. So if indeed the soul is better than the body (for it is by nature more ruling) |38.15| and medicine and physical education are [sorts of] craft knowledge and wisdom concerning the body (for we set these down as sciences and claim that some people have acquired them), it is clear that there is some sort of care and craft knowledge concerning the soul and the virtues of the soul and we are able to grasp it, even if |38.20| it is one we are more ignorant about and is harder to know.

It is the same way with matters concerning nature too. For wisdom about the causes and elements **|39.1|** must be much more prior to knowledge of what is posterior. For these are not among the most extreme things, nor do the first things come to be from them by nature, but the other things clearly come to be and are constituted from and through the first ones. For whether fire, air, number, or some other natures are

29. Reading ἀποδεικτέον.

causes—first causes—of the other things, |39.5| it is impossible to know about any of the things while ignorant of these natures. For how could one know language while ignorant of syllables, or have scientific knowledge of these without knowing the letters at all?

Let these things be said, then, about the fact that there is scientific knowledge of the truth and the virtue having to do with the soul, and why we are able to get them. |39.10| And it is clear from the following considerations that this knowledge is the greatest good and the most beneficial of them all. For we all agree that the most excellent and naturally strongest must rule and that the law alone must rule and be in control. And this |39.15| is some sort of wisdom and account stemming from wisdom.

And further, who is a standard for us, who is a more exact defining mark of the goods than the wise person? For whatever things he would choose by choosing in accord with scientific knowledge, these things are good, and their contraries bad. And since everyone chooses |39.20| most of all what is in accord with his own state (for the just person chooses to live justly, the one who has courage to live in accord with courage, and likewise the temperate one chooses to be temperate), it is clear that the wise person will choose most of all to be wise; for that is the work of this capacity. So it is evident that, |39.25| in accord with the judgement with the most control, **|40.1|** wisdom is the greatest of all goods. Then one should not flee philosophy, if indeed philosophy is, as we think, the acquisition and use of theoretical wisdom, and theoretical wisdom is among the greatest goods. And one should not sail to the pillars of Heracles and frequently get into danger for the sake of money, while not doing anything hard and not spending anything for |40.5| wisdom. It would surely be slavish to strive to live rather than striving to live well, to follow himself the beliefs of ordinary people rather than expecting ordinary people to follow one's own beliefs, to seek money but take no care |40.10| at all of what is nobly beautiful.

As regards the benefit [of philosophy] and its greatness, then, I think this has been sufficiently demonstrated. As to why acquiring it is much easier than other goods, one may be persuaded of this from the following. For it seems to me a sign of how easy philosophy is that though there is no reward from people |40.15| for those who philosophize, because of which they would eagerly labor so hard, and that, having given themselves freely to the other crafts, yet in a short time they make more progress[30] in the exact ones.[31] And further everyone's |40.20| being fond of it and wishing to pass their leisure avoiding everything else is no small proof that close attention to it is accompanied by pleasure; for no one wants to labor for a long time. In addition, the use [of philosophy] differs greatly from [that of] all others. For philosophers do not need |40.25| instruments or special locations for their work, but wherever exactly in the inhabited world you settle **|41.1|** your thought down, you touch the truth in the same way from everywhere, as if it were present.

30. Reading προληλυθέναι.
31. I.e., the various branches of philosophy.

So it has been demonstrated that philosophy is possible and why it is the greatest good and easy to acquire, so that it is worth comprehending it eagerly for the sake of all these things. |41.5|

7. One might see the same thing in more familiar terms from the following. Being wise and knowing are intrinsically choiceworthy for all human beings (for it is not possible for them to live as human beings without these) and are also useful for life. For nothing good comes to us that is not brought to completion with |41.10| rational calculations and the operations of wisdom. Moreover, whether living happily consists in enjoyment or in possessing virtue, or in wisdom, in every case one must philosophize; for these come to us most purely through philosophizing.

Further, |41.15| in us there is soul and body, the former ruling and the latter being ruled, the former using and the latter being subordinate as an instrument. In fact, the employment of the ruled and the instrument is always arranged with a view to the ruler and user. One part of the soul is reason, which is precisely what |41.20| naturally rules and judges what concerns us, and another part follows and is naturally ruled. Everything is well-disposed in accord with its own virtue; for what has obtained this [virtue] is good. Also, whenever the greatest, most controlling, and most choiceworthy things have their virtue, then they are well-disposed; |41.25| therefore, the virtue in accord with nature of what is better is better by nature. And what is more of a ruler by nature and more of a leader is better, as human beings stand in relation to the other animals. The soul, then, is better than the body (for it is more of a ruler), and of [parts of] the soul the one having reason and thought is better; for it is |41.30| such as to command and forbid, to say what should and should not **|42.1|** be done in action. And whatever the virtue of this part is must be unconditionally the most choiceworthy of all things, both for everyone generally and for ourselves; for one may set this part of us down, I think, either as what we are exclusively or else what we are most of all.

Further, whenever what is said to be the natural work of each thing |42.5| is completed most nobly, not coincidentally but intrinsically, this must be said to be good and set down as the most controlling virtue, the one in accord with which each thing can naturally accomplish this [work]. The activities of what is composite and divisible are many and different, |42.10| but what is by nature simple and whose substance is not in relation to something [else], it necessarily has a single intrinsic virtue, strictly speaking. If, then, a human being is some simple animal whose substance is ordered in accord with reason and understanding, its work is nothing other than the most exact truth, |42.15| that is, arriving at the truth about the beings. But if it is naturally composed of several capacities, it is clear that, of the several things it can naturally accomplish, the best of them is always its work—for example, of the doctor it is health and of the captain safety. And we cannot say that there is any better work |42.20| of thought or of the thinking part of our soul other than truth. Truth, therefore, is the most controlling work of this part of the soul.

It does this in virtue of unconditional scientific knowledge and to a higher degree in virtue of what is scientific knowledge to a higher degree, and in this way contemplation is the most controlling end. For whenever |42.25| one of two things is choiceworthy because of the other, the one because of which the other is choiceworthy too is even better and more choiceworthy—for example, pleasure is better and more choiceworthy than pleasant things, health than healthy things; for the latter are said to be productive of the former. **|43.1|** Nothing, then, is better and more choiceworthy than wisdom, which we claim is a capacity of the most controlling part in us, to judge one state in comparison to another. For the knowing part, both separately and conjoined with the rest of the soul, is better than the entire [rest of the] soul, and scientific knowledge is its virtue.

Therefore, |43.5| the work of wisdom is not any of the so-called particular virtues.[32] For it is better than all of them, and the end produced is always greater than the scientific knowledge that produces it. Nor is every virtue of the soul in this way its work, nor is happiness. For if it were productive, it would be productive of something distinct, |43.10| as house-building is productive of a house, but is not a part of the house. However, wisdom is a part of virtue and of happiness; for we say that happiness either comes from wisdom or is wisdom itself. According to this argument too, then, it is impossible for this scientific knowledge to be productive. |43.15| For the end must be better than what comes to be, but nothing is better than wisdom, unless it is one of the things just mentioned, but the work of these things is nothing other than it. Therefore, one must say that this scientific knowledge is a sort of contemplative science, since the end cannot be production. Therefore, exercising wisdom |43.20| and contemplating is the work of virtue and the most choiceworthy of all things for human beings, just as, I think, seeing too is for the eyes, and one would even choose to see, even if nothing distinct was going to come about because of it besides the sight itself.

Further, if we are fond of seeing |43.25| for its own sake, this testifies sufficiently that everyone is fond of exercising wisdom and knowing to the utmost degree. Further, if someone is fond of something because something else has followed upon it, it is clear that this person will wish more what brings it about more. **|44.1|** For example, if someone happens to choose to walk because it is healthy, and it occurs to him that running is healthier, and it is possible, he will choose it even more, as soon as he knows this. Further, if true belief is similar to wisdom, if indeed believing truly is choiceworthy |44.5| in that and insofar as it is similar to wisdom because of its truth, and if this belongs more to exercising wisdom, then exercising wisdom will be more choiceworthy than believing truly.

But surely living is distinguished from non-living by perceiving, |44.10| and living is defined by the presence and capacity of perception, and if this is taken away, life would not be worth living, as if life itself were done away with because of perception's being done away with. The modality of sight differs from other perceptual modalities by its

32. Courage, temperance, and so on.

being the most exact, and this is most of all why we choose it. But every perceptual modality |44.15| is a capacity for knowing through the body, as, for example, hearing perceives sound through the ears. If, then, living is choiceworthy because of perception, and perception is a sort of knowledge, and we choose the soul because the soul is able to know things with it, and earlier we said that |44.20| of two things, the more choiceworthy one is always the one to which the same thing belongs to a greater extent, and sight is necessarily the most choiceworthy and estimable of the perceptual modalities, it follows that the wisdom that knows the truth in the most controlling way is more choiceworthy than sight, all the other perceptual modalities, and living. So all human beings |44.25| [must] pursue exercising wisdom most of all. For those fond of living are fond of exercising wisdom and knowing, for they honor it for nothing other than because of perception and most of all **|45.1|** because of sight. For they evidently love this capacity excessively, for, compared to the other perceptual modalities, it is literally some sort of scientific knowledge.

8. It would also not be a bad idea to recall what was put forward based on common conceptions, that is, what is clearly |45.5| apparent to all. Indeed, it is completely obvious to all that no one would choose to live with the greatest wealth and power of all humankind, while at the same time having his exercise of wisdom gotten rid of and being mad, nor if he were to live while enjoying the most intense pleasures, as some deranged people |45.10| live their lives. Everyone, then, it seems, avoids ignorance most of all. And wisdom is the contrary of ignorance, and for any pair of contraries, when one of the pair is to be avoided the other is to be chosen. So, as being ill is to be avoided, in this way being healthy is choiceworthy for us. Then according to this argument too, wisdom, it seems, |45.15| appears to be the most choiceworthy of all things, not due to something else following upon it, just as the common conceptions testify. For even if one were to have everything, but were destroyed and ill as regards exercising wisdom, this life would not be choiceworthy; for one would not benefit from the other goods either. |45.20| So everyone, to the extent that they perceive the exercise of wisdom and are able to taste this thing, think nothing of the other things, and due to this cause none of us would stand to be drunk or a child for his entire life. Because of this, then, although sleeping **|46.1|** is most pleasant, it is not choiceworthy, even if we suppose that all pleasures are present to the person sleeping because while the appearances when asleep are false, when awake they are true. For sleeping and waking do not differ in any way except that the soul often |46.5| arrives at the truth when awake but is always deceived when asleep; for every appearance during sleep is an image and is false.

The soul's love of learning is also proved by how many people avoid death. For one avoids what one does not know, what is shadowy and unclear, |46.10| while one by nature pursues what is clear and known. That is also why we say that it is those who have been the cause of our seeing the sun and the light that we should most of all honor and respect, namely, our father and mother, as the causes of the greatest goods. And they are, it seems, the causes of our wisely knowing and seeing anything. Because of

the |46.15| same thing, we enjoy both people and things that we are used to, and we call those people "dear" whom we know. So these things perspicuously show that the known, the exact, and the evident are prized. If this is so for the known and the exact, it is clear that |46.20| it must also be so for knowledge and exercising wisdom.

In addition, just as in the case of wealth its possession for the sake of living and for the sake of living happily are not the same for human beings, so too in the case of wisdom I do not think we need the same for merely living |46.25| as for living nobly. And though many people may be much excused for doing this (for they pray to be happy but are satisfied even if they are merely able to live), for whoever thinks that **|47.1|** he must not put up with life on any terms, it would be ridiculous not to put up with every labor, and not to make every effort, to acquire the wisdom that knows truth.

One might also realize the same thing from the following, that is, if one |47.5| considers human life in the clear light of day. For one will discover that the things considered great by human beings are all [merely] shadow painting. Hence it is also said correctly that the human being is nothing and that there is nothing stable in human affairs. For strength, greatness, and beauty |47.10| are ridiculous and not worth anything, and beauty seems to be beauty because nothing is seen with exactness. For if someone were able to see sharply, as they say Lynceus was, who was able to see through walls and trees, how on earth could he think such vision to be tolerable, if he saw what bad things [a human being] was composed of? |47.15| And honor and reputation, which are admired more than the rest, are full of indescribable foolery; for to one observing something eternal, it would be silly to be serious about these things. What is great or long-lasting among human things? But on account of our weakness, I think, and life's brevity, |47.20| it seems to be of much value. Which of us, then, when considering these things, would think himself happy and blessed, who have, in the first place, been composed from the outset by nature as if we were all destined for punishment, as the initiates into the mysteries[33] say? For the most ancient ones say this in a divinely inspired way, saying that the **|48.1|** soul "pays penalties" and that we live in retribution for some great errors. For the yoking of the soul to the body seems very much to be due to something of this sort. For just as they say that the Tyrrhenians often torture captives by binding corpses right onto their living bodies, |48.5| so that they are facing each other, fitting each body part to each part of the corpse, in the same way the soul seems to be stretched out and glued onto each of the body's perceptual organs.

Nothing divine or blessed belongs to humans, then, except maybe the only thing worth taking seriously, namely, |48.10| however much understanding and reason there is in us; for this seems to be something of ours that alone is immortal and alone is divine. Besides, by being able to share in a capacity of this sort, even if life is by nature wretched and hard, nonetheless it is administered so gracefully that |48.15| a human

33. Mystery cults in ancient Greek religion initiated new members by revealing secret doctrines and rituals. The sort of view described in what follows is consistent with our evidence about Orphic religion.

being seems to be a god in comparison with the other beings. "For the understanding is the god in us" (either Hermotimus or Anaxagoras said this) and "the mortal period of existence has a portion of a god."

So either one must philosophize or one must say "farewell" to life, since everything else, at any rate, seems to be a lot of foolery |48.20| and trash. In this way, one might rightly summarize the approaches from common conceptions exhorting one to philosophize theoretically and live, as much as possible, the life that is in accord with scientific knowledge and understanding.

9. |49.1| Starting from an earlier point, from the wish of nature, we will proceed to the same exhortation in this way. Some things that come to be come to be from a certain sort of thought and craft—for example, a house and a ship (for a certain craft and thought is the cause of both of these), while other things |49.5| do not come about due to any craft at all, but due to nature. For nature is the cause of animals and plants, and all such things come to be in accord with nature. Nonetheless, some things also come to be due to luck. Indeed, we say that most of the things that do not come to be due to craft, nature, or necessity come to be due to luck. |49.10|

Of the things that come to be from luck, none comes to be for the sake of something, nor does any have an end. But the things that come to be from craft have the end and the for-the-sake-of-which present in them (for the person possessing the craft will always give you an account of why he prescribed [what he did], that is, for the sake of what), and |49.15| this [end] is better than what comes to be due to the end. I mean all the things of which craft is by nature intrinsically, not coincidentally, a cause. For strictly speaking we would set down medicine to be a cause of health rather than of disease and house-building to be a cause of a house rather than of its demolition. Therefore, everything that is in accord with craft comes to be for the sake of something |49.20| and this something is its best end, while what is due to luck does not come to be for the sake of something. For something good might also come about from luck, but nonetheless it is not good by being in accord with luck and insofar as it is due to luck; rather, what comes to be in accord with luck is always indeterminate. |49.25|

But what is in accord with nature does come to be for the sake of something and is always constituted for the sake of something better than what is due to craft. For it is not nature that imitates craft, but **|50.1|** craft that imitates nature, and craft is for assisting and filling up the omissions of nature. For nature itself seems to be capable of accomplishing some things by itself and to require no assistance, but others it is scarcely able or indeed completely unable to accomplish—for example, to begin with, even as regards generation. Though some |50.5| seeds perhaps grow without protection in whatever sort of ground they fall upon, others require the craft of agriculture in addition. In much the same way, some animals too achieve their full nature by themselves, but the human being needs many crafts for its safeguarding, |50.10| both at the time of the initial generation and then the later nourishment.

Further, if craft imitates nature, it follows from this that everything that comes to be by means of the crafts comes to be for the sake of something. For we would set it down that everything that comes to be correctly comes to be for the sake of something. And |50.15| surely what comes to be in a nobly beautiful way comes to be correctly. And everything that comes to be or has come to be, at any rate, in accord with nature, comes to be, or has come to be, in a nobly beautiful way, if indeed what is contrary to nature is base, and what is coming to be in accord with nature comes to be for the sake of something.[34]

And one might see this also from each of our parts—for example, if |50.20| you were to look at the eyelid, you would see that it is not pointless but came to be for the sake of helping the eyes, so that it gives them a rest and prevents objects from falling into the eye. But that for the sake of which something *came* to be is the same as that for the sake of which it *should* come to be—for example, if a ship *should* have come to be for the sake of |50.25| conveyance by sea, that is also why it came to be. But animals are among the things that come to be by nature,[35] **|51.1|** either all of them or, at any rate, the best and most estimable. For it makes no difference if one thinks that many of them have come to be against nature, on account of some sort of deterioration or bad condition. But surely the human being is the most estimable of the animals here [in the sublunary world], so it is clear that it has come to be by nature |51.5| and in accord with nature.

Among the beings, this is nature and the god begot us for the sake of this. When asked what it is, Pythagoras said "to contemplate the heavens," and he used to say that he himself was a contemplator of nature and passed his life for the sake of this. |51.10| They say that Anaxagoras too,[36] when asked what one might choose to come to be and live for, answered the question by saying "for the sake of contemplating the things in the heaven and the stars around it, and also the moon and the sun," as though all the others, at any rate, are worth nothing. |51.15|

Further, if the end of each thing is always better [that the thing itself] (for everything which comes to be comes to be for the sake of the end, and the that-for-the-sake-of-which is better, indeed the best, of all things), and the end in accord with nature is what is naturally completed last in the process of coming to be, if the process of coming to be reaches its limit continuously, |51.20| then, while the parts of the human body reach their end first, the parts pertaining to soul do so later, and in a certain way the end of the better thing always is posterior in the process of coming to be. Thus the soul is posterior to the body and wisdom is last among the things in the soul. For we see this coming to be by nature last in human beings. That is also why old age **|52.1|** lays claim to this alone among the goods. Therefore, some sort of wisdom is by nature our end, and exercising wisdom is the last thing for the sake of which we have come to be. If we have come to be, then, it is clear that we also exist for the sake of exercising wisdom and learning.

34. Reading καὶ ἡ κατὰ φύσιν γένεσις.
35. Rejecting the addition of τε καὶ κατὰ φύσιν.
36. *EE* 1216^{a}11–14.

|52.5| Therefore, according to this argument, at any rate, Pythagoras was correct to say that every human was constructed by the god for knowing and contemplating.

But whether the cosmos or some other nature is the object of this knowledge, we must perhaps inquire about later; for now, though, what we have said is enough |52.10| for us as a first step. For if wisdom is the end in accord with nature, exercising wisdom would be the best of all things. So one should do the rest for the sake of the goods which come to be in oneself, and, of these, one should bring about the ones in the body for the sake of those in the soul, and bring about virtue for the sake of wisdom. |52.15| For this is the highest thing of all.

To search in the case of each science for something distinct to come about, that is, to require that it be useful, is characteristic of someone completely ignorant about the extent to which good things and necessary things are at variance from the start; for they differ the most. For we like the latter because of something else, |52.20| since without them life would be impossible, and they must be called "necessities" and "co-causes," while the former, which we like because of themselves, even if nothing else were to follow as a result, must be called "goods" in the strict sense. For this is not choiceworthy because of that, and that because of something else, nor does this vanish by going on without limit, but instead stops somewhere. It is completely ridiculous, then, |52.25| to seek some other benefit from everything besides the thing itself, and to ask "what is of benefit for us?" and "how is it useful?" For truly, just as we say, such a person seems nothing like the one who knows the noble and good or distinguishes what **|53.1|** the cause is and what the co-cause.

One would see that what we say is all the more true, if someone were to transport us in thought to, for example, the Isles of the Blessed.[37] For in that place there would be no need of anything nor any benefit from anything else; |53.5| only thinking and contemplating would remain, which we say now too is a free life. If this is true, how could one of us fail to be rightly ashamed, who, although having the freedom to live on the Isles of the Blessed, was unable to do so because of himself? So |53.10| the reward of scientific knowledge for human beings is not to be found fault with, nor does it bring about a trivial good. For just as the wise poets say that it is in Hades that we receive the gifts of justice, in the same way it is in the Isles of the Blessed that we receive the gifts of wisdom; so it seems.

So it is no terrible thing if |53.15| it does not appear useful or beneficial; for we say that it is not beneficial but good in itself, nor is it appropriate to choose it because of something else but rather for itself. For just as we travel to Olympia for the sake of the spectacle, even if nothing more were to come from it |53.20| (for seeing is itself better than many possessions), and we are spectators at the Dionysian festival not as if we were getting some money from the actors, but actually handing some over, and there are many other spectacles that we would choose in place of many possessions, in this way too contemplation of the universe |53.25| is to be honored before everything

37. Cf. Cicero, *On Ends* 5.53.

considered useful. **|54.1|** For surely people should not travel with great effort for the sake of being spectators of people imitating women and slaves or people fighting and running but think that one should not contemplate the nature of things and the truth without payment. In this way, then, by |54.5| proceeding from the wish of nature, we made an exhortation to exercising wisdom as good and estimable because of itself, even if nothing useful for human life were to come from it.

10. Moreover, |54.10| one can easily discover, by considering the crafts, that contemplative wisdom brings about the greatest benefit for human affairs. For just as sophisticated doctors and the majority of physical trainers agree that if one is going to be a good doctor or physical trainer, |54.15| one must be experienced about nature,[38] so too good legislators should be experienced about nature—indeed, much more so than those others. For while the latter are craftsmen only of the virtue of the body, the former, since they are craftsmen of the virtues of the soul, and profess to teach about the happiness |54.20| and unhappiness of a city, much more need philosophy in addition. For just as in the other workmanlike crafts, the best instruments are discovered from nature (for example, in building, a carpenter's line, standard ruler, and compass),[39] since some are grasped by means of water, or by means of light |54.25| and beams of sunlight, and it is by judging in relation to these that we examine what, in accord with perception, is sufficiently straight or smooth, in the same way the politician must possess certain defining marks, **|55.1|** derived from nature itself and from the truth, in relation to which he judges what is just, what is noble, and what is advantageous. For just as there[40] these instruments are superior to all others, so too the law laid down most in accordance with nature is the noblest. And this cannot possibly be done without having philosophized |55.5| and known the truth.

In the other crafts they pretty much know that they do not get their instruments and their most exact rational calculations from the primary starting-points themselves, but from secondary, |55.10| tertiary, or more remote ones, and their accounts from experience; but imitation of the most exact things is possible for the philosopher alone of all of them, for he is a spectator of these very things, not of imitations. Just as, then, no one is a good builder who does not use a standard ruler |55.15| or any other instruments of this sort but simply matches them to other buildings, in the same way, probably, if someone legislates in a city or does actions looking at and imitating other human actions and constitutions, such as the Spartan, Cretan, or whatever, |55.20| he will be neither a good legislator nor an excellent one. For it is impossible for an imitation of what is not noble to be noble, nor can an imitation of what is not divine and stable be by nature immortal and stable. Rather, the laws of the philosopher alone among the craftsmen are stable and the actions correct and noble. |55.25| For he alone

38. *Sens.* 436^{a}17–^{b}1, *Juv.* 480^{b}26–28.
39. There may be a lacuna in the text at this point.
40. I.e., in the workmanlike crafts.

lives looking toward nature and the divine, and just like a good captain, **|56.1|** having moored the starting-points of his life to what is eternal and stable, lies at anchor, and lives in accord with himself.

Though this scientific knowledge is contemplative, it enables us to craft everything in accord with it. For just as sight is not productive or a crafter of anything (for its only work is to discern |56.5| and make clear each visible thing), but enables us to do something because of it and helps us most of all with our actions (for we would be pretty much unable to move at all were we deprived of it), so it is clear that, though the scientific knowledge |56.10| is contemplative, we nonetheless do countless things in accord with it, getting some things, avoiding others, and, in general, we acquire everything good because of it.

11. It will become clear from the following that the most pleasant life belongs to those who choose the life that is in accord with understanding. It appears that living is said in two ways, one in accord |56.15| with capacity, the other with activity. For we say that those animals are "seeing" that have sight and are naturally capable of seeing even if they happen to have their eyes closed, and also those that are using this capacity and casting their eye on things. It is the same way with scientific knowing and knowing: in one case we mean to use them and contemplate, |56.20| in the other, to have acquired the capacity and to possess the scientific knowledge. Therefore, if we distinguish living from non-living by means of perceiving, and perceiving is said in two ways, in the strict sense, using the perceptual capacities, and in another sense being capable of doing so (that is why, it seems, we say that someone "perceives" even though **|57.1|** he is asleep), it is clear that "living" follows it and is said in two ways: the one who is awake must be said truly and strictly to "live," but the one who is asleep must be said to "live," because of being capable of changing into this movement, because of which we say that someone is both awake and |57.5| perceiving something.

Because of this and looking to this, whenever the same thing is said of each of two things, but one of them is said to be "affecting" and the other to be "being affected," we will assign the thing said as belonging more to the former—for example, "knowing scientifically" belongs more to the one using than to |57.10| the one having scientific knowledge, and "seeing" belongs more to the one who casts his eye on things than one capable of doing so. For we do not say "more" only in accord with excess in things of which there is a single account, but also in accord with what is prior and posterior—for example, we say health is "more good" than healthy things, |57.15| and what is intrinsically choiceworthy in accord with nature [is more good] than what is productive of it. And yet we see, at any rate, that the account, insofar as it is predicated of both, is not [strictly] the same regarding what is good in the case of beneficial things and what is good in the case of virtue. Therefore, the person who is awake must be said to live "more" than the person who is asleep, and the person who is active |57.20| by his soul "more" than the one who merely has a soul; for it is because of the former person that we say the latter is living, because the latter sort of person is able to be affected or to affect like the former.

Then, in the case of all things, using them is surely this: whenever the capacity is for one thing, someone who does this very thing uses it, but if it is a capacity for a larger number of things, whichever of these is the best |57.25| —for example, with pipes, one uses it either only or most of all when one plays it; for presumably this is so in the other cases too.[41] **|58.1|** One must also say, then, that the one who uses something correctly is using it in the most strict sense; for the end and the natural way [of using something] belong to the one who uses it correctly and exactly. Of the soul too, then, thinking and rationally calculating is the only work, or most of all the work. Therefore, it is now simple and easy for everyone to deduce |58.5| that the person who is thinking correctly lives in the most strict sense, and that the one who has the most truth lives the most of all, and this is the one who is exercising wisdom and contemplating in accord with the most exact scientific knowledge; complete living should then also be attributed to those who are exercising wisdom and are wise. But if |58.10| living is the same thing for each animal as its existence, it is clear that the wise person would of all living things be both most of all and in the strictest sense living, and most of all so during the time when he is active and happens to be contemplating the most knowable of the beings. But complete and unhindered activity |58.15| contains enjoyment in itself, so that contemplative activity is the most pleasant of all activities.

Further, being pleased while drinking is distinct from drinking pleasurably; for nothing prevents someone who is not thirsty, or who has not been offered the drink he enjoys, from being pleased while drinking, not because of the drinking but because it occurs |58.20| at the same time as he is sitting looking at something or being looked at. Thus, we would say that this person is pleased, and is drinking while he is pleased, but not because of drinking and not because of drinking pleasurably. In this way, then, we say that walking, sitting, learning, and every movement are pleasant or painful, not insofar as we happen to be pained |58.25| or pleased while they are present, but rather insofar as we are all pleased or pained by their presence. And in the same way we say that life is pleasant if its presence is pleasant to those who have it, **|59.1|** and that not everyone lives pleasantly who happens to enjoy himself while living, but rather those for whom living itself is pleasant and who enjoy the pleasure that comes from living.

We attribute living, then, to the person who is awake more than to the one who is sleeping, to the one who is exercising wisdom more than to the one lacking wisdom, and we say that the pleasure that comes from living is the one that |59.5| comes to be from the use of the soul; for this is true living. Now, even if there are many uses of the soul, in the strictest sense of all, at any rate, it is exercising wisdom as much as possible. Further, it is clear that the pleasure that comes to be from exercising wisdom and contemplating, either alone or |59.10| most of all, is necessarily the one that comes from living. Therefore, living pleasurably and true enjoyment belong to philosophers alone or to philosophers most of all. For the activity of the truest thoughts, that is, the one being filled with the things that are most of all beings and always stably preserving the completeness it is granted,

41. Reading τοῦτο καὶ ἐπὶ τῶν ἄλλων.

|59.15| this is of all things the most efficacious for gladness. So for the very enjoying of the true and good pleasures too, those who have understanding must philosophize.

12. If one should not only deduce this from the parts [of happiness], but also establish the same thing from higher up, from happiness as a whole, |59.20| let us say explicitly, then, that as philosophizing stands in relation to happiness, so too it is disposed to be in relation to our excellence or baseness. For everyone must choose everything either in relation to it or because of it, and among the things because of which we become happy, certain ones are necessary, |59.25| while others are pleasant. Thus, we set down happiness as either being wisdom or some sort of theoretical wisdom, or virtue, or maximal enjoyment, or all of these. If it is wisdom, it is evident that **|60.1|** living happily would belong only to philosophers. And if it is virtue of the soul or enjoyment, even in this case it would belong only to philosophers or most of all to them. For virtue is the most controlling thing within us and, compared to each other thing separately, wisdom is the most pleasant of all things. |60.5| And similarly if one were to say that happiness is all of these things, one must delimit them by the exercise of wisdom. So anyone who is able must philosophize; for this is either the completeness of living well or, at any rate, most of all, one might say, comparing one to another, the cause of [living well] in our souls. But here [in the sublunary world], on account of |60.10| our kind being perhaps contrary to nature, it is difficult to learn and inquire, and we can scarcely perceive, due to our naturally bad disposition and our living contrary to nature. But were we able to safely return again from where we came from, it is clear that we all would do these things more pleasantly and easily. For now, |60.15| though, having departed from the good things, we do the necessary ones, and those who do this most of all are those who are considered most blessed by ordinary people. But if we were to take the heavenly route and support this life of ours steadily on the orderly star, then we will philosophize |60.20| while living a true life and contemplating beauty with extraordinary contemplation, gazing intently with the soul at the truth, and contemplating the starting-point of the gods, being continuously rejoiced and enjoyed thanks to contemplating, and feeling pleasure **|61.1|** apart from all pain. If we proceed in this way to the whole of happiness, we will discover that philosophizing contributes to it for us. That is why sharing in it is of worth, as being the most excellent and fitting thing for us.

1.7 *ON EDUCATION*

F91 *R62 Plutarch,* Quaestiones Conviviales *8.10 734D*

Florus . . . testifies to Aristotle's claim that polymathy produces many puzzles.

F92 *R63 Diogenes Laertius 9.53*

And [Protagoras] was the first to discover the so-called porter's knot for carrying loads, as Aristotle says in *On Education*, since he was a porter, as Epicurus also says somewhere.

1.8 *NERINTHUS*

F93 *R64 Themistius,* Oration *33*

The Corinthian farmer, being acquainted with Gorgias (not the real Gorgias, but with the dialog Plato wrote to refute the sophist), immediately afterward left the farm and vineyard and offered his soul to Plato and sowed and planted Plato's seeds. This is the man whom Aristotle honors in the Corinthian dialog.

1.9 *SOPHIST*

F94 *R65A Diogenes Laertius 8.57*

In the *Sophist*, Aristotle says that Empedocles was the first to discover rhetoric and Zeno was the first to discover dialectic.

F95 *R66 Diogenes Laertius 6.63*

Aristotle says that [Empedocles] was free and a stranger to all rule, if indeed he declined the kingship when it was given to him, as Xanthus says in the works about him, since he clearly cared more for simplicity.

F96 *R67 Diogenes Laertius 9.54*

[Protagoras] read [*On the Gods*] to the Athenians in the house of Euripides, or as some say in the house of Megacleides. Yet others say in the Lyceum, making use of the voice of his student Archagoras son of Theodotus. Pythodorus son of Polyzelus, one of the Four Hundred, accused him, but Aristotle says it was Euathlus.

1.10 *ON RHETORIC* OR *GRYLUS*

F97 *R68 Diogenes Laertius 2.55*

Aristotle says that countless people composed encomia and funeral orations for Grylus, partially to gratify his father.

F98 *R69 Quintilian 2.17.14*

Aristotle, as he was accustomed to do, and out of pure love for the search of knowledge, thought up some subtle arguments of his own in the *Grylus* [for the conclusion that rhetoric is not a craft]. But he also wrote three books on the craft of rhetoric, and in the first of these, he not only acknowledges it as a craft knowledge, but also assigns it a part of politics, just as he assigns it a part of dialectics.[42]

42. *Rh*. 1359^{b}10.

1.11 *ON POETS*[43]

F99 *Vita Aristotelis Marciana 4 (Janko T3b)*

When [Aristotle] was still young, he received the education that is suitable for a free person, as is clear from the *Homeric Inquiries* written by himself, the edition of the *Iliad* that he gave to Alexander the Great, the dialog *On Poets*, the treatise the *Poetics*. . . .

F100 **Dio Chrysostom 53.1 (Janko T4)*

Aristotle—who they say was the originator of literary criticism and grammar—discusses the poet[44] in many dialogs, on the whole admiring and praising him.

F101 **Philodemus,* On Poems *4, col. 106, 6–10 (Janko F3)*

But it is necessary to look at all the views of Aristotle and his circle—which we have described—concerning imitation.

F102 **Philodemus,* On Poems *4, from col. 107, 6–13 (Janko F6a)*

All objects of each imitation are composed with a view to the people acting. But they produce imitations of the actions of people in action only as regards their words, not through the elaboration of spectacle, but through words.

F103 **Philodemus,* On Poems *4, col. 110, 12–20 (Janko F10)*

Sometimes he happened to wish that people be painted as beautiful, other times as ugly. Of course, paintings by most of the later painters are seen to be of the former, not of the latter. The saying goes "not even Apelles painted them as they truly are."

F104 **Philodemus,* On Poems *4, col. 118, 14–22 (Janko F23)*

We say that as the actors stand to the tragic poets and the rhapsodes stand to the epic poets, so the pipe and lyre players stand to lyric poets.

F105 *R70 Diogenes Laertius 8.57 (Janko F73)*

In *On Poets* [Aristotle] says that Empedocles had a Homeric style and was stylistically competent, being skilled in the use of metaphor and other poetical techniques, and that, although he wrote other poems too, such as the *Crossing of Xerxes* and a *Hymn to Apollo,* his sister—or daughter, as Hieronymus says—later burned these, the *Hymn* unintentionally, the Persian works intentionally, because they were unfinished. And, generally speaking, he says that Empedocles wrote tragedies and political works.

43. Text: R. Janko, *Philodemus* On Poems *Books 3–4 with the Fragments of Aristotle* On Poets (Oxford, 2011).
44. Homer.

F106 *R72A Diogenes Laertius 3.47–8 (Janko F44e)*

They say that Zeno the Eleatic was the first to write dialogs. But Aristotle in the first book of *On Poets* says it was Alexamenus of Styra or Teos—as Favorinus also says in the *Recollections*. But it seems to me that Plato, since he made the form exact, would also justly take home the first prize, as much for its beauty as for its discovery.

F107 *R73 Diogenes Laertius 3.37 (Janko F43b)*

Aristotle says that Plato's form of writing is between poetry and prose.

F108 *R74 Macrobius,* Saturnalia *5.18, 19–20 Willis (Janko F58)*

I set down Aristotle's own words from the second book of *On Poets* where, speaking about Euripides, he says: "Euripides says 'the sons of Thestius' went with their left foot unshod. At any rate, he says that 'on their left foot, they were unshod, while the other had sandals, so they would have their knee light.' But in fact the custom is entirely the contrary for the Aetolians, since they are shod on the left but unshod on the right. For one should, I think, have the leading one light, not the one that stays put.

F109 *R75A Diogenes Laertius 2.46 (Janko F66a)*

According to Aristotle in book three of the *Poetics*, a certain Antilochus of Lemnos and Antiphon the soothsayer were rivals of Socrates, just as Kylon and Onatas were of Pythagoras.

F110 *R76A Pseudo-Plutarch,* Life of Homer *1.3–4, 21–63 Kindstrand (Janko F65a)*

In book three of the *Poetics*, Aristotle says that . . . when the Lydians were being oppressed by the Aeolians and had decided to leave Smyrna behind, the leaders summoned anyone who wished to follow them to leave the city. Homer, who was still a small child, said that he too wished to "join up" (*homêrein*), which is why he was called "Homer" instead of "Melesigenes."

F111 *R81A Proclus, On Plato's* Republic *42.10–20, 49.13–19, 50.17–29 Kroll (Janko F56)*

Why on earth does Plato not allow tragedy and comedy, when these contribute to a purification of the feelings, which cannot be completely shut out nor, on the other hand, is it safe to fill them all the way up? Indeed, they need some movement at an opportune time that, when they are filled up by hearing poetry, makes us undisturbed by them during the rest of the time. . . . Casting out tragedy and comedy is absurd, if indeed through them it is possible to satisfy feelings in due measure and fill up ones that are serviceable for education, since they provide therapy for the painful part of the feelings. And this provided Aristotle and those competing on behalf of these sorts of

poetry in the speeches against Plato great occasion for complaint. We will resolve this by following the previous arguments in the same way. . . .

We also claim that it is necessary for the politician to contrive certain purges of those feelings, but not so that we are led to passionate attachment to these, but, on the contrary, so that we bridle and harmoniously restrain their movements. Therefore, those sorts of poetry that aim at ornamentation and are immoderate in calling forth these feelings are exceedingly short of being useful for purification. For purifications do not reside in excesses but in contracted activities which bear little resemblance to what they are purifications of. Therefore, if we should not make those being educated into lamentation-lovers or laughter-lovers, it would not be necessary for them to be conversant with those imitations that multiply both of these feelings.

1.12 *ON THE POLITICIAN*

F112 *R78 Cicero,* Letter to Quintus *fr. 3.5*

Aristotle wrote with himself as speaker about the most excellent constitution and man.

F113 *R79 Syrianus, On Aristotle's* Metaphysics *168.33–35 (1087^{b}33–1088^{a}14)*

In the second book of the *Politician* . . . [Aristotle] writes explicitly, "The good is the most exact measure of all things."

F114 *R80A Seneca,* On Anger *1.3*

Aristotle's definition does not depart much from ours. For he said that anger is the desire to pay back a pain.

F115 *R80B Seneca,* On Anger *1.9.2*

Aristotle says that anger is necessary and that nothing can be conquered without it, unless it fills the soul and kindles the spirit. However, it is not to be used as a leader but as a soldier.

F116 *R80C Seneca,* On Anger *1.17.1*

Aristotle says that certain feelings, if one uses them well, serve as weapons.

F117 *R80D Seneca,* On Anger *3.3.1*

However, as I said in the previous books, Aristotle stands as a defender of anger and forbids us from cutting it out. For he says that it is a stimulus to virtue. For when it is taken away, the soul becomes defenseless and too sluggish and weak for great enterprises.

F118 **Philodemus,* On Rhetoric *2.175, fr. 15*

According to Aristotle a hare appearing among dogs cannot be saved, nor can someone judged doglike and despicable among human beings.

1.13 *ON JUSTICE*

F119 *Cicero,* On the Commonwealth *3.12*

[Aristotle] filled up a good four large books about justice.

F120 *R82 Demetrius,* On Style *28*

In Aristotle's *On Justice*, at any rate, if the one lamenting the city of Athens were to say "What a great enemy city they captured, as great as their own that they lost," he would have spoken passionately and lamentingly. But if he were to do the same thing using similar endings, "What a great enemy city they took, as great as their own that they forsook," this does not move us to feelings, by Zeus, but moves us to the so-called tears of laughter.

F121 *R83 Athenaeus 6D*

[Aristotle] writes somewhere that "those making public speeches among the crowds spend the whole day relating marvelous things, even with people who have sailed down the Phasis or Borysthenis Rivers, when they know nothing themselves except Philoxenus' *Dinner*, and not even the whole thing."

F122 *R85B Lactantius,* Epitome of the Divine Institutes *c. 55*

Most of the philosophers, but especially Plato and Aristotle, said many things about justice, defending it and extolling this virtue with the highest praise, each offering his own, because it preserves equality in all things: and when other virtues are, so to speak, silent and held within, only justice, which is neither beloved for itself alone nor secret, but is completely outwardly directed and inclined toward doing good, so that it may profit as many as possible.

F123 *R87 Boethius, On Aristotle's* De Interpretatione *27.13*

Aristotle . . . in his work *On Justice* said, "Intelligible objects and perceptual objects are immediately distinguished by nature."

F124 *R89 Cicero,* On Duties *2.16.56–57*

How much more serious and true is Aristotle's censure of us for not being astonished at this pouring forth of riches in order to soothe the masses. But if those who are besieged by enemies were compelled to pay a mina for a pint of water, at first it would seem incredible to us and everyone would be astonished, but if they were to pay attention to it, they allow it as stemming from necessity. But at this enormous expense and boundless outlay, we are not at all greatly astonished, even though no necessity is being relieved nor merit increased, and even though that very pleasure of the masses would remain for an extremely brief time and also so trifling that at the same moment as it is sated, even the memory of the pleasure dies. He rightly concludes that these things

gratify children, women, slaves, and slavish freemen, but can in no way be approved by a serious man who weighs things with firm judgment.

1.14 *ON GOOD BREEDING*

F125 *R91 Stobaeus,* Anthology *4.29A24*

From Aristotle, *On Good Breeding*: "Concerning good breeding in general, I am puzzled as to whom one should call 'well-bred.'" "It makes perfect sense," I said, "that you are puzzled about this. For some matters are disputed both among ordinary people and even more among wise ones, while others are not stated perspicuously—for example, to start with, matters concerning [good breeding's] capacity. I mean, whether it is one of the estimable and excellent things or, as Lycophron wrote, something completely empty. For when he compares it to other goods, he says that the nobility of good breeding is obscure, its dignity a matter of words, since one chooses it [solely] with a view to reputation, while in truth there is no difference between the well-bred and the ill-bred.

F126 *R92 Stobaeus,* Anthology *4.29A25*

In the same work: "Just as there is dispute about what height is good [for us to have], so there is also dispute about whom one should call 'well-bred.' For some people think that the well-bred are those who have good ancestors, as Socrates also thought (since it was due to Aristides' virtue[45] and his daughter's being true to her stock[46]). They say that when Simonides was cross-examined about who was well-bred, he said 'Those from old money.' Nonetheless, according to the same account, Theognis was not right to object, nor was the poet, when he wrote: 'Mortals praise good breeding, but they marry wealthy people.'[47] Or is it not the case, by Zeus, that the man of wealth is more choiceworthy than the one who is poor but has a wealthy great-grandfather or some other ancestor?"

"How could it be otherwise?" he said.

"And so one should marry those who are wealthy rather than those who are well-bred. For the ones who used to be wealthy are well-bred, but those currently wealthy are more powerful. Is it not the same, then, if someone did not take those well-bred to be those from old money, but instead those from old *good* ancestors? For fresh virtue would seem to be better than old virtue and each person has more in common with his father than his great-grandfather, and it is more choiceworthy to be excellent oneself than for one's great-grandfather or another of one's ancestors to be so."

"What you say is correct," he said.

"Then, since we do not see good breeding to be either of these things, mustn't we look in another way to see what it resides in?"

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45. According to one ancient tradition, Socrates was married to Myrto, the great-granddaughter of Aristides the Just, as well as to Xanthippe.
46. *Rh*. 1390^{b}21–23.
47. Euripides, Fr. 399 Nauck.

"We must," he said.

"'Well (*eu*),' of course, signifies something praiseworthy and excellent—for example, well-looking (*euprosôpon*) or well-sighted (*euophthalmon*). For, in accord with its account, it signifies something good or beautiful."

"Certainly," he said.

"Well-looking, then, is having the virtue of looking, and well-sighted is having the virtue of the eye?"

"So it is," he said.

"But surely one sort of family is excellent, another base and not excellent."

"Certainly," he said.

"And we say, at any rate, that each thing is excellent in accord with its own virtue, so that a family would be excellent in the same way."

"Yes," he said.

"Then it is clear," I said, "that good breeding is virtue of family."

F127 *R94 Stobaeus,* Anthology *4.29C52*

"It is evident, therefore," I said, "concerning what we were going through puzzles about before, why those from old money, or from once excellent people, are considered to be more well-bred than those whose acquisition of those goods is closer at hand. For a person's own excellence would be closer at hand than [that of] someone who happens to have an excellent grandfather, so the result would be that it is the good man who is well-bred. And some have spoken in this way, claiming to refute good breeding on the basis of this deduction, just as Euripides too says that good breeding belongs not to those with good ancestors but to whomever is simply a good man. But this is not so. Rather, those who set out the case for ancient virtue inquire correctly. Let us state the causes of this. Good breeding is virtue of family, and virtue is characteristic of excellent people. A family is excellent if many excellent people have naturally come to be in it. And this sort of thing happens when there came to be a good starting-point in the family. For the starting-point has this capacity, namely, to produce many things like itself. For this is the work of a starting-point: to produce many other things like itself. When, then, one such man has come to be in a family, one so excellent that the good coming from him is possessed by many generations, this family is necessarily excellent. For there will be many excellent human beings if the is family is a family of human beings, and horses if the horse is family, and likewise in the case of the other animals. So, it is reasonable that neither the wealthy ones nor the good ones would be well-bred, but those from old money or old good ancestors. For this argument seeks the truth; for the starting-point is superior to all. Nonetheless, those who come from good ancestors are not always well-bred, but rather those who happen to have originators among their ancestors who are good. When a person is good himself, but does not have this sort of natural capacity to beget many like himself, in these cases, the starting-point does not have this sort of

capacity. [But where the starting-point does have this sort of capacity there is][48] virtue of family and those who come from this family are well-bred, not if the father is, but if the originator of the family is. For the father does not beget someone good because of himself, but because he was from a family of this sort.

1.15 *ON LOVE*

F128 *R95 Athenaeus 674B*

Aristotle, in the second book of *On Love*, and Ariston the Peripatetic (whose family is from Ceos) in the second book of his similar *On Love*, say that the ancients, due to hangovers from wine, discovered headbands by coincidence, since binding the temples seemed to help. But later people, while binding the temples, added some decoration appropriate for the pastime of wine drinking, inventing the crown. But it is better for the head to be crowned because all the perceptual modalities are in the head rather than because covering and binding the temples is advantageous when it comes to wine.

F129 *R96 Athenaeus 564B*

Aristotle says that lovers gaze at no part of their beloved's body other than the eyes, where shame dwells.

F130 **Stobaeus,* Anthology *4.21.11*

Aristotle says that [someone's] beauty is a better introduction than any letter.

F131 **Stobaeus,* Anthology *4.21.14*

Aristotle, when asked why love is of beautiful things, said "This is the question of a blind person."

F132 **Al-Dailami, Tübingen Weisweiler 81 (Walzer)*[49]

It is narrated in a book by some ancient author that one day Aristotle's students came to him. He told them: "While I was standing on a hill, I saw a young man on a roof reciting a poem that meant, 'He who is willing to die for the sake of love, let him die so, for, there is no point in love if it evades self-sacrifice.'" His pupil Issus asked him: "Tell us, philosopher, about the nature of love and its consequences." He replied: "Love is a craving that emerges in hearts. When it emerges, it moves, grows, and flourishes fully. When it fully flourishes, the elements of greed overwhelm it. The stronger it grows in the depths of the heart, the more agitated, insistent, longing, worried, and anxious the lover becomes. That is why the lover is eager to achieve what he loves and tries for it so much so that it winds up in anxiety, grief, permanent insomnia, constant thirst, melancholia, and finally, insanity."

48. Added to fill a lacuna in the text.
49. Translated by Hashem Morvarid.

1.16 *SYMPOSIUM*

F133 *Plutarch,* Quaestiones Conviviales *6*

The most eloquent of philosophers, Plato, Xenophon, Aristotle, and Speusippus as well as Epicurus, Prytanis, Hieronymus, and the academic Dion, bear witness that the task of writing up speeches to be given along with drinking is worthy of some effort.

F134 *R100 Athenaeus 188E*

It is unfitting, Aristotle says, to enter a symposium all sweaty and dirty.

F135 *R101 Athenaeus 674F*

As it is in fact also more colorful and graceful to the gods, Sappho commands those sacrificing to wear a crown. But Aristotle, in the *Symposium*, says that we should not offer anything mutilated to the gods, but only what is complete and whole. But what is full is complete and "to crown" signifies a certain fulfillment. Homer: "Young men crowned the mixing bowl with drink" and "but the god crowns their shape with words."[50] For he says that persuasive speech fills out again those whose appearance is without shape. The crown, then, seems to tend to do this. That is why we also provide the contrary when it comes to grief; for we mutilate ourselves by cutting our hair and removing our crowns in sympathy with the distressed.

F136 *R104 Athenaeus 641D–E*

In *On Drunkenness*, Aristotle calls them "second courses" in much the same way we do, as follows: "One must consider dessert (*tragêma*) to be as wholly different from food proper as something to be eaten is from something to be nibbled (*trôgalios*). For the latter is the ancient name among the Greeks for foods served for dessert. That is why the first person who called it the 'second course' seems not to have spoken badly. For the eating of dessert is a sort of after-dinner thing, and desserts are served as a distinct course."

F137 *R105 Pseudo-Julian,* Epistle *24 391B–C*

A fig is not only sweet to taste, but even better as an antidote. As such, it is so beneficial for humans that Aristotle actually says that it is an antidote for every deadly poison, and it is for no other purpose than this that it is served at meals and as a dessert, as if in place of any other divinely protective medicine, it envelops the injurious elements in foods.

F138 *R106 Athenaeus 447A–B*

But as Aristotle says in *On Drunkenness* . . . "something special happens with barley drinks, which they call *pinon*. For those who get drunk on other intoxicants fall on all

50. *Iliad* 1.470, *Odyssey* 8.170.

their parts; for they fall on the left, the right, face down, and face up. But only those who get drunk on *pinon* fall backward and face up."

F139 *R107 Athenaeus 429C–D*

In *On Drunkenness*, Aristotle says: "If the wine is moderately boiled down, those who drink it get less drunk," for when it is boiled down, its capacity becomes weaker. "But older people," he says, "get drunk most quickly because of the small amount and weakness of the heat present in them by nature. And the very young get drunk rather quickly because of the large quantity of heat present in them; for they are easily defeated by the addition of heat coming from the wine. Also, among the non-rational animals, pigs, when fed pressed grapes, get drunk, as do the raven kind and the dog kind, when they eat the plant called 'wine-cake,' and so do monkeys and elephants when they drink wine. That is also why they catch monkeys by getting them drunk with wine and catch ravens with wine-cake."

F140 *R108 Plutarch,* Quaestiones Conviviales *650A*

Florus was amazed that, when Aristotle wrote in *On Drunkenness* that old people are seized by drunkenness the most and women the least, he did not elaborate on the cause, although he did not usually neglect such things.

F141 *R109 Athenaeus 429F*

Aristotle says that from three cotyles of the wine they call *samagoreion* over forty men will become drunk.

F142 *R110–111 Athenaeus 464C–D*

In *On Drunkenness*, Aristotle says, "The so-called Rhodian cups are introduced in connection with drinking both because of the added pleasure they bring to the drinks and because they make the wine less intoxicating when warmed. For they boil myrrh, camel hay, and other sorts of ingredients in water, and when poured into the wine they make it less intoxicating." But in another part he says, "Rhodian cups are produced when myrrh, flowering camel hay, saffron, balsam, cardamom, and cinnamon are boiled together. What is produced from these, when it is poured into the wine, stops drunkenness, so that, when it concocts the breaths, it even enfeebles sexual desire."

1.17 *ON WEALTH*

F143 **Philodemus,* On Household Management *col. 21, 18–35 (Tsouna)*

The clever ones are drawn by the habits of ordinary speech into denying the facts, and then teach as if they were refuting ordinary people, whenever ordinary people apply

predicates to the same things in a way contrary to their own, teaching something that they do not know. This is precisely what happened to Aristotle in developing the argument in *On Wealth* for the claim that the good man is also a good moneymaker, while the bad man is also a bad moneymaker, as Metrodorus showed.

2. Logic

2.17 *ON PROBLEMS*

F144 *R112 Alexander of Aphrodisias, On Aristotle's* Topics *63.9–13*

Since the things said in this way ("Why is this so?" or "What is this?") are not even premises to start with, they cannot be dialectical problems either: rather, things put forward in this way are problems of natural science, as [Aristotle] also said in *On Problems*; for natural things whose causes are unknown constitute problems of natural science.

2.18 *DIVISIONS*

F145 *Philoponus, On Aristotle's* On Coming to Be and Passing Away *226.16–24 (330^{b}15)*

One must inquire about which are the works [Aristotle] calls "*Divisions*," in which he says Plato arranges these things. Now, the commentator Alexander says that the *Divisions* of Plato in circulation is spurious, but it could be, he says, that Aristotle, speaking about the things said in the dialog the *Sophist*, called the things in that work "*Divisions*." But first one must see that there is no "*Divisions*" at all in circulation ascribed to Plato, and that nothing appears in the *Sophist* that is like what Plato is supposed[51] to have said here.

F146 *R113 Alexander of Aphrodisias, On Aristotle's* Topics *242.3–9 (116^{b}37)*

He uses the words "more noble," "more estimable," and "more praiseworthy" in their more common sense. For in the *Division of Goods*, he says that, of the goods, the estimable ones are those that have more the character of starting-points, such as gods, parents, and happiness; noble and praiseworthy ones are the virtues and the activities in accord with them, and the capacities in which there is the possibility of good and bad use; and beneficial, on the other hand, are things that are productive of these same goods and contribute to them. But here the noble, praiseworthy, and estimable seem to be brought under the heading of things that are good as capacities.

F147 *R114 Diogenes Laertius 3.80, 3.109*

Aristotle says that Plato divided things in the following way. . . . And according to Aristotle he [Plato] divided the primary things in this way.

51. *GC* 330^{b}16.

F148 *R115 Codex Marcianus g. 257*

Aristotle's *Divisions*: The soul is divided into three. . .

2.19 *LOGICAL NOTES*

F149 *R116 Simplicius, On Aristotle's* Categories *65.2–10*

But in which category will negations, privations, and the different inflections of verbs be placed? Or rather did Aristotle himself answer this in the *Notes*? For in the *Methodics*, in his notes, and in the *Divisions*, as well as in the other notes titled *On Style* (which, even if it does not seem to some to be a genuine work [of Aristotle's], was nonetheless composed by someone from his school), when putting forward the categories he inserts "I mean these with their endings" or inflections, and combines the teaching of them together with negations, privations, and indefinite terms.

2.20 *CATEGORIES*

F150 *R117A Simplicius, On Aristotle's* Categories *18.16–21*

In *On the Order of Aristotle's Writings*, Adrastus recounts that another book of categories was also transmitted as being by Aristotle and that it was short and in a summary style and was distinguished by a small number of divisions. It began with: "Of the beings, some are. . . ." He records, however, the same number of lines in both works, so by stylistic brevity he means that each of the dialectical arguments was set out in a concise manner.

F151 *R117B Ammonius, On Aristotle's* Categories *13.20–25*

One should know that in the old libraries, forty books of the *Analytics* have been found and two books of the *Categories*. While the latter has the inscription and says at the start: "Of the beings, some are said to be homonymous, others synonymous," the second, which we now have set before us, had the following inscription: "Things are said to be homonymous whose name alone is common, while the definition of their substance is distinct."[52] This one is preferred as being superior in organization and in content, and everywhere proclaiming Aristotle as its author.

2.21 *ON CONTRARIES* (*On Opposites*)

F152 *R118B Simplicius, On Aristotle's* Categories *387.18–388.1*

Since the Stoics think highly of their work on logic, both in other cases and in the case of contraries, they were eager to prove that Aristotle supplied the resources for everything in one book, which was entitled *On Opposites*, which in fact included an enormous number of puzzles; of these, they have provided a small part. And while it is not reasonable to include the others in an introduction, all the ones that the Stoics deal

52. Cf. *Cat*. 1[a]1–2.

with in agreement with Aristotle must be spoken about. An old definition of contraries has been set down (which we mentioned previously), namely, that they are the things in a kind that differ most from each other; Aristotle examined this definition in *On Opposites* and tested it in many ways. For he asked whether the things that differ are contraries, whether the difference can be contrariety, whether the whole distance [between the contraries] is the one that differs the most, and whether the things furthest apart are the same as the things that differ the most, what the distance is, and how one must understand "furthest apart." In the face of evident absurdities, one must add something about the kind, in order that the definition would be, "the things furthest apart in the same kind." And [he asked] what absurdities follow from this, and whether contrariety is characteristic of distinctness, and whether the most distinct things are contraries, and he set down many other refutations. . . . This is but a small part of the puzzles raised by Aristotle in his work *On the Contraries*.

F153 *R119B Simplicius, On Aristotle's* Categories *389.5–10*

Aristotle says in *On Opposites* that justice is the contrary of injustice. But he claims that the just *person* is not said to be contrary to the unjust *person*, but rather that they are contrarily disposed. But if these things are also contraries, he says, "contrary" will be said of things in two ways. For things will either be said to be "contraries" intrinsically (for example, virtue and vice, movement and rest), or else by partaking of contraries (for example, what is in movement would be contrary to what is at rest and the good thing contrary to the bad thing).

F154 *R120 Simplicius, On Aristotle's* Categories *389.28–390.6*

These issues were first distinguished by Aristotle who says that a non-composite is not contrary to the definition of its contrary (for example, practical wisdom is not contrary to ignorance of what is good, bad, and neither good nor bad), but if this is the case, it is in accord with conjunction that the definition is to be set against the definition, and the definitions said to be "contraries" by being of contrary things. And he practices his craft about these matters further: one definitory account is contrary to another if there is a certain contrariety regarding the kind, the differences, or both. For example, the definition of the beautiful (let us say) is concordance of parts with each other, and the contrary to this is discordance of parts with each other. And this contrariety is due to the kind. But in other cases it is due to the differences—for example, white is color able to dilate sight, while black is color able to contract it.[53] For in these, the kind is the same, but the contrariety is in accord with the differences. Then it is said how an account is contrary to an account. Even accounts indicating the substance will be contrary.

53. Plato, *Timaeus* 67d–e.

F155 *R121 Simplicius, On Aristotle's* Categories *390.19–25*

Aristotle, in the book *On Opposites*, asked whether, if someone who loses one of two [contraries] does not necessarily acquire the other, must there be something in the middle, or is this not always the case? For the one losing the true belief does not necessarily take on the false belief, nor the one losing the false belief the true one, but sometimes the change is from this belief to supposing nothing at all, or to scientific knowledge. But there is nothing in the middle of true and false belief, if not ignorance or scientific knowledge.

F156 *R122–123 Simplicius, On Aristotle's* Categories *402.30–403.1*

Aristotle did not take [the distinction between] state and privation from the case of habit, but from the case of what is by nature, and in the latter case the opposition that is in accord with state and privation is said of things in the strict sense. . . . In *On Opposites*, he says that privations are said to be of things that are in accord with nature, habitual things, possessions, and of other things as well. Blindness is a privation of natural things, nakedness a privation of habitual things, lack of money a privation of things present for use. There are also many other sorts of privations, and from some privations there is no release, but from others there is.

F157 *R124 Simplicius, On Aristotle's* Categories *409.29–410.2, 410.25–30*

In the book *On Opposites*, [Aristotle] added the following sorts of contrariety: the things neither good nor bad in relation to the things neither good nor bad, saying in this way that white is contrary to black and sweet to bitter and high pitch to low pitch and rest to movement. . . . Nicostratus reproaches [Aristotle] first [saying] that the division of contraries is incomplete, for he did not add that the indifferent is contrary to the indifferent. However, in the book *On Opposites*, Aristotle adds this, saying there is some manner of opposition of what is neither good nor bad in relation to what is neither good nor bad, as was said earlier. But he did not call them "indifferents," I think, because this more recent meaning of the word "indifferent" was posited by the Stoics.

3. Rhetoric and Poetics

3.22 *COLLECTION OF THE* "CRAFT" *OF THEODECTES*

F158 *Valerius Maximus 8, 14, ext 3*

Aristotle gave books about the craft of rhetoric that he produced to his student Theodectes and then out of offense when the title of this work was ceded to the latter, while claiming

some things in a book of his own, he added that he had discussed them more fully in the books of Theodectes.

F159 *R125 Quintilian 2.15.10–12n*

For that reason, they appear to themselves to be more assiduous, who, though they feel the same about rhetoric, praise it as the power of speaking persuasively. Gorgias makes this its definition . . . as he was compelled to by Socrates. Theodectes does not dissent from this, whether or not the work about rhetoric that bears his name is his or, as it is believed to be, is Aristotle's. In this book, the definition of rhetoric is to lead people by [the power of] speech to what the orator wants.

F160 *R127A Dionysius of Halicarnassus,* On the Combination of Words *2.1–7 (Usener-Radermacher)*

Synthesis, just as its name implies, is a certain sort of placement (*thesis*) of parts one next to the other [in a sentence] (which some people also call elements of speech). Theodectes and Aristotle and those who philosophized with them for a long time named these three: nouns, verbs, and conjunctions, making of them the primary parts of speech.

F161 *R134 Anonymous Seguerianus,* Craft of Political Rhetoric *208 (Rhetores Graeci I p. 454 Sprengel)*

In the *Theodecteian Crafts of Rhetoric*, Aristotle says that the epilog has as its main goal to exhort the listeners, and that we exhort in three ways, referring the things that produce exhortations for each person to his feelings. The first work of the epilog is to awaken feelings. The second is to praise or blame, for the place for these is in the epilog. And the third is to remind the audience of what has been said. And one must not insert things that are easy to remember or that excite no feelings.

3.23 *COLLECTION OF "CRAFTS" OF RHETORIC*

F162 *R136A Cicero,* On Invention *2.2*

Aristotle collected into one place the ancient writers of the "Craft" of rhetoric going all the way back to the first writer, the discoverer of it, Tisias, and has combined with perspicuity their precepts, mentioning them by name, after having sought them out with great care, and explained them assiduously.

F163 *R137 Cicero,* Brutus *12*

Aristotle said that when the tyrants in Sicily were removed and private matters were prosecuted in the courts after a long interval, because that race was of a clever and disputatious nature, Corax and Tisias of Sicily were the first to write about the craft and its precepts. For before them no one was accustomed to speaking with method or craft, although there were several who spoke accurately and in detail. Discussions of

important issues were also written down and prepared by Protagoras, which are now commonly called "common places."[54] Gorgias did the same, composing praises and censures about particular matters, because he considered the proper task of an orator to be able to enhance and in turn diminish something by means of praise and blame.

3.24 *HOMERIC PUZZLES*

F164 *R149 Porphyry 2.13.5–114.7 (Schrader; *B-Scholiast on Iliad 3.277)*

"Helios[55] who oversees all things": Why does [Homer] say that Helios oversees and listens to all things, since, when it comes to his own cattle, he writes that he needs a messenger: "Swift Lampetia with the flowing robe came to Hyperion Helios as messenger that the companions had killed his cattle"? Aristotle solves this puzzle by saying that either Helios sees all things but not all at the same time, or else that Lampetia relayed the message to Helios in the same way sight does to a human being. Or else, he says, it would be fitting for Agamemnon to speak in this way when swearing an oath in single combat, "Helios who oversees and listens to all things," and also Odysseus when speaking to his companions. For indeed he did not see the things in Hades either.

F165 *R166 Porphyry 1.267.1–4; 268.1–3 (Schrader; *B-Scholiast on Iliad 24.15)*

Why did Achilles drag Hector around Patroclus' grave, acting contrary to the customs for the dead? . . . Aristotle says that it is possible to solve this puzzle by referring back to the sorts of customs that were present then, since even now in Thessaly they drag [the dead bodies] around graves.

F166 *R172 Porphyry 2.84.13–17 (Schrader; HQV Scholiast on Odyssey 9.106; T Scholiast on Odyssey 311)*

Aristotle asks how the Cyclops Polyphemus came to be a Cyclops, although neither was his father a Cyclops (since it was Poseidon) nor was his mother a Cyclops. He solves it drawing from the myths: for in fact horses were born from Boreas,[56] and the horse Pegasus was born from Poseidon and Medusa.

*3.25 *POETICS* BOOK 2

F167 *Tractatus Coislinianus*[57] *(Janko)*

1. Of poetry, one part is non-imitative. Of this, one part is historical, another pedagogical. Of the pedagogical, one part is instructive, another contemplative.

54. *Topoi* in Greek.
55. The sun personified as a god.
56. The north wind.
57. So called from the Parisian codex (number 120 in the Coislin collection).

2. [Another part of poetry] is imitative. Of imitative poetry, one part is narrative, another is dramatic, that is, [directly imitative of] action. Of dramatic poetry, one part is comedy, another tragedy, another mime, and another satyr play.

4. Comedy is an imitation of an action that is ridiculous, lacking in magnitude, complete, in embellished speech, with each of its forms used separately in the parts of the work, by people acting and not by narration, accomplishing through pleasure and laughter the purgation of such feelings. Laughter is its mother.

5. Laughter is produced from the style of speech and from the subject matter; from homonymy; from synonymy; from babbling; from paronymy (by adding or subtracting an ending), diminutives, and alteration . . . ; from parody; from transference . . . ; from style of speech.

6. Laughter from the subject matter: from deception; from likeness, used either for the better or for the worse; from what is impossible; from what is possible but does not follow; from things that are contrary to expectation; from making characters with a tendency to wickedness; from using unrefined dancing; when someone who has the power misses the best things and gets the most base ones; whenever speech is disconnected and has no inferential structure.

7. Comedy differs from abuse, since abuse openly recounts the bad things, but comedy requires what is called "innuendo."

8. The mocker wants to expose faults of soul and body.

9. There should be proportionality of fear in tragedy and of what is ridiculous in comedy.

10. The forms[58] of comedy: plot, character, thought, style of speech, music, spectacle.

11. The comic plot is one composed around ridiculous actions.

12. The characters of comedy are the buffoons, the self-deprecators, and the boasters.

13. There are two parts of thought: maxim and means of persuasion. There are five means of persuasion: oaths, agreements, witnesses, tortures, and laws.

14a. Comic style of speech is common and popular.

58. I.e., the parts.

14b. It is necessary for the comic poet to attach to the characters their own native dialect and the local dialect to himself.

15a. Song is special to music; thus, it is from the latter that one must take the completed resources.

15b. Spectacle provides as a great benefit to plays what is in concord with them.

16. Plot, style of speech, and song are observed in all comedies, but thought, character, and spectacle in not a few.

17. There are four parts of comedy: prolog, choral part, episode, and exit. The prolog is the part of a comedy before the entrance of the chorus. The choral part is the song sung by the chorus, whenever it has sufficient size. The episode is the part between two choral songs. The exit is the part spoken at the end by the chorus.

18. [The three types of comedy]: old, which has an overabundance of what is ridiculous; new, which abandons this and inclines toward the dignified; and middle, which mixes these two.

4. Ethics

4.25 *EXCERPTS FROM PLATO'S* REPUBLIC

F168 *R180 Proclus, On Plato's* Republic *8.12–14*

They also testify that the title "*The Republic*" was very old. For Aristotle, when excerpting the treatise says he is "excerpting *The Republic.*"

4.26 *RULES FOR COMMUNAL MESSES*

F169 *Athenaeus 186B*

The philosophers gathering young men with them took care to feast according to some rule that had been set down. Indeed, there were rules for drinking parties by Xenocrates in the Academy and also by Aristotle.

4.27 *ON THE COHABITATION OF MAN AND WOMAN*

F170 *R182C David,* Prolegomena to Philosophy *74.17–25*

[Aristotle] also wrote *On Economics*, in which he discussed the management of the household. In that work, he says that it is necessary that four things concur for the composition of the household: the relation of man to wife; the affection of the father for children; the fear of household slaves for the master; and that there is a balance of

income and expenditures. For both sorts of imbalance are shameful. For if income were found to be great and expenditures small, that would be something shameful; for such a person would be found to be a money-lover. But if income were found to be small and expenditures large, that would be something shameful; for such a person would be found to be wasteful.

F171 *R183 Clement of Alexandria,* Paedagogus *3.12.84*

I would advise married men never to kiss their wives at home in front of the household slaves. For Aristotle did not permit even smiling in front of slaves, still less that a wife appear to be embraced before their eyes.

5. Philosophy

5.29 *ON FORMS*

F172 *R185A Syrianus, On Aristotle's* Metaphysics *120.33–121.4 (1089^{a}9–15)*

That [Aristotle] has in fact nothing more than this to say against the theory of Forms is made clear both by the first book of this treatise and by the two books that treat things about the Forms. For it is pretty much by everywhere transferring the same arguments, sometimes chopping them up and subdividing them, sometimes announcing them more in a summary, that he attempts to refute the philosophers senior to him.

F173 *R186 Scholiast to Dionysius Thrax, 116.13–16 (Hilgard)*

One must see that the definitions are of universals and of things that always remain, as Aristotle also said in *On Forms*, which he composed against Plato's Forms. For while particulars all change and never stay the same, universals are unchangeable and eternal.

F174 *R187–188 Alexander of Aphrodisias, On Aristotle's* Metaphysics *79.3–88.2 (Golitsis)*

> 990^{b}11–13: According to the arguments from the sciences, there will be Forms of all things of which there are sciences.

As [Aristotle] says in the first book of *On Forms*, there are several ways in which [the Platonists] also used the sciences for establishing the Forms. These are the sorts of argument he is recalling here. |79.5|

If it is by referring back to something that is one and the same that every science produces its work and not to any of the particulars, for each science there would be something else beyond the perceptibles that is eternal and a paradigm of the things which come to be in accord with that science. A Form is a thing of this sort.

Further, the things that the sciences are of, these things *are*. But the sciences are of other things beyond the particulars (for these are unlimited in number and indefinite, while the sciences are of what is determinate). |79.10| Thus there are some things beyond the particulars, and these are the Forms.

Further, if medicine is the science not of *this* health, but of health unconditionally, there will be a health-itself; and if geometry is not a science of *this* equal thing or *this* commensurable thing, but of the unconditionally equal and the commensurable, there will be an equal-itself and a commensurable-itself. And these are the |79.15| Forms.

Such arguments, however, do not prove what they set out to prove, that there are Forms. But they do prove that there are some things beyond the particulars and perceptibles. But it is not at all the case that, if there are things beyond the particulars, these things are Forms. For beyond the particulars there are common things, and we say that the sciences are in fact of these.

Further, they show that there are also Forms of what falls under the crafts. For every craft also refers to the things that come about by means of it to some one thing, |79.20| and the things that the crafts are crafts of, these things *are*, and the crafts are of some other things beyond the particulars. And the latter [argument], in addition to the fact that it does not prove that there are Forms, seems to establish Forms of things of which they do not wish there to be Forms. For if, because medicine is not the science of this health but of health unconditionally, there is health-itself, |**80.1**| the same will also be the case for each of the crafts. For a craft is not of a particular or a this, but of that thing unconditionally that it is about—for example, carpentry is of bench unconditionally, not *this* bench, and of bed unconditionally, not *this* bed. And likewise, sculpture, painting, house-building, and each of the other crafts is related in the same way to the things that fall under them. |80.5| Therefore, there will be a Form of each of the things that fall under the crafts, which is precisely what they do not wish.

> 990^{b}13–14 And according to the *one over many* there will be Forms even of negations.

They also use the following sort of argument to establish the Forms. If each of the many men is a man and each of the [many] animals is an animal (and so on in the other cases), |80.10| and if for each of these it is not the case that something is predicated of itself, but there is something that is predicated of all of them that is not the same as any of them, this would be one among the things that are beyond the particular beings, separated from them, and eternal. For it is in every case predicated in the same way of all the things that keep changing numerically. And what is a one over many, separated from them, and eternal, it is a Form. Therefore, there are Forms. |80.15|

[Aristotle] says this argument establishes that there are Forms both of negations and of non-beings. For one and the same negation is predicated of many things, even of things that are not, and it is not the same as any of the things of which it is true. For non-man is predicated of horse, dog, and everything besides man, and because of

this it is a one over many, and not the same as any of the things of which it is predicated. |80.20| And further it always remains true of similar things in the same way. For non-musical is true in the same way of many things (for it is true of all the things that are not musical) and in the same way non-man |**81.1**| is true of the things that are not men. So there are also Forms of negations. But this is precisely what is absurd. For how could there be a Form of non-being? For if someone admits this, there will be one Form of things that are distinct in kind and different in every way, of line, for example, and of man; for these are all non-horses. Further, there will also be one Form of indeterminate and unlimited things, |81.5| and also of things of which one is primary and the other secondary; for man and animal are both not wood, but the former is primary and the latter secondary.[59] And of these they wish there to be neither Forms nor kinds. And it is clear that this argument also does not deduce that there are Forms; but it too tends to prove that what is predicated in common is something other than the particulars of which it is predicated. |81.10|

Further, the very people who wish to prove that what is predicated in common of many things is some one thing, and that this is a Form, establish this from negations. For if the one negating something of many things negates it by referring back to some one thing (for the one who says "a man is not white" and "a horse is not white" does not deny something special to them in each case, but making a reference back to some one thing, denies the same white |81.15| of all of them), then the one affirming the same thing of many things would not affirm something else of each, but there would be some one thing he would affirm—for example, "man"— with reference to one and the same thing; for as with negation, so with affirmation. Therefore, there is something other than being beyond the one in the perceptibles, which is the cause of the affirmation that is both true of many things and common; and this is the Form. This argument, then, [Aristotle] says, |81.20| produces Forms not only of things that are affirmed but also of things that are denied; for in both cases the "one" [referred to] is similar.

> $990^{b}14$–15: According to the argument that there is thinking of a thing that has passed away, there will be Forms of things that pass away; for there is an appearance of them.

The argument from thinking which establishes that there are Forms is like this: if, whenever |81.25| we think of man, footed, or animal, we are thinking of one of the things that *are* and not of any of the particulars (for the same thought remains even when these have passed away), it is clear that there is something beyond the particulars and perceptibles that we are thinking of whether or not they *are*; for surely we are not then thinking of something that is not. And this is a Form and Idea. [Aristotle] says, then, |**82.1**| that this argument establishes Forms of what is passing away, what has passed away, and, in general, of particulars and things capable of passing away, such as Socrates and Plato. For we also think of them and preserve an appearance of them

59. *EE* $1218^{a}1$–8, *Met.* $999^{a}6$–11.

even although they no longer are; for we preserve an appearance |82.5| even of what no longer exists. But we even think of what does not exist at all, like the Hippocentaur and Chimera. So this argument too does not deduce that there are Forms either.

> 990^{b}15–17: Further, of the more exact of the arguments, some produce Forms of relatives, of which we say there is not an intrinsic kind, |82.10| while others imply the third man.

The argument establishing Forms of relatives too is of the following sort. When the same thing is predicated of several things non-homonymously, but as indicating some one nature, it is true of them either by being what is signified by the predicate in the strict sense, |**83.1**| as when we say "man" of Socrates and Plato; or by their being likenesses of the true things, as when, in the case of paintings, we predicate man [of things in them] (for in these cases we indicate the likenesses of men by signifying the same nature in all of them); or because one of them is the paradigm and the others are likenesses, |83.5| as if we were to call both Socrates and his likenesses "men." But we predicate the equal-itself of the things here, although we predicate it homonymously of them. For neither does the same account apply to all of them, nor are we signifying the truly equal things; for the quantity of perceptible things moves and changes continuously and is not determinate, |83.10| nor does the exact account of the equal apply to any of the things here. But neither is the one a paradigm and the other a likeness, for the one is no more a paradigm or likeness of the other than vice versa. But even if one were to allow the likeness not to be homonymous with the paradigm, it always follows that these equal things are equal as likenesses of what is unconditionally and truly equal. But if this is so, there is an equal-itself and an unconditionally [equal], in relation to which the things here, as likenesses, come to be |83.15| and are said to be equal. And this is a Form, a paradigm and not a likeness of what comes to be in relation to it.

This one argument, the one establishing Forms of relatives too, seems to take hold more carefully, more exactly, and more immediately of the proof that there are Forms. For this argument seems not simply to prove that there is |83.20| something common beyond the particulars, like the arguments before it, but that there is some paradigm of the things here, which *is* in the strict sense. For this seems to be characteristic of the Forms most of all.

[Aristotle] says, then, that this argument establishes Forms of relatives too. At any rate, the present proof proceeded in the case of the equal, which is a relative. But [the Platonists] did not say that there are Forms of relatives, because the Forms intrinsically subsist by themselves, since they are some sort of substance, while |83.25| relatives have their being in their relation to each other. Further, if the equal is equal to an equal, there would be several Forms of the equal. For the equal-itself is equal to equal-itself. For, if it were not equal to anything, it would not be equal at all. Further, in accord with this same argument, there will also have to be Forms of unequal things. For of opposites alike, there will either be or there will not be Forms. And the unequal is agreed, |83.30| even by [the Platonists], to be present in several things.

Again, [Aristotle] shows common ground with [the Platonist's] belief, speaking with reference to it as if it were his own by saying "of which we say there is not an intrinsic kind," saying "kind" instead of "subsistent thing or nature," if indeed the relative is like an offshoot, as he says elsewhere.[60]

The argument introducing the third man is the following. [The Platonists] say that the things that are predicated in common of substances both are such things in the strict sense and are the things equal |**84.1**| and similar to them. And further, things that are similar to each other are similar to each other by sharing something that is the same, which is this in the strict sense. And this is the Form. But if this is the case and what is predicated in common of several things were not to be the same as any of those things of which it was predicated, there would be something else beyond it (for that is why man-itself is a kind, because while it is predicated of the particulars, |84.5| it was not the same as any of them). Therefore, there will be some third man beyond both the particulars (for example, Socrates and Plato) and beyond the Form, which is also one in number.

There was a certain argument stated by the sophists leading to the third man, as follows. If, when we say "man walks," we say neither that man, as a Form, walks |84.10| (for the Form is immovable) nor that any of the particulars do (for how could it be one whom we do not know? For we know that man walks, but we do not know of which of the particulars we speak), then we are saying that some other third man beyond these walks. Therefore, there will be a third man, of whom we predicated walking. Although this argument is sophistical, the people who separate the common thing from the particulars |84.15| (that is what those who posit Forms do) concede the foundations of this argument. Phaenias, in *Against Diodorus*, says that Polyxenus the sophist introduced the third man by saying, "If it is always the case that a man is by participating and sharing in the Form of man-itself, there must be some man who will have his being in relation to the Form. But it is neither the man-itself, which is the Form, that has his being by participating in the Form, nor is it some particular man. It remains that there is some |84.20| other third man who has his being in relation to the Form."

The third man is also proved in this way. If what is predicated truly of many things is something other than those things of which it is predicated, separated from them (for this is what those who posit the Forms think they are proving; for because of this, there is something, |84.25| man-itself, according to them, because man is predicated truly of many particular men and is distinct from each of them). But if this is the case, there will be a third man. For if the man that is predicated is distinct from the things of which it is predicated and subsists on its own, and man is predicated both of the particulars and of the Form, there will be some third man beyond the particular men |**85.1**| and beyond the Form. And in the same way there will also be a fourth man predicated of

60. *NE* 1096^{a}21.

the third, the Form, and the particular men, and similarly a fifth one, and so on without limit. But this argument is the same as the first. And this follows for them, since they posited that similar things are similar by participating in something that is the same; |85.5| for both the men and the Forms are similar. [Aristotle] refuted both these arguments, which seemed more exact, the one because it also establishes Forms of relatives, the other because it introduces the third man, and then increases the number of men without limit. And each of the other things of which [the Platonists] say there are Forms of will be increased in the same way.

But others, including Eudemus who clearly does so in *On Style*, have used the first explanation of the third man, |85.10| but he [Aristotle] uses the last one in the first book of *On Forms* and a little later on in the present treatise.

> 990^{b}17–19: And, in general, the arguments for the Forms do away with the things whose existence we, as people who speak of Forms, wish for more than the existence of the Forms.

What [the Platonists] wish for more, indeed most of all, is for the starting-points to exist; for the starting-points are for them |85.15| the starting-points of the Forms too. These starting-points are the one and the indefinite dyad, as [Aristotle] both said a little earlier and also recounted himself in *On the Good*. And these, according to [the Platonists], are also the starting-points of number. These arguments that establish the Forms, [Aristotle] says, do away with these starting-points. And if these are done away with, the things after the starting-points will also be done away with, |85.20| if indeed these come from the starting-points. So the Forms too are done away with. For if, in all cases, everything of which the common thing is predicated is separable and a Form, and if the dyad is predicated of the indefinite dyad, there would be something prior to it and a Form. Hence the indefinite dyad would no longer be a starting-point. But then neither would the dyad, in turn, be primary and a starting-point. For again, |85.25| number is predicated of it as a Form (for [the Platonists] posit that the Forms are numbers); so that number, since it is a sort of Form, would be prior to it. But if these things are so, number will be prior to the |**86.1**| indefinite dyad (which is for them a starting-point), not the dyad to number. And if this is so, the indefinite dyad would no longer be a starting-point, if indeed it is [what it is] by participation in something [else].

Further, the dyad is supposed to be the starting-point of number, but according to the argument just stated number becomes prior to it. But if number is in relation to something (for every number is a number *of* something), and |86.5| number is primary among the beings (if indeed it is prior to the dyad, which [the Platonists] supposed to be a starting-point), then, according to them, what is a relative would be prior to what is intrinsically. But this is absurd; for all relatives are secondary; for "relative" signifies a relation of an antecedently subsisting nature which is prior to the relation that coincidentally belongs to it. For the relative seems to be an offshoot, |86.10| as [Aristotle] said

in the *Ethics*.[61] But even if someone were to say that number is a quantity rather than a relative, it would follow that quantity is prior to substance.

Further, it follows that [the Platonists] must say that the relative is both a starting-point of and prior to what is intrinsically, inasmuch as the Form is, according to them, the starting-point of substances. But the being for a Form consists in the Form's being a paradigm, |86.15| and a paradigm is a relative; for a paradigm is a paradigm of something.

Further, if the being for the Forms consists in their being paradigms, the things that come to be in relation to them, of which these are the Forms, would be likenesses of them, and hence one might almost say that, according to [the Platonists], all things that are constituted in accord with nature become relatives. For they are all likenesses and paradigms.

Further, if the being |86.20| for the Forms consists in their being paradigms, and a paradigm is for the sake of what comes to be in relation to it, and what is because of something else is less estimable than it, then the Forms will be less estimable than what comes to be by relation to them.

> 990^{b}21–22: And all the other things that certain people, by following out the beliefs |**87.1**| held about the Forms, have accepted contrary to the starting-points.

The following are some of the arguments—in addition to the ones already mentioned—that, because of positing the Forms, do away with their starting-points. If what is predicated in common of certain things is their starting-point and |87.5| Form, and if a starting-point is predicated in common of the starting-points and element of the elements, there would be something prior to, and a starting-point of, the starting-points and the elements; hence they would not be starting-points or elements.

Further, a Form is not prior to a Form; for the Forms are all starting-points in the same way. But the one-itself and the dyad-itself are Forms in the same way, as also |87.10| are man-itself, horse-itself, and each of the other Forms. Therefore, one Form will not be prior to another, and so neither will it be a starting-point. Therefore, the one and the indefinite dyad are not starting-points.

Further, it is absurd for a Form to be endowed with form by a Form; for they are all Forms. But if the one and the indefinite dyad are starting-points, a Form will be endowed with form by a Form; for the dyad-itself is endowed with form by the one-itself, since [the Platonists] say that these are starting-points in this way: the one as form, |87.15| the dyad as matter. Therefore, they are not starting-points. But if they do not say that the indefinite dyad is a Form, first of all there will be something prior to it even though it is a starting-point. For the dyad-itself, by participating in which the [indefinite dyad] is itself a dyad, is prior to it, since it is not the dyad-itself. For it is by participation that the dyad will be predicated of it, since it is one of the dyads.

61. *NE* 1096^{a}21.

Further, if the Forms are simple, they would not derive from different starting-points; but the one and the indefinite dyad are different.

Further, the number |87.20| of dyads will be wondrous if the dyad-itself is one thing, the indefinite dyad another thing, the mathematical dyad another thing—which we use when counting and is not the same as either of these—and if yet beyond these, there is the dyad in things countable and perceptible. This is absurd. So it is clear that the consequences of the very things [the Platonists] posited about the Forms |**88.1**| can do away with the starting-points that are more precious to them than the Forms.

F175 *R189 Alexander of Aphrodisias, On Aristotle's* Metaphysics *97.27–98.24 (Golitsis)*

> [991ª8–10: Above all, one might go through the puzzles about what precisely the Forms contribute to perceptibles, either to those that are eternal or to those that come to be and pass away.]

[To prove] that the other things do not exist by mixing with the Forms, as Eudoxus and some others thought, [Aristotle] says it is easy to collect many impossible things that follow from this belief. And they would be these. If Forms are mixed with other things, first of all, they would be bodies; for mixture is characteristic of bodies. |**98.1**| Further, they will have contrarieties in relation to each other; for mixture is in accord with contrariety.

Further, the Form will be mixed either as a whole in each of the things in which it is mixed, or as a part. But if it is as a whole, what is one in number will be in many (for the Form is one in number), and if it in part, what participates in a part of man-itself, not |98.5| what participates in man-itself, will be a man.

Further, Forms would be divisible and partitionable, even though they are unaffected. Then they will be uniform, if indeed all things which have some part of a Form are similar to each other. But how is it possible for the forms to be uniform? For a part of the man cannot be a man in the way that a part of gold is gold.

Further, as in fact [Aristotle] himself says a little later on, in each thing there will not be one Form mixed in but many. |98.10| For if there is one Form of animal and a different one of man, and the man is both animal and man, it would participate in both Forms. And man-itself, the Form, would also participate in animal-itself, insofar as it is also animal. Hence Forms would no longer be simple but composed of many things, and some Forms would be primary and others secondary. But if [man-itself] |98.15| were not an animal, how would it not be absurd to say that a man is not an animal?

Further, if Forms are mixed with the things that are in relation to them, how would they still be paradigms, as [the Platonists] claim? For it is not in this way, by being mixed, that paradigms are causes of why likenesses are similar to them.

Further, they would also be done away with together with what they are in, when those things are done away with. And they would not even be intrinsically separable,

|98.20| but instead would be in the things that participate in them. And in addition to this, they will no longer even be immovable.

And there are other consequences of this belief that [Aristotle] proved to be absurd while examining it in the second book of *On Forms*. That is why he says here "for it is easy to collect many impossibilities against a belief of this sort," since they were deduced there.

5.30 *ON THE PYTHAGOREANS*

F176 *R191A Apollonius,* Historiae Mirabiles *6*

Again, Aristotle . . . said . . . that [Pythagoras] killed a venomous biting snake in Tyrrhenia by biting it himself, and that he foretold the coming civil war to the Pythagoreans; and that is why he departed to Metapontum unseen by anyone. While crossing the river Cosas with others, he heard a strong voice, a voice beyond a human one, "Welcome Pythagoras." Those present were terrified. He once appeared on the same day at the same time both in Croton and Metapontum. Once, while sitting in the theater, he stood up, so Aristotle says, and showed his uncovered golden thigh to those seated next to him.

F177 *R191B Aelian,* Varia Historia *2.26*

Aristotle says that Pythagoras was called the "Hyperborean Apollo" by the people of Croton.

F178 *R192 Iamblichus,* Life of Pythagoras *6.31*

Aristotle too recounts in *On the Pythagorean Philosophy* that the following division was guarded by the men in the greatest secrecy: of the rational animal, one part is god, another is human being, and another like Pythagoras.

F179 *R193 Apuleius,* On the God of Socrates *20.166–7*

If Aristotle is a sufficiently credible authority, as I judge him to be, the Pythagoreans used to be very surprised if someone denied he had ever seen a divine being.

F180 *R194A Aulus Gellius, 4.11–13*

Since these things are unexpected, I have written down Plutarch's precise words: "Aristotle says the Pythagoreans abstained from eating womb, heart, sea anemone, and certain other such things, but made use of others."

F181 *R194B Diogenes Laertius 8.1.19*

Aristotle says they sometimes also [abstain] from womb and red mullet.

F182 *R195 Diogenes Laertius 8.34*

Aristotle says in *On the* [*Pythagoreans*] that [Pythagoras] commanded abstaining from beans either because they are similar to sex organs or else because they are similar to the gates of Hades; for they alone are without joints. Or because they destroy, because they are similar to the nature of the universe, or because they are oligarchic; for they are used in appointment to office by lot. They do not pick up the things that have fallen, for the sake of not being accustomed to eating licentiously or because it is for someone's death.

F183 *R196 Porphyry,* Life of Pythagoras *41*

[Pythagoras] used to say some things in a figurative way and as one does in the mysteries, which Aristotle recorded at great length—for example, that he called the sea "the tears of Cronos," the constellations [of Ursa Major and Minor] "the hands of Rhea," the Pleiades "the lyre of the Muses," the planets "the dogs of Persephone"; while the sound that comes from bronze being struck is the "voice of one of the daimons caught inside the bronze."

F184 *R197 Porphyry,* Life of Pythagoras *42*

Another form of figurative speech is the following: "Do not step over the beam of the balance," meaning do not be greedy. "Do not stir a fire with a butcher's knife," meaning do not provoke someone swelled up and angry with sharp words. "Do not pluck a crown," that is, do not mistreat the laws; for these are the crowns of the city. Again, other things of the same sort: "Do not eat heart," that is, do not cause pain to oneself by grief. "Do not sit on the grain ration," which is do not live in idleness. And "do not turn back when on one's travels," that is, do not hold on to this life when dying. "Do not walk on the highway," by means of which he forbade one to follow the maxims of ordinary people, but to pursue those of the few well-educated people. And "do not receive swallows in one's house," that is, do not make babblers and people who cannot control their tongue your houseguests. "Add a burden to the burdened, and do not help take it off," by which he recommended doing nothing to further indolence, but to further virtue. "Do not wear images of gods on rings," that is, do not hold one's belief and speech about the gods readily accessible and in the open nor announce it to ordinary people. "Make libations to the gods with the 'ear' of the drinking cup." For from this he hinted that one is to honor and hymn the gods with music; for it goes through the ears.

F185 *R199 Theon of Smyrna,* On Mathematics Useful for Understanding Plato *22.5–9 (Hiller)*

Aristotle, in *The Pythagorean*, says that the one participates in the nature of both [even and odd]; for, when added to the even, it makes it odd and, when added to the odd, it makes it even, which would be impossible unless it participated in both natures. That is why the one is also called "the even-odd."

F186 *R200 Simplicius, On Aristotle's* De Caelo *386.9–23*

The Pythagoreans . . . call right, up, and forward "good" and said that left, down, and backward are "bad," as Aristotle himself recounted in his collection of the opinions of the Pythagoreans.

F187 *R201 Stobaeus,* Eclogs *1.18.1c*

In the first book of *On the Philosophy of Pythagoras*, Aristotle wrote that the heavens are one, drawing in time, breath, and void (which always delimits the place of each) from the unlimited.

F188 *R202 Alexander of Aphrodisias, On Aristotle's* Metaphysics *75.15–17 (990^{a}27–32) (Golitsis)*

In the second book *On the Belief of the Pythagoreans*, [Aristotle] recalls the order in the heaven, which the Pythagoreans made to be that of the numbers.

F189 *R203 Alexander of Aphrodisias, On Aristotle's* Metaphysics *38.8–41.2 (985^{b}26–32) (Golitsis)*

What similarities they said there are in the numbers in relation to the beings and the things that come to be, [Aristotle] made clear. For since they supposed that reciprocity and equality are special to justice, |38.10| and found these in numbers, because of this they said that justice is the first equal-times-equal number;[62] for they thought that in each case the first of the things having the same account is most of all that which is said to be. But some said that this number is four, since as the first square number, it is divided into equals and is itself equal (for it is two times two), while others said that it is nine, |38.15| which is the first square from an odd number, three, multiplied by itself. Again, they said that seven is the opportune moment; for it appears that the natural things have their complete opportune times, both of coming to be and of completion, in accord with sevens, as in the case of human beings. For a human being is born in the seventh month, grows teeth in the same number of months, reaches puberty at around |38.20| the second seven-year period, and grows a beard around the third. And the sun, since they say it seems to be the cause of opportune times, is seated at the seventh number, which they call "opportune time." For they say it holds the seventh position among the ten bodies moving around the center, that is, the hearth (for it moves after |**39.1**| the sphere of the fixed stars and the five spheres of the planets). After it, in eighth place, is the moon and the earth is ninth, after which is the anti-earth.

Nonetheless, since seven does not generate any of the numbers less than or equal to ten, nor was it generated from any of them, they also called it "Athena." For two generates four, three generates both nine |39.5| and six, four generates eight, and five generates ten, while four, six, eight, nine, and ten are all generated. But seven neither

62. I.e., square.

generates any number nor is it generated from any number. And Athena is also like this, since she is without mother and forever a maiden. They said that the number five is marriage, because marriage is the union of male and female, |39.10| and, according to them, the odd is male and the even is female, and five is the first number generated from the first even number (two) and the first odd number (three). For, as I said, the odd for them is male and the even female.

They said that the one is understanding and substance (for he[63] speaks of the "soul" as the understanding). Because the understanding is stable, alike on every side, and fitted for rule, |39.15| they say that is the unit and one, but also substance, because substance is primary. The number two is belief, because belief is changeable in both directions; but they also say that it is movement and addition.

Singling out similarities of this sort between things and numbers, they supposed that numbers were the starting-points of things, saying that all beings are composed of numbers. But seeing that the harmonies too are composed in accord with a certain number, |39.20| they said that numbers are also their starting-points; for the octave is in the ratio 2:1, the fifth in the ratio 3:2, and the fourth in the ratio 4:3. And they said that the whole of the heaven is composed in accord with a certain harmony (of which, in fact, the expression "the whole heaven is a number" is indicative), because it is composed of numbers and in accord with number and harmony. For the bodies that spatially move around the center |39.25| have their distances in a proportion, and some travel faster and others slower, making a sound during their movement—the slower ones making a low-pitched sound, the faster ones a high-pitched sound—and since these sounds are in proportion to the distances, they make the sound coming from them harmonious. |**40.1**| And since they say that number is the starting-point of this harmony, it makes perfect sense that they posited that it is also the starting-point of the heaven and the universe. For they said that the ratio of the distance of the sun from the earth or of the moon from the earth is 2:1, that of Venus is in ratio 3:1, that of Mercury is in the ratio 4:1, and they thought that in each of the other cases there is |40.5| some numerical ratio and that the movement of the heavens is harmonious. And they said that the ones moving the greatest distance move the most fast, those moving the smallest one move the slowest, while the intermediate ones move in proportion to the magnitude of their orbit.

From these similarities in the beings to the numbers, then, |40.10| they supposed that the things and the beings are composed of numbers—indeed, *are* certain numbers. And since they thought that the numbers are prior to the whole of nature and to the things that are by nature (for none of the beings could either be, or be at all known, separate from number, while the numbers can be known separate from everything else), they established the elements and starting-points of numbers as the starting-points of all beings. |40.15| These were, as was said,[64] even and odd. And of these, they thought

63. Probably, Aristotle; see *Met.* 985^{b}30.
64. Reading εἴρηται.

the odd limited and the even unlimited; of the numbers, they thought that unit is their starting-point, since it is composed of the even and odd. For the unit is at the same time even-odd, which he[65] used to prove through the unit's being capable of generating both odd and even number. For when added to even it gives birth to odd, |40.20| and when added to odd it gives birth to even.

"And all the concordances they found in the numbers and in their combinations in accord with the harmonies related to the affections and parts of the heaven"[66] taking these as evident in themselves, they proved the heavens are composed of numbers and in accord with harmony. But if any of the things appearing in the heavens seemed to be discordant with the sequence of the numbers, |40.25| they themselves added these and endeavored to fill in the gaps, with a view to the consistency of their entire system. To begin with, at any rate, thinking that ten is the complete number, but seeing nine moving spheres appearing (seven spheres of the planets, an eighth of the fixed stars, a ninth of the earth—for they thought, in fact, |40.30| that it too moves in a circle around the stationary hearth, which according to them is fire)—they themselves added a certain "anti-earth" in their doctrines, which they posited as moving in a direction opposite to that of the earth, and to be invisible to those on earth because of this. |**41.1**| Aristotle speaks about these things with greater exactness both in *De Caelo* and in *On the Beliefs of the Pythagoreans*.

F190 *R204 Simplicius, On Aristotle's* De Caelo, *511.25–31, 512.12–14 (293^{a}15–27)*

The Pythagoreans . . . say that the earth is not around the center, but that there is fire at the center of the universe. And they say that the anti-earth travels around the center, since it is also an earth, but is called "anti-earth" because it lies contrary to this earth. And "after the anti-earth, this earth too travels around the center, and after the earth the moon"; for this is how [Aristotle] himself recounts at the end of *On the Pythagoreans*. . . . That is why some of them call it, the fire, "the tower of Zeus," as he recounts in *On the Pythagoreans*, while others call it "Zeus' guard-post" (as he says in that work), others "Zeus' Throne" (as others say).

F191 *R205 Simplicius, On Aristotle's* De Caelo *392.16–32 (285^{b}8–27)*

How can [Aristotle] say that the Pythagoreans make us [to be situated] up and on the right, but make others [to be situated] there[67] down and on the left, if—as he himself recounts in the second book of the collection *On Pythagoreans*—they say that there is an upper and lower part of the whole heaven and that the lower is the right part of the heaven and the upper the left, and that we are in the lower part? But perhaps here "up" and "on the right" were said not in accord with his own opinion but in the Pythagorean

65. Probably, Pythagoras.
66. *Met*. 986^{a}3–6.
67. I.e., in the other hemisphere.

way. For they put up and forward together with the right, and down and backward together with the left. But Alexander thinks that the things said in the collection *On Pythagoreans* have rather been altered by someone and should say, "The upper part of the heaven is on the right, the lower part on the left, and we are in the upper part," not "in the lower," as was written. For in this way it will agree with what is said here, that in saying that we live in the lower [part] and because of this, on the left (since lower is put together with the left), we speak in the contrary way to what the Pythagoreans say, [that we live] up and on the right. And perhaps [Alexander's] alteration makes sense, since Aristotle knew that they put up together with right and down with left.

5.31 *EXCERPTS FROM THE TIMAEUS* AND *THE WORKS OF ARCHYTAS*

F192 *R206 Simplicius, On Aristotle's* De Caelo *296.16–18 (297^{b}17–21)*

When epitomizing Plato's *Timaeus*, [Aristotle] wrote, "He says that [the universe] is generated, for it is perceptible, and he is supposing that what is perceptible is generated, while the intelligible is ungenerated."

F193 *R207 Damascius,* Puzzles and Solutions *306*

Aristotle, in his work on Archytas, recounts that Pythagoras too called matter "other," because it is in flux and always becoming other [than it is].

5.32 *ON DEMOCRITUS*

F194 *R208 Simplicius, On Aristotle's* De Caelo *294.33–295.22 (297^{b}12–17)*

A few words added from Aristotle's *On Democritus* will clarify the thought of these men:[68] "Democritus thinks that the nature of eternal things consists of small substances unlimited in number, supposing something else as a place for these, unlimited in magnitude, and to this place he applied the names, 'void,' 'nothing,' 'unlimited,' and to each of the substances, 'this,' 'solid,' 'being.' He thinks that the substances are so small that they escape our perception, but all sorts of shapes and all sorts of figures and differences in size belong to them. Then, he thinks that from these, as from elements, the things visible to the eye and perceptible masses are generated and aggregated. And these factionalize and spatially move in the void because of their dissimilarity and also the other differences mentioned, and as they spatially move, they collide and intertwine in such a way that they are made to touch and be close to each other, yet this does not really generate any single nature whatever from these; for it is altogether simpleminded [to think] that two or more could ever become one. And the cause due to which the substances remain together with each other up to a certain point he attributed to the bodies fitting into each other and grasping on to each other; for some of them are

68. I.e., the Atomists.

uneven, others hooked, some concave, others convex, while others exhibit uncountably many other differences. He thinks, then, that they cling to each other until such a time as some stronger necessity arriving from the environment shakes and tears them away from each other." [Democritus] speaks of this generation and the disaggregation that is contrary to it not only in the case of animals, but also in that of plants and cosmoses and, in sum, in the case of all perceptible bodies.

6. Physics

6.33 *PHYSICAL PROBLEMS*

F195 *R211 Simplicius, On Aristotle's* De Caelo *505.23–25 (293ª4–11)*

Aristotle also makes this clear in the *Physical Problems* when he introduces further puzzles about the astronomers' hypotheses on the basis of the fact that the distances between the planets do not appear equal.

F196 *R213 Plutarch,* Questiones Coviviales *6.5*

However, pebbles and whetstones, I said, when we throw them into water, seem to cool and harden it. You will remember this was said by Aristotle. In the *Problems* he only says that this thing happens but let us make an attempt to state the cause.

F197 *R215 Plutarch,* Questiones Naturales *912A*

Why are trees and seeds naturally nourished more by rainwater than running water? . . . What Aristotle said is true, namely, that rainwater is fresh and young, while marsh-water is stale and old.

F198 *R229A Aulus Gellius 3.6*

By Heracles, a wondrous thing is said by Aristotle in the seventh book of *Problems* and Plutarch in the eight book of the *Symposiasts*! If, they say, you place large weights on the branches of a palm tree and press down hard and with force, so that it cannot bear the amount of weight, the palm does not give way downward, nor is made concave, but rises against the weight and pushes upward and becomes convex.

F199 *R232 Apollonius,* Historiae Mirabiles *51*

Aristotle said in the *Physical Problems* something worth knowing. He says that a human being who has eaten and drunk weighs the same as the one fasting. And he also attempts to give the cause of this occurrence.

F200 *R234 Apollonius,* Historiae Mirabiles *9*

Aristotle says in the *Physical Problems*: "Those who eat one meal a day have more spiteful characters than those who eat two."

6.34 *ON THE FLOODING OF THE NILE*

F201 *R246A Photius Bibliotheca 249, 441^{b}1–12*

Seasonal winds travel to the opposite locations. And when brought there [in the south], they collide with the high mountains of Ethiopia and when a lot comes together, rain is produced. And from these rains, the Nile overflows in the summer, flowing from summery and dry places. And Aristotle dealt with this issue. For he learned it from nature by taking action, thinking it fitting to send Alexander of Macedon to these places to ascertain the cause of the increase of the Nile by observation. That is why he says "this is no longer a problem, for it was seen clearly" that its increase derives from the rains.

7. Zoology

7.39 *PERTAINING TO ANIMALS*

F202 *R284 Strabo 15.22.695*

Aristotle recounts cases of septuplets being born and calls the Nile "prolific" and "nourishing," because of the moderate boiling due to sunny days, which leaves behind the nourishment itself and burns up the residue.

F203 *R286 Pliny,* Natural History *11.273*

I truly marvel that Aristotle not only believed that there are some signs of longevity in bodies themselves, but even proclaimed it. . . . As signs of a short life he posits: few teeth, extra-long fingers, dull complexion, and many non-continuous lines in the palm. On the other hand, as signs of long life: sloping shoulders, one or two long lines in the palms, more than thirty-two teeth, and large ears.

F204 *R288 Apollonius,* Historiae Mirabiles *27*

Aristotle, in *Pertaining to Animals* (for there are two treatises by him, *On Animals* and *Pertaining to Animals*) says: "Head lice do not perish during long illnesses, but when those suffering from them are about to die, they are found on pillows, having abandoned the head."

F205 *R297 Athenaeus 286F*

In the work titled *Pertaining to Animals* or *On Fishes*, Aristotle says "those with markings on the back are called '*boax*'[69] . . . , while those marked with oblique lines are called 'coly-mackerels'."[70]

7.42 *MEDICAL ISSUES*

F206 *R373 Galen, On Hippocrates'* On Human Nature *(15.25–26)*

If you want to inquire into the beliefs of the ancient doctors, you can read the books in the medical collection ascribed to Aristotle, but agreed to have been written by Meno, who was his student. That is why some even call these books *Menôneia*. It is clear that this Meno, carefully searching out the books of those old doctors that were still extant, collected their beliefs from there.

7.43 *OPTICS*

F207 *R380 Vita Aristotelis Marciana 170–175 (Gigon)*

In mathematics, he put forward that the cone of sight is at an acute angle, because sight projects further than the magnitude that it sees. For also because of this none of the things seen is seen as a whole at the same time, and hence the axis is longer than its base and the cone is acute angled.

8. History

8.44 *CONSTITUTIONS*

F208 *Cicero,* On Ends *5.11*

From Aristotle we know the customs, institutions, and education of all cities, not only the Greek but also barbarian ones, and from Theophrastus we know the laws.

F209 *R472 Athenaeus 272D*

In the *Aeginian Constitution*, Aristotle says that they had 470,000 slaves.

F210 *R473 Strabo 7.7.2*

In the *Acarnanian Constitution*, Aristotle says that one part of [Acarnania] was held by the Kouretes tribe, another further west by the Leleges tribe, next by the Teleboae. But in the *Aetolian Constitution*, he calls the present-day Locrians "Leleges" and says that they also inhabit Boeotia. He says the same thing in the *Opuntian Constitution* and

69. *HA* 610^{b}4.
70. *HA* 598^{a}24.

the *Megarian Constitution.* In the *Leucadian Constitution*, he also calls a certain Lelex "native." Teleboa, his maternal grandson, had twenty-two children, some of whom inhabited Leucas.

F211 *R483 Harpocration, Entry* [The Council of the] Ten Thousand at Megalopolis [in Arcadia]

The council is shared among all the Arcadians, which historians often mention. And Aristotle discussed them at the beginning of the book, the shared *Arcadian Constitution*.

F212 *R485 Plutarch,* Theseus *16*

Aristotle, in the *Bottiaean Constitution*, is clear that he does not think that the children were killed by Minos,[71] but grew old in Crete as serfs.

F213 *R501A Scholiast on Dionysius Thrax, p. 183.1–5 (Hilgard)*

Some, including Ephorus, say that Cadmus was the second inventor of the alphabet. And some, such as Herodotus in the *Histories* and Aristotle, say that he transmitted the invention of the Phoenicians to us. For they say that, while the Phoenicians invented the alphabet, Cadmus brought it to Greece.

F214 *R504 Etymologia Magna p. 144, 22, Entry* Arkeisios

Aristotle, in the *Ithacan Constitution*, says that when Cephalus settled in the Cephallenian islands, which were named after him, since he was childless for a long time, and on asking the god, he was ordered to mate with whatever female he encountered. He arrived in the country and, when he encountered a she-bear, mated with it in accord with the oracle. When it was impregnated, it transformed into a woman and bore a child, "Arkeisios" from *arktos* ("bear").

F215 *R544B Scholiast on Euripides'* Andromache *446 (p. 165 t. IV Dindorf)*

"O most hateful of mortals to all peoples (shamefully greedy inhabitants of Sparta),". . . and next he says that they are vicious in other ways but especially in their love of money. Aristotle also recounts this in the *Spartan Constitution* and adds the poem spontaneously produced by the god: "Money-loving will destroy Sparta, nothing else."

F216 *R549A Athenaeus 576A–B*

Aristotle too recounts in the *Massalian Constitution* that something similar happened, writing as follows: "Phocaean merchants from Ionia founded Massalia. And Euxenus the Phocaean was a guest-friend of Nanos, the king—this was his name. This Nanos, when he was having his daughter's wedding, met Euxenus by luck and invited him to the feast. The wedding happened in the following manner: after the meal, when the bride entered, she had to give a mixed bowl [of wine] to whichever of the suitors

71. *GA* 724^{b}2.

present she wished, and whomever she gave it to had to be her husband. And when the bride entered, whether by luck or due to some other cause, she gave it to Euxenus. The bride's name was 'Petta.' When this occurred, the father consented, thinking that it was in accord with the god that she gave it, Euxenus took her as his wife and moved in with her, changing her name to 'Aristoxene.' And there is still a clan in Massilia that stems from her, called 'Protiadae,' for Protos was the son of Euxenus and Aristoxene."

F217 *R600 Pliny,* Natural History *7.207*

Aristotle says that the Carthaginians were the first to build the quadrireme, a ship with four rows of oars.

8.46 *CLAIMS*

F218 *R614 Pseudo-Ammonius,* On Similar and Different Expressions *334*

Aristotle recounts the following in his *Claims of Cities*: "Alexander the Molossian, during the same time that the Tarantines sent him to wage war against the barbarians, sailed with fifteen ships, and numerous vessels for cavalry and troops."

8.47 *PYTHIAN VICTORS*

F219 *R615 Plutarch,* Solon *83F*

The Amphictyons were persuaded by [Solon] to go to war, as many testify, including Aristotle in the *Register of Pythian Victors*, who ascribes the proposal to Solon.

8.48 *CATALOGS OF DRAMAS*

F220 *R624 Harpocration, Entry* Catalog of Drama

They specifically call "dramatists" the poets who write dithyrambs, comedies, or tragedies. Antiphon, in his work *On the Chorus Dancer*, says, "They elected Pantacles dramatist by lot." And, in fact, that Pantacles was a poet has been made clear by Aristotle in the *Catalogs of Dramas*.

8.49 *HISTORICAL NOTES*

F221 *R635 Plot of Euripides,* Medea *(p. 143)*

[Euripides] seems to have presented the play as his own after having adapted it from Neophron, as (argued by) Dicaearchus in *The Life of Greece* and Aristotle in his *Notes*.

8.50 *PEPLOS*

F222 *R637 Scholiast to Aristides,* Panathenaicus *(p. 323 Dindorf)*

The order of gatherings, according to Aristotle: First, the Eleusinian because of Demeter's harvest. Second, the Panathenaea for Aster, the giant killed by Athena. Third, the one in Argos that Danaus instituted because of the wedding of his daughters. Fourth, the one instituted in Arcadia by Lycaon called the "Lycaea." Fifth, the one in Iolcus begun by Acastus for his father Pelias. Sixth, the one on the Isthmus that Sisyphus legislated for Melicertes. Seventh, the Olympian that Heracles legislated for Pelops. Eighth, the one in Nemea, which the Seven Against Thebes instituted for Archemorus. Ninth is the Trojan, which Achilles made for Patroklos. Tenth the Pythian, which the Amphictyons founded for the death of Pytho. This is the order of ancient and modern gatherings that Aristotle, the composer of the *Peploi*, wrote out.

9. Speeches and Letters

9.51 *DEFENSE AGAINST EURYMEDON'S CHARGE OF IMPIETY*

F223 *R645 Athenaeus 697A*

Aristotle himself, in his *Defense against the Charge of Impiety*, if the speech is not spurious, says, "For I would never have proposed to sacrifice to Hermias as an immortal, but prepared a memorial to him as a mortal and, wishing to immortalize his nature adorned it with funerary honors."

9.52 *ON KINGSHIP*

F224 *R646 Vita Aristotelis Marciana 94–96 (Gigon)*

In order to be a benefactor of all human beings, Aristotle wrote for Alexander a book *On Kingship*, in which he taught how one must rule as king.

F225 *R647 Themistius,* Orations *8.107CD*

It is right to admire Aristotle, because by altering Plato's words a little bit, he made his account truer, not saying that it is necessary for a king to philosophize, but even a hindrance. Instead, he should be ready to obey and inclined to give ear to true philosophers; for then he would fill his rule with good works, not good words.

9.56 *LETTERS*

F226 *R652A Vita Aristotelis Mariciana 34–40 (Gigon)*

When [Aristotle] turned seventeen, he received an oracle from the Pythian god to practice philosophy in Athens. There he studied with Socrates and stayed with him almost

until the latter's death; after him, he studied with Plato and also stayed with him until his death, for about twenty years, as he himself says in a letter to Philip.

F227 *R654 Vita Aristotelis Marciana 126–128 (Gigon)*

Aristotle appears in his letters to admire Plato and as introducing those in Plato's family to the kings.

F228 *R655 Vita Aristotelis Marciana 75–84, 90–93 (Gigon)*

The philosopher, since he was such an important part of the kingdom,[72] used his power as an instrument of benefaction, performing good services for each individual, for entire cities, and for everyone at the same time. For how much he was a benefactor of particular kings is made clear by the letters written by him to the kings about certain matters. And how much he was a benefactor of entire cities is made clear by Stagira and Eresus (the homeland of his students Theophrastus and Phaenias). For when his native Stagira was razed to the ground by Philip, he persuaded Alexander to found it a second time and give it new lands. . . . And when Eresus was about to be besieged by Philip, he persuaded him to leave it alone. And he provided much benefaction to the Athenians in his letters to Philip.

F229 *R656 Demetrius,* On Style *233*

Aristotle, however, also uses demonstrations suited to letters. For example, when he wishes to teach that it is necessary to be a benefactor of both large cities and small ones, he says: "For the gods in both are equal, so that, since the Graces are goddesses, equal grace will be held in store for you in both." For what is demonstrated and the demonstration itself are both suitable for letters.

F230 *R657 Dio Chrysostom 47.9–11*

I sometimes used to congratulate Aristotle, who was a Stagirite (Stagira was a village in Olynthia). When Olynthus was taken, Aristotle, through his association with Alexander and Philip, managed to bring about the re-founding of the village. I used to say that he was the only one to experience such good luck, that is, to be the founder of his own fatherland. But lately I chanced upon a letter in which he is repenting and lamenting his actions, saying that "some of them[73] are killing the king and governors as they arrive, so that nothing good came of it and the city was not completely founded." . . . Aristotle writes in the letter how he lost heart in the business; he says, in fact, "I throw up my hands. And you must think that I throw up my own hands and if there are others, them too."[74]

72. Reading βασιλείας.
73. I.e., the people in Olynthus.
74. Reading: φησὶ γὰρ αἴρειν τοὺς δακτύλους· κἀμὲ νομίζετε καὶ τοὺς ἰδίους δακτύλους αἴρειν καὶ εἴ τινές εἰσιν ἕτεροι.

F231 *R659 Aelian,* Varia Historia *12.54*

Aristotle, wishing to calm Alexander when he was angry and stop him from being violent toward so many people, wrote the following to him: "Spirit and anger are directed not against lesser people but against greater people; and no one is equal to you."

F232 *R662 Aulus Gellius 20.5.11–12*

Greetings King Alexander from Aristotle. You wrote to me about the esoteric writings, thinking it necessary to keep them secret. Know, then, now that they consist of both published and unpublished accounts; for they are intelligible only to those who hear our lectures. Farewell.

F233 *R663 Aristocles, Fr. 2 (Heiland) from Eusebius,* Preparation for the Gospel *15.2.14*

As regards his marriage to Pythia, [Aristotle] himself has given a sufficient defense in the letters to Antipater. For when Hermias died, he married her on account of goodwill toward him: she was, at all events, temperate and good, but had bad luck because of the disasters that befell her brother.

F234 *R664A Plutarch,* On Tranquility of Mind *472E–F*

Aristotle, writing to Antipater, says: "It is not only fitting for Alexander to be proud because he rules over many people, but it is no less fitting for those who hold about the gods the beliefs they should."

F235 *R665 Demetrius,* On Style *225*

Who would speak to a friend in the way that Aristotle, when he is writing to Antipater on behalf of an aged exile? He says: "If this man goes as an exile to every land so as never to return, it is clear that there can certainly be no reproach for those who wish to descend to Hades." For someone speaking in this way is more like someone showing off than someone just chatting.

F236 *R666 Aelian,* Varia Historia *14.1*

Aristotle, son of Nicomachus, . . . when someone took away the honors voted for him at Delphi, wrote a letter to Antipater about this. He said: "As regards the honors voted for me at Delphi that have been taken away, my present stance is that neither they concern me greatly nor do they not concern me at all."

F237 *R667 Vita Aristotelis Marciana 184–191 (Gigon)*

When the Athenians rose up against him, [Aristotle] escaped to Chalcis, suggesting as an explanation, "I will not permit Athens to err twice against philosophy." But since the duties are not the same for a citizen and for a foreigner in the city of Athens, in his letter

to Antipater he writes: "It is difficult to spend time in Athens. For the pear ripens on the pear tree, the fig (*sukon*) on the fig tree,"[75] hinting at the succession of sycophants.

F238 *R668 Demetrius,* On Style *144*

Grace comes about from everyday words, as when Aristotle says, "The more of a loner I am, the more a lover of stories I become," and from neologisms, as when he says in the same passage, "The more I am a selfer and a loner, the more a lover of stories I become." For while "loner" is a term of a rather everyday character, "selfer" is a neologism of his own.

F239 *R669A Demetrius,* On Style *29*

However, similarities of endings can sometimes be useful, as when Aristotle says: "I came from Athens to Stagira because of a king so great, from Stagira to Athens because of a winter so great."

F240 *R670 Demetrius,* On Style *230–231*

Aristotle, who seems to have succeeded most of all with the style suited to letters, says: "I do not write this to you, for it is not suited to letters." For if someone were to write sophisms or natural science in a letter, while he would be writing, he would nonetheless not be writing a letter. For a letter professes to be courteous, concise, setting out a simple subject matter in simple words.

10. Poems

F241 *R673 Olympiodorus, On Plato's* Gorgias *41.9.13–26*

That Aristotle revered [Plato] as his teacher is clear from the fact that he wrote an entire encomium [to him]. . . . But not only did he praise him by composing an encomium, but also in the elegy for Eudemus, while complimenting the latter he also praises Plato, writing as follows:

> Entering the famous land of Cecropia
> He piously dedicated an altar to holy friendship
> For a man whom it is not right for bad men even to praise.
> A man, who alone, or first among mortals brilliantly displayed
> By his own life as well as by his methods of argument
> That it is at the same time that a man becomes good and happy.
> But now no one can grasp this anymore.

75. *Odyssey* 7.120–121.

F242 *R675 Diogenes Laertius 5.7–8 = Athenaeus 696B–E, Didymus,* On Demosthenes *col. 6 (Page)*

O virtue, much labored for by mortal kind,
The noblest spoil in life,
For your beautiful shape, maiden,
Even to die is an enviable fate in Greece,
And to suffer pains, raging and unceasing.
Such is what you cast into a heart,
An undying fruit, greater than gold,
Than ancestors, than soft-glittering sleep.

For your sake Zeus' Heracles and Leda's sons
Endured much in their deeds
Hunting after your power;
In longing for you Achilles and Ajax entered the house of Hades;
For the sake of your dear form, Atarneus' nursling[76]
Forsook the rays of the sun.

That is surely why he will be sung of for his deeds
And why the Muses will exalt him into immortality,
The daughters of Memory, exalting the awe of Zeus, god of guest-friends and
The last honors of steady friendship.

11. Will

F243 **Diogenes Laertius 5.11–16 (Dorandi)*

May all be well; but if anything should happen, Aristotle has made the following provisions:

Antipater is to be the executor of all matters and in perpetuity. |**12**| Until Nicanor arrives, Aristomenes, Timarchus, Hipparchus, Dioteles, and Theophrastus (if he wishes to and is able) are to take care of the children, Herpyllis, and the property.

When my daughter comes of age, she is to be given in marriage to Nicanor. But if anything should happen to her before marrying (may it not, nor will it) or when she has married but has not yet had children, Nicanor is to have full authority in matters concerning the boy[77] and concerning all other matters, to manage in a manner worthy of himself and of us. Nicanor is also to take care of both my daughter[78] and my son Nicomachus in whatever way he thinks worthy for them, as if he were their father or brother.

76. I.e., Hermias. See F223.
77. I.e., Nicomachus.
78. Whom other sources say was called "Pythias," like her mother.

If anything should happen to Nicanor beforehand (may it not), either before taking the girl in marriage or after he has taken her but before there are children, let whatever provisions he may have made be valid. If Theophrastus wishes to be with the girl, it is to be just as with Nicanor. |**13**| If not, the executors, in consultation with Antipater, are to manage the affairs of the girl and the boy as seems best to them.

The executors and Nicanor, in memory of me and of Herpyllis, because she was devoted to me, are to take care of all other matters related to her, and, if she wishes to take another husband, they are to see to it that she is not given to anyone unworthy of us. In addition to what was given to her before, they are to give her a talent of silver from the estate and three female slaves, whichever ones she wishes, as well as the maid she presently has, and the slave from Pyrrha. |**14**| If she wishes to live in Chalcis, she may have the guesthouse by the garden, if in Stagira, my father's house. Whichever of these she wishes, the executors are to make those preparations that seem best to them and sufficient to Herpyllis.

Nicanor is also to take care of the young boy Murmex,[79] so that he is conveyed in a way worthy of us to his own relatives, with those belongings of his which we received. Ambarkis is to be freed and given, when my daughter marries, five hundred drachmas and the young female slave she has. Thale, in addition to the maid she has (the one who was bought), is to be given a thousand drachmas and a maid. |**15**| And for Simon, apart from the money given to him previously for the slave, either another slave is to be bought or additional money is to be given to him. Tacho is to be freed, when my daughter marries, as well as Philon, Olympius, and his child. Do not sell any of the slaves who served me, but continue to employ them. And when they come of age, set them free if they deserve it.

The executors are to take care too that the busts commissioned from Gryllion are set up when they are finished: that of Nicanor, that of Proxenus (which I had in mind to commission), and that of Nicanor's mother; that of Arimnestus, already completed, they are to set up as a memorial to him, since he died childless; |**16**| that of my mother they are to consecrate to Demeter at Nemea, or wherever seems appropriate. Wherever they make my grave, there they are to collect and place the bones of Pythia, as she herself instructed. Upon Nicanor's safe return, in fulfillment of the prayer I have offered on his behalf, they are to set up in Stagira stone statues, four cubits high, to Zeus the Savior and to Athena the Savior.

79. Otherwise unknown. The rest are apparently Aristotle's slaves.

CATALOGS OF ARISTOTLE'S WRITINGS

*Diogenes Laertius 5.22–27**

[Aristotle] wrote an altogether enormous number of books, which I have thought it appropriate to append because of the man's excellence as regards all his accounts:—

1. *On Justice*, 4 books **|22|**
2. *On Poets*, 3 books
3. *On Philosophy*, 3 books
4. *On the Politician*, 2 books
5. *On Rhetoric*, or *Grylus*, 1 book
6. *Nerinthus*, 1 book
7. *Sophist*, 1 book
8. *Menexenus*, 1 book
9. *On Love*, 1 book
10. *Symposium*, 1 book
11. *On Wealth*, 1 book
12. *Protrepticus*, 1 book
13. *On the Soul*, 1 book
14. *On Prayer*, 1 book
15. *On Good Breeding*, 1 book
16. *On Pleasure*, 1 book
17. *Alexander*, or *In Defense of Colonists*, 1 book
18. *On Kingship*, 1 book
19. *On Education*, 1 book
20. *On the Good*, 3 books
21. *Excerpts from Plato's* Laws, 3 books
22. *Excerpts from Plato's* Republic, 2 books
23. *Economics*, 1 book
24. *On Friendship*, 1 book
25. *On Being Affected or Having Been Affected*, 1 book
26. *On Sciences*, 1 book
27. *On Contentious Arguments*, 2 books
28. *Resolutions of Contentious Arguments*, 4 books
29. *Sophistical Divisions*, 4 books
30. *On Contraries*, 1 book
31. *On Forms and Kinds*, 1 book

* Translated by C. D. C. Reeve. Text: T. Dorandi, *Diogenes Laertius: Lives of Eminent Philosophers* (Cambridge, 2013).

32. *On [Platonic] Forms*, 1 book
33. *Notes on Dialectical Arguments*, 3 books **|23|**
34. *Propositions on Virtue*, 3 books
35. *Objections*, 1 book
36. *On What Is Said of Things in Many Ways or By Addition*, 1 book
37. *On Feelings* or *On Anger*, 1 book
38. *Ethics*, 5 books
39. *On Elements*, 3 books
40. *On Scientific Knowledge*, 1 book
41. *On Starting-Point*, 1 book
42. *Divisions*, 17 books
43. *Division*, 1 book[1]
44. *On Question and Answer*, 2 books
45. *Propositions on Movement*, 1 book
46. *Contentious Propositions*, 1 book
47. *Deductions*, 1 book
48. *Prior Analytics*, 9 books
49. *Great Posterior Analytics*, 2 books
50. *On Problems*, 1 book
51. *Methodics*, 8 books
52. *On the Better*, 1 book
53. *On the Form*, 1 book
54. *Definitions Pre-Topics*, 1 book
55. *Topics*, 7 books
56. *Deductions*, 2 books
57. *Deduction and Definitions*, 1 book
58. *On the Desirable and the Coincidental*, 1 book |**24**|
59. *The Pre-Topics*, 1 book
60. *Topics against Definitions*, 2 books
61. *Affections*, 1 book
62. *Division*, 1 book
63. *Mathematics*, 1 book
64. *Definitions*, 13 books
65. *Dialectical Deductions*, 2 books
66. *Propositions on Pleasure*, 1 book
67. *On the Voluntary*, 1 book
68. *On the Noble*, 1 book
69. *Theses for Dialectical Deductions*, 25 books
70. *Theses on Love*, 4 books
71. *Theses on Friendship*, 2 books
72. *Theses on the Soul*, 1 book
73. *Politics*, 2 books
74. *Lectures on Politics* (like those of Theophrastus), 8 books

1. In 42, the title is *diairesis*, which refers to the process of division; in 43 it is *diairetikon*, which refers to each of the divisions resulting from that process.

75. *On Just Actions*, 2 books
76. *Collection of Crafts*, 2 books
77. *Craft of Rhetoric*, 2 books
78. *Craft*, 1 book
79. *Craft* (another work), 2 books
80. *Methodics*, 1 book
81. *Collection of the "Craft" of Theodectes*, 1 book
82. *Study on the Craft of Poetry*, 2 books
83. *Rhetorical Enthymemes*, 1 book
84. *On Magnitude*, 1 book
85. *Divisions of Enthymemes*, 1 book
86. *On Style*, 2 books
87. *On Advice*, 1 book |**25**|
88. *Collection*, 2 books
89. *On Nature*, 3 books
90. *Nature*, 1 book
91. *On the Philosophy of Archytas*, 3 books
92. *On the Philosophy of Speusippus and Xenocrates*, 1 book
93. *Excerpts from the Timaeus and from the Works of Archytas*, 1 book
94. *Against the Doctrines of Melissus*, 1 book
95. *Against the Doctrines of Alcmaeon*, 1 book
96. *Against the Pythagoreans*, 1 book
97. *Against the Doctrines of Gorgias*, 1 book
98. *Against the Doctrines of Xenophanes*, 1 book
99. *Against the Doctrines of Zeno*, 1 book
100. *On the Pythagoreans*, 1 book
101. *On Animals*, 9 books
102. *Dissections*, 7 books
103. *Selection of Dissections*, 1 book
104. *On Compound Animals*, 1 book
105. *On Mythological Animals*, 1 book
106. *On Sterility*, 1 book
107. *On Plants*, 2 books
108. *Physiognomics*, 1 book
109. *Medicine*, 2 books
110. *On the Unit*, 1 book
111. *Signs of Storms*, 1 book
112. *Astronomy*, 1 book |**26**|
113. *Optics*, 1 book
114. *On Movement*, 1 book
115. *On Music*, 1 book
116. *Memory*, 1 book
117. *Homeric Problems*, 6 books
118. *Poetics*, 1 book
119. *Physics* (alphabetically ordered), 38 books

120. *Problems*, 2 books
121. *Problems in Circulation*, 2 books
122. *Mechanics*, 1 book
123. *Problems from Democritus*, 2 books
124. *On the Magnet*, 1 book
125. *Conjunctions of Stars*, 1 book
126. *Miscellaneous*, 12 books
127. *Examinations Arranged by Kind*, 14 books
128. *Claims*, 1 book
129. *Olympic Victors*, 1 book
130. *Pythian Victors in Music*, 1 book
131. *On Pytho*, 1 book
132. *Pythian Victors*, 1 book
133. *Victories at the Dionysia*, 1 book
134. *On Tragedies*, 1 book
135. *Catalogs of Dramas*, 1 book
136. *Proverbs*, 1 book
137. *Rules for Communal Messes*, 1 book
138. *Laws*, 4 books
139. *Categories*, 1 book
140. *On Interpretation*, 1 book
141. *Constitutions of 158 Cities* (arranged by form: democratic, oligarchical, aristocratic, and tyrannical) |**27**|
142. *Letters to Philip about the Selymbrians*[2]
143. *Letters to Alexander*, 4 books
144. *Letters to Antipater*, 9 books
145. *To Mentor*, 1 book
146. *To Ariston*, 1 book
147. *To Olympias*,[3] 1 book
148. *To Hephaestion*,[4] 1 book
149. *To Themistagoras*, 1 book
150. *To Philoxenus*, 1 book
151. *To Democritus*,[5] 1 book
152. An epic poem beginning "Holy Far-Shooter,[6] most revered of the gods . . ."
153. An elegy beginning "Daughter of a mother of beautiful children . . ."

2. Inhabitants of the Thracian city of Selymbria.
3. Mother of Alexander the Great.
4. Close comrade of Alexander the Great.
5. A contemporary of Aristotle; not the atomist philosopher of the same name.
6. Apollo.

Hesychius[7]

1. *On Justice*, 4 books (DL1)
2. *On Poets*, 3 books (DL2)
3. *On Philosophy*, 4 books (DL3)
4. *On the Politician*, 1 book (DL4)
5. *On Politics* or *Grylus*,[8] 3 books (DL5)
6. *Nerinthus*, 1 book (DL6)
7. *On Wealth*, 1 book (DL11)
8. *Sophist*, 1 book (DL7)
9. *On Prayer* (DL14)
10. *Menexenus*, 1 book (DL8)
11. *On Good Breeding*, 1 book (DL15)
12. *On Love*, 1 book (DL9)
13. *On the Soul*, 1 book (DL13)
14. *Protrepticus*, 1 book (DL12)
15. *On Pleasure*, 1 book (DL16)
16. *On Kingship*, 1 book (DL18)
17. *Economics*, 1 book (DL23)
18. *On Education* or *Concerning Education*, 1 book (DL19)
19. *Deductions*, 1 book (DL47)
20. *On the Good*, 1 book (DL20)
21. *On Starting-Points* or *On Nature*, 1 book (DL41)
22. *Alexander* or *In Defense of Colonies*, 1 book (DL17)
23. *Excerpts from Plato's* Laws, 2 books (DL21)
24. *On Friendship*, 3 books (DL24)
25. *On Sciences*, 1 book (DL26)
26. *On Being Affected or Having Been Affected* (DL25)
27. *On Contentious Arguments*, 2 books (DL27)
28. *On Forms*, 1 book (DL31)
29. *Resolutions of Contentious Arguments*, 4 books (DL28)
30. *On the Feeling of Anger*, 1 book (DL37)
31. *Sophistical Divisions*, 1 book (DL29)
32. *On Contraries*, 1 book (DL30)
33. *Notes on Dialectical Arguments*, 3 books (DL33)
34. *Propositions on Virtue*, 2 books (DL34)
35. *On Elements*, 3 books (DL39)
36. *Objections* (D35)
37. *On Things Said in Many Ways or by Addition*, 1 book (DL36)
38. *Propositions*, 1 book
39. *Ethics*, 20 books (DL38)

7. Text: T. Dorandi, "La *Vita Hesychii* d'Aristote," *Studi Classici e Orientali* 52 (2006): 87–106. The titles of the treatises and the number of books assigned to them do not always exactly correspond to their correlates in Diogenes Laertius (DL).
8. Probably a mistake for *On Rhetoric, or Grylus*.

40. *On Movement*, 1 book[9]
41. *On Divisions*, 17 books (DL42)
42. *Divisions*, 1 book (DL43)
43. *On Question and Answer*, 1 book (DL44)
44. *Contentious Propositions*, 1 book (DL46)
45. *On the Form*, 1 book (DL53)
46. *Prior Analytics*, 9 books (DL48)
47. *Posterior Analytics*, 2 books (DL49)
48. *On Problems* (DL50)
49. *Methodics* (DL51)
50. *On the Better*, 1 book (DL52)
51. *Definitions*, 1 book (DL54)
52. *Topics*, 7 books (DL55)
53. *Mathematics*, 1 book (DL63)
54. *Deductions*, 2 books (DL56)
55. *Deductive Definitions*, 1 book (DL57)
56. *On the Choosable and the Coincidental*, 1 book (DL58)
57. *The Pre-Topics*, 1 book (DL59)
58. *On Voluntary Actions*, 1 book (DL67)
59. *Topics against Definitions*, 6 books (DL60)
60. *Affections*, 1 book (DL61)
61. *Definitions*, 13 books (DL64)
62. *Dialectical Deductions*, 2 books (DL65)
63. *On the Noble*, 1 book (DL68)
64. *On Just Actions*, 2 books (DL75)
65. *Theses for Dialectical Deductions*, 25 books (DL69)
66. *Theses on Love*, 4 books (DL70)
67. *Theses on Friendship*, 2 books (DL71)
68. *Theses on the Soul*, 1 book (DL72)
69. *Theses on Politics*, 2 books (DL73)
70. *Lectures on Politics*, 8 books (DL74)
71. *Collection of Crafts*, 1 book (DL76)
72. *Craft of Rhetoric*, 3 books (DL77)
73. *Craft*, 1 book (DL79)
74. *Collection of the "Craft" of Theodectes in 3 books* (DL81)
75. *Craft of Poetry*, 2 books (DL82)
76. *Rhetorical Enthymemes*, 1 book (DL83)
77. *On Magnitude*, 1 book (DL84)
78. *Divisions of Enthymemes* (DL85)
79. *On Pure Style*, 1 book (DL86)
80. *On Advice*, 1 book (DL87)
81. *On Nature*, 1 book (DL89)
82. *Nature*, 1 book (DL90)

9. 38 and 40 may correspond to DL45, DL46.

83. *On the Philosophy of Archytas*, 1 book (DL91)
84. *On the Philosophy of Speusippus and Xenocrates*, 1 book (DL92)
85. *Excerpts from the Timaeus and from Archytas*, 1 book (DL93)
86. *Against the Doctrines of Melissus*, 1 book (DL94)
87. *Against the Doctrines of Alcmaeon*, 1 book (DL95)
88. *Against the Pythagoreans*, 1 book (DL96)
89. *Against the Doctrines of Gorgias*, 1 book (DL97)
90. *On Sterility*, 1 book (DL106)
91. *On Animals*, 9 books (DL101)
92. *On Compound Animals*, 1 book (DL104)
93. *On Dissections*, 6 books (DL102)
94. *Selection of These (Dissections)*, 1 book (DL103)
95. *On Mythological Animals*, 1 book (DL105)
96. *On Plants*, 2 books (DL107)
97. *Physiognomics*, 2 books (DL108)
98. *On Medicine*, 2 books (DL109)
99. *Signs of Storms*, 1 book (DL111)
100. *On the Unit*, 1 book (DL110)
101. *Astronomy*, 1 book (DL112)
102. *On Movement*, 1 book (DL114)
103. *Optics*, 1 book (DL113)
104. *On Music*, 1 book (DL115)
105. *Peplos*[10]
106. *Homeric Problems*, 6 books (DL118)
107. *Hesiodic Questions*,[11] 1 book
108. *Poetics*, 1 book (DL118)
109. *On Memory*, 1 book (DL116)
110. *Physics*, 38 books (alphabetical ordered) (DL119)
111. *Metaphysics*, 20 books
112. *Examined Problems* (DL120)
113. *Problems in Circulation*, 2 books (DL121)
114. *Mechanics*, 1 book (DL122)
115. *Cycle on Poets*, 3 books
116. *Democritean Problems*, 2 books (DL123)
117. *On the Magnet*, 1 book (DL124)
118. *Conjunctions of Stars*, 1 book (DL125)
119. *Miscellaneous Matters*, 12 books (D126)
120. *Claims of Cities*, 1 book (DL128)
121. *Examinations Arranged by Kind*, 14 books (DL127)
122. *Olympic Victors*, 1 book (DL129)
123. *Pythian Victors*, 1 book, with which he defeated Menaechmus[12] (DL133?)
124. *On Music*, 1 book (DL130?)

10. Prose narratives about Greek heroes with their epitaphs.
11. Reading Ἡσιοδείων.
12. Of Sicyon (4th cent BC), Greek historian who focused on Alexander the Great.

125. *Sophistical Refutations*, or *On Contentious Arguments*
126. *Victors of the City Dionysia and Lenaia* (DL133)
127. *On Proverbs*,[13] 1 book (DL136)
128. *On Tragedies*, 1 book (DL134)
129. *Catalogs of Dramas*, 1 book (DL135)
130. *Rules for Gathering People*, 1 book (DL137?)
131. *Customs*, 4 books (DL138?)
132. *Categories*, 1 book (DL139)
133. *On Interpretation* (DL140)
134. *Prior Analytics*, 2 books
135. *Constitutions of 158 Cities* (arranged by form:[14] democratic, oligarchical, aristocratic, and tyrannical) (DL142)
136. *Problems Concerning Communal Messes*, 3 books
137. *Letters*, 20 books (DL142–151)
138. An epic poem, beginning: "Holy one, most revered of the gods, far-shooting . . ." (DL152)
139. An elegy beginning: "Daughter of a mother of beautiful offspring . . ." (DL153)
140. *On the Wooden Tablets of Solon*, 5 books
141. *On Blessedness* or *Why Did Homer Invent the Cattle of the Sun?*
142. *Questions on Hesiod*, 1 book
143. *Questions on Archilochus, Euripides, and Choerilus*, in 3 books
144. *Poetical Questions*, 1 book
145. *Poetical Explanations*
146. *Homeric Problems*, 10 books
147. *Lectures on Physics*, 18 books
148. *On Coming to Be and Passing Away*, 2 books
149. *On Meteors*, 4 books, or *Meteorology*
150. *On the Heavens*, 1 book[15]
151. *On the Soul*
152. *On Rhetoric*
153. *Metaphysics*
154. *On the History of Animals*, 10 books
155. *On the Movement of Animals*, 3 books
156. *On the Parts of Animals*, 3 books
157. *On the Generation of Animals*, 3 books
158. *On the Rising of the Nile*
159. *On Substance in Mathematics*
160. *On the Communal Mess* or *On Symposia*
161. *On Reputation*
162. *On Virtue*
163. *On Voice*

13. Reading παροιμιῶν.
14. Reading κατ' ἰδίαν.
15. Reading Περὶ οὐρανοῦ δ'.

164. *On the Married Life of Husband and Wife*
165. *Rules for Husband and Wife*
166. *On Medicine*, 7 books
167. *Miscellaneous Scientific Researches, as presented by Eukairos,*[16] *his disciple*
168. *Peplos* (it comprises miscellaneous inquiries)
169. *On Time*
170. *On Kingship*
171. *On Education*
172. *On Vision*, 2 books
173. *On the Nicomachean Ethics*
174. *Recommendations*
175. *To Alexander* or *On the Orator or the Statesman*
176. *On the Craft of Eulogy*
177. *On Marvelous Things Heard*
178. *Eulogies* or *Hymns*
179. *On Differences*
180. *On Love*, 6 books
181. *On Good Breeding*, 1 book
182. *On Human Nature*
183. *On the Generation of the Cosmos*
184. *Customs of the Romans*
185. *Collection of Foreign Customs*

And the following spurious works:

186. *Human Anatomy*
187. *Defense of Impiety against Eurymedon*
188. *Agricultural Matters*
189. *Eulogy of Discourse*
190. *Magicus*
191. *On Temperance*
192. *Adverse Criticism of Alexander*
193. *Eulogy of Wealth*
194. *To Alexander*
195. *On Method*

16. Otherwise unknown.

Ptolemy-el-Garib[17]

1. *Exhortation to Philosophy* (*Protrepticus*) 3 books (DL12)
2. *Sophist*, 1 book (DL7)
3. *On the Craft of Rhetoric*, 3 books (DL5)
4. *On Justice*, 4 books (DL1)
5. *On the Exercise and Education That Are Useful for the States of the Human Soul* (*On Education*), 4 books (DL19)
6. *On Good Breeding*, 5 books (DL15)
7. *On the Poets*, 3 books (DL2)
8. *On Kingship*, 6 books (DL18)
9. *On the Good*, 5 books (DL20)
10. *Archytas*, 3 books
11. *On Indivisible Lines*, 3 books
12. *On the Attribute of Justice* (*On Just Actions*), 4 books (DL75)
13. *On Distinctness and Difference* (*On Difference*), 2 books
14. *On the Subject of Love*, 4 books (DL9, 70)
15. *On the Forms, Whether They Exist or Not* (*On the Forms*), 3 books (DL32)
16. *A Compendium of Plato's Views on Laws*, 2 books (DL21)
17. *A Compendium of Plato's Views on the Administration of Cities* (Republic), 5 books (DL22)
18. *A Compendium of Plato's Views on Pleasure . . .*
19. . . . *in His* Republic (2 books)
20. *On Pleasure*, 2 books (DL16)
21. *On Movements*, 8 books (DL114)
22. *On Ingenious Questions* (*Mechanics*), 2 books (DL122)
23. *On the Craft of Poetry According to the School of Pythagoras and His Companions*, 2 books
24. *On Breath*, 3 books
25. *Problems*, 3 books (DL120)
26. *On the Nile of Egypt*, 3 books
27. *On How Animals Get Places to Hide or Nest* (*On Going into Hiding*),1 book *A Catalog of Crafts,* 1 book
28. *On Love*, 3 books (DL9, 70)
29. *Categories*, 1 book (DL139)
30. *On Interpretation*, 1 book (DL140)
31. *Analytics*, 8 books (DL48)
32. *Topics*, 2 books (DL55)
33. *Demonstrations* (= *Posterior Analytics*), 2 books (DL49)

17. Translated (from the French) by Pavlos Kontos. Text (Arabic with French translation): Marwan Rashed, *Ptolémée "Al-Gharîb," Épître* à *Gallus sur la Vie, le Testament et les Écrits d'Aristote* (Paris, 2021). The translation employs the numbering of Ptolémée, *Ad Gallum*, in which not all entries have a separate number, but draws also on the other two versions of the catalog that Rashed prints, especially that of Ibn al-Qifti, which often includes the Greek title of the treatise listed. Correlations with DL are sometimes approximate.

34. *On the Sophists* (= *Sophistical Refutations*), 1 book
35. *Great Treatise on Ethics* (= *Magna Moralia*), 2 books
36. *Small Treatise on Ethics, written for Eudemus* (= *Eudemian Ethics*), 8 books
37. *On the Administration of Cities* (= *Politics*), 8 books (DL74)
38. *On the Craft of Poetry*, 2 books (DL82)
    On the Craft of Rhetoric, 3 books (DL77)
39. *Courses on Physics*, 8 books (DL119)
40. *On the Heavens and the Cosmos*, 4 books
41. *On Coming to Be and Passing Away*, 2 books
42. *Upper Appearances* (= *Meteorology*), 4 books
43. *On the Soul*, 3 books
44. *On Perception and the Perceptible Object*, 1 book
45. *On Memory and Sleep*, 1 book
46. *On the Movement of Animals and Their Anatomy*, 7 books
47. *On the Natures of Animals* (*On the History of Animals*), 10 books
48. *On the Parts by Means of Which There Is Life*, 4 books
49. *On the Generation of Animals*, 5 books
50. *On the Progression of Animals on Earth*, 1 book
51. *On the Length and Shortness of Animal Life*, 1 book
52. *On Life and Death*, 1 book
53. *On Plants*, 2 books
54. *On What There Is After Nature* (*Metaphysics*), 3 books
55. *Questions about Material Things*, 1 book
56. *Questions about Natural Things*, 4 books
57. *On Divisions* (in this book, he mentions the divisions of time, soul, desire, the question of the affecter and the one being affected, the question of friendship, the kinds of the good, and the fact that among them, some are intelligible, some within the soul, and some coming from the soul; he mentions the question of goodness and evil; he mentions the kinds of sciences, the kinds of movements, the kinds of what is the object of discourse, the kinds of existent things and in what they are divided), 26 books (DL42)
58. *On Plato's Divisions*, 6 books
59. *On the Division of Conditions Hypothesized (i.e., Put) in Speeches*, 3 books
60. *On the Contradiction of a Proposition Because of the Fact That the Premises of the One Who Commits the Contradiction Have Been Drawn from the Proposition Itself* (*On Rhetorical Exercises*), 39 books
61. *The Book of Refutations*, 12 books (DL35?)
62. *The Book of Theses*, 34 books (DL69)
63. *Theses on Love*, 1 book (DL70)
64. *Theses on Nature*, 1 book
65. *A Catalog of Theses*, 1 book
66. *Definitions*, 16 books (DL64)
67. *On Defined Things*, 4 books
68. *On Definition for the Topics*, 1 book (DL54)

69. *On Construction of Definitions Used in the Topics*, 3 books
70. *Theses by Means of Which We Construct Definitions*, 2 books
71. *On the Contradiction of Definitions Starting from Definitions*, 2 books
72. *On the Construction of Definitions Starting from Definitions*, 2 books
73. *On the Craft of Definition Used by Theophrastus for the Prior Analytics*, 1 book
74. *On the Construction of Definitions*, 2 books
75. *The Book of Questions*, 69 books
76. *Premises for Questions*, 3 books
77. *Problems in Circulation* (i.e., in the circulars used by learners), 4 books (DL121)
78. *The Book of Instructions*, 4 books
79. *Notes*, 2 books
80. *Questions on Medicine Ordered by Their Form*, 5 books (DL109)
81. *On the Forms of Nourishment*, 1 book
82. *On Agriculture*, 10 books . . .
    . . . of which the treatise *On Wet Things* makes up a part, 1 book
83. *On Dry Things*, 1 book
84. *On General Coincidents*, 3 books
85. *Upper Appearances* (= *Meteorology*), 2 books
86. *On Animal Lineage*, 2 books
87. A book on the same notion relevant to agricultural causes, 2 books
88. *On Premises*, 23 books
89. On the same notion except that it concerns other premises, 7 books
90. *The Constitution of Cities* . . .
91. . . . *in Which He Mentions the Constitutions of Numerous Nations and Cities among the Cities of the Greeks and of Others and Their Lineage (and the Number of Cities and Nations Is 171)* (DL141)
92. *Notes*, 16 books
93. More *Notes*, 1 book
94. *On Contradictions*, 1 book
95. *On the Relative*, 1 book
96. *On Time*, 1 book
97. *On the Laws of the Cities*, 2 books
    and the books found in the library of Apellicon[18]
98. Other *Notes*
99. *One long book with numerous letters*, 8 volumes
100. Letters by Aristotle found by Andronicus, and books by him in which there are notes that have not been divulged, the number and the beginnings of which you will find in the fifteenth treatise of Andronicus' book on the catalog of Aristotle's books), 20 volumes
101. *Questions Relevant to Difficult Notions in Homeric Poetry* (= *Homeric Problems*), 10 volumes (DL117)
102. *A Compendium of Medical Notions*

18. Famous 1st-cent-BC book collector from Teos.

ANNOTATED GLOSSARY OF TERMS*

Abduction (*apagôgê*): *Apagôgê* is defined in *APr*. 2.25 as a process of leading an argument away from one problem to another that is more easily solved. The term is also applied to indirect proof, where a conclusion is reached by deriving an impossibility or falsehood, as in reduction to a contradiction (*reductio ad absurdum*).

Abstraction (*aphairesis*): A process of mentally removing or stripping away affections or attributes (*Ph*. 193^{b}34), in order to study what remains. This happens correctly in mathematics (*Met*. 1061^{a}28–35), and in primary philosophy (1004^{b}10–17), but often incorrectly in natural science (1036^{b}21–32, *PA* 641^{b}10–12).

Acceptable, Reputable (*endoxos*): (1) When applied to a belief or the like, *endoxos* is "acceptable" and its antonyms, (usually) *paradoxos* and (sometimes) *adoxos* (*SE* 173^{a}26), as "unacceptable." (2) When applied to people, qualities, or the like, it is "reputable," as is *eudokimôn*, and its antonyms, *adoxôn* (*Rh*. 1372^{b}22) and (sometimes) *adoxos*, as "disreputable" (1384^{b}31).

Account: See *Logos*

Action (*praxis*)

The noun *praxis* (plural: *praxeis*; verb: *prattein*) is used in a broad sense to refer to any intentional action, including one performed by a child or wild beast; in a narrower one, it refers exclusively to what results from deliberation and deliberate choice, of which neither beasts nor children are capable (*NE* 1111^{a}25–26, ^{b}8–9, *EE* 1224^{a}30–32).

What distinguishes a *praxis* from a *poiêsis* ("production"), with which it is often contrasted, is that the latter is always performed for the sake of some further end, while a *praxis* need not be (*NE* 1139^{a}35–^{b}5). The distinction between a "complete" *praxis* (*Met*. 1048^{b}21–22) and a *poiêsis* is thus a special case of a more general distinction that Aristotle draws at *Met*. 1048^{b}18–35 between an *energeia* ("activity") and a *kinêsis* ("movement").

Expressed linguistically, the contrast is one of aspect rather than tense. Roughly speaking, a verb whose present tense has imperfective meaning designates a *kinêsis*, while one whose present tense has perfective meaning designates an *energeia*. The distinction itself is ontological, however, not linguistic: an *energeia* and a *kinêsis* are sorts of beings, not sorts of verbs. A *poiêsis* or *kinêsis* is something that takes time to complete and—like the time it takes—is indefinitely divisible (*Ph*. 207^{b}21–25, *Met*. 1020^{a}26–32). It has a definite termination point or limit, before which it is

* Prepared by C. D. C. Reeve.

incomplete and after which it cannot continue (*NE* 1174^{a}19–21). An *energeia* does not take time to complete, and so does not really occur "in a temporal interval" (*Ph.* 262^{b}20–21) but is temporally point-like (*NE* 1174^{b}12–13). Having no definite termination, while it may stop, it need never finish (*Met.* 1048^{b}25–27).

The paradigm cases of actions, as we understand them, are temporally extended bodily movements appropriately related to (perhaps by being caused by) beliefs, desires, and intentions. Nonetheless, there is one sort of action that *praxeis* seem to resemble quite closely, namely, so-called basic actions—actions we do directly without having to do anything else. This is especially true, if, as Aristotle himself seems to believe, these are thought to be mental acts of willing, deciding, or trying: "strictly speaking, the ones who above all do actions, even external actions, are the architectonic craftsmen who do them by means of their thoughts" (*Pol.* 1325^{b}21–23). Like *praxeis*, in any case, these sorts of mental actions are not bodily movements and do not seem to take time to perform. Moreover, just as we do not perform basic actions by doing something else first, the same seems true of *praxeis*, so that a human being is "a starting-point or begetter of his *praxeis* as of his children" (*NE* 1113^{b}18–19; also 1139^{b}5). As in the case of productions, where the form in a craftsman's soul is transmitted to the matter via the movements of his hands and instruments (*GA* 730^{b}12–23), so the results of such *praxeis* may be transmitted via bodily movements to other things that are capable of being changed by them. These results, and the bodily movements involved in bringing them about, are what we think of as paradigm actions.

When a group of dramatic actions have a plot-structure (*muthos*) of the sort a good tragedy possesses, Aristotle says that they constitute "one unified action that is whole and complete, having a starting-point, middle points, and end" (*Po.* 1459^{a}19–20). By being enactments of the real-life equivalent of the relevant sort of plot or plan, therefore, the same should also be true of a group of non-dramatic actions. As a group of actors can set out to perform *Oedipus Tyrannus*, so a single agent can set out to enact a unified plan of action, which involves doing many different things in some sort of sequence. The complex action that fits this plan may be what constitutes his acting well—his *eupraxia*.

To understand why the agent is doing any of the things specified by the plan, we will typically need to see it in relation to the plan as a whole. For many of these, taken individually, might not be ends or goods choiceworthy for their own sakes: some might be otherwise valueless means to ends, some might be productions of needed equipment, some might be actions whose status as intrinsically choiceworthy, because constitutive of *eupraxia*, nonetheless depends on their role in the plan. As parts of the whole complex action they help constitute, however, all are intrinsically choiceworthy, since the complex action is itself so. Hence the unified plan itself might be likened to the form of health in the soul of the doctor, which dictates the bodily movements that constitute, for example, producing the uniform state in a tense muscle, which is the relevant defining mark of health (*Met.* 1032^{b}6–10).

The actualization of the plan, the setting of it in motion, is an action, as is the carrying out of the subsequent steps. In performing each of them, the agent is achieving the goal of acting well. For acting well, since it is not an external end, is not something achieved only when the plan is fully executed, as health is produced only when the muscles relax and the patient becomes healthy. At the same time, it does not seem to be an entirely internal end, either, since the plan may fail to be completely carried out. We set the associated plan in motion, which is a basic action, but whether we will succeed in carrying it out fully is in part a matter of luck. If we fail through no fault of our own, we have in one way done what is required of us—we have tried; and that is all that we could do. In another way, though, we have failed, and may now have something more to do, such as try again or make amends of some sort. The possibility of failure of this sort taints complex actions with unleisure, since it means there are usually obstacles or resistances to overcome in order to carry them out. Many—perhaps most—actions are surely complex. They would be unleisured, therefore, and subject to a sort of incompleteness, even if they had no additional external ends.

We might think of a political constitution as a plan for a very complex action, with the citizens, who act in obedience to its laws and so on, as its executors or agents. Similarly, a household, which is part of a city with such a constitution, is also such an executor (*Pol.* 1260^{b}8–20), and its "constitution" is itself a plan of action, which the members of the household put into effect by doing what it prescribes. Even when what it prescribes is a production, rather than an action proper, that production too becomes part of the complex action that is the household in activity.

Action, Doable in, Done in (*prakton*): Verbals ending in *-ton* sometimes have (1) the meaning of a perfect passive participle ("done in action") and sometimes (2) express possibility ("doable in action," or, as at *EE* 1217^{a}36, "achievable by action"). A decree (*psêphisma*) seems to be *prakton* in sense (2), since it is a prescription specific enough to be acted on without further need for deliberation (*NE* 1141^{b}27–28). What it specifies is thus a possibility (a type of action) that many different particular (token) actions might actualize. Particular objects of perception that are *prakton* (1143^{a}32–33, ^{b}4–5), however, seem to be so in sense (1). A similar issue arises in the case of other important verbals, such as *aisthêton* ("perceived," "perceptible"), *epistêton* ("scientifically known," scientifically knowable"), *chôriston* ("separated," "separable"), and *haireton* ("chosen," "choiceworthy").

Activity (*energeia*)

The term *energeia* is an Aristotelian coinage, which is generally "activation" when it is being predicated of something and as "activity" when it is not. The dative or adverbial form *energeia[i]* is "active" or "actively," in order to signal its relation to *energeia*. The etymology of the coinage is unclear, but Aristotle is explicit that it has been extended from movement to other things (*Met.* 1046^{a}1–2, 1047^{a}30–32), and that it is related to another term with an *erg-* root, *ergon* ("work"): "the work is the end, and the activity is

the work, and that is why the name 'activity' is said of things with reference to the work, and extends to the actuality" (1050^{a}21–23).

Entelecheia, which is mostly used as a synonym of *energeia*, but with a slightly different connotation, is also an Aristotelian coinage: *energeia* is action, activity, and movement oriented; *entelecheia*—as the *tel-* suggests—is end (*telos*) or completion (*enteles*) oriented (1021^{b}24–30). Putting all this together: the activation or actualization of X is an activity, which is X active or actual, which is X achieving its end, which—since "the for-the-sake-of-which is the work" (996^{b}7)—is X doing its work, and being actively or actually X, and so being complete.

Aristotle needs to distinguish (1) a dead animal from a live one and (2) a dormant or sleeping live animal from an active or awake one. *Energeia* recommends itself for (2). But how, then, to distinguish the level of activity in (1) that constitutes the mere possession of a soul? Perhaps *entelecheia* is introduced for this purpose: soul is "the first *entelecheia* of a natural body that has life potentially" (*DA* 412^{a}28–^{b}1). But Aristotle also uses *energeia* in defining the soul, which is "substance and *energeia* of a certain sort of body" (*Met*. 1043^{a}35–36). If there is a difference between the two notions, then, beyond their different orientations, it is not clear what exactly it is.

An activation or actualization is always that of an associated potentiality (*dunamis*) or capacity of some subject. In some cases, when the subject is matter, such an actualization is a substance. In others it is an activity of a non-substantial sort—e.g., the actualization of the capacity to see is the activity of seeing. When something can acquire a capacity C, but has not yet acquired it, its acquisition of C is C's "first actualization" (*DA* 412^{a}28–29). When C is then actualized or activated, this is a further stage in its actualization (sometimes referred to as its "second" actualization).

Actuality, Actualization (*entelecheia*): See **Activity**

Acumen (*agchinoia*): "Acumen is a sort of good guesswork" (*NE* 1142^{b}6); in particular the sort that "hits on the middle term in an imperceptible amount of time . . . on seeing the extremes" (*APo.* 89^{b}10–15).

Admit of, Admissible (*endechesthai*, *endechomenon*): See **Possible**

Adoleschia: **Babbling**

Affection, Feeling (*pathos*): The verb *paschein* means "suffer," "undergo," "be affected by," "have things done to one," so that *pathê* are things that one is passive rather than active with respect to. Attributes, as things attributed to or predicated of a subject, are thus affections of it, even if they are not the results of the subject's being affected by anything. The starting-point of all affections is "condensation and rarefaction" (*Ph*. 260^{b}8).

Affirmation (*kataphasis*): (1) When it refers to what is affirmed rather than the affirmation of it, *kataphasis* is usually "positive," and its opposite, *apophasis*, usually "negative," or "negation." (2) Aristotle distinguishes between an affirmation (*kataphasis*) and a phrase (*phasis*) (*Int*. 16^{b}26–31), but sometimes, as at *Int*. 21^{b}21 and *DA* 430^{b}26–27,

he fails to keep the distinction in mind, employing *phasis* when *kataphasis* seems more correct. See **Phrase**

Agathos: **Good**

Agchinoia: **Acumen**

Agelaios: **Herd, Live in a**

Agent (*proxenos*): A *proxenos* like a consul or ambassador, the representative of city X to city Y, a citizen of Y, not of X.

Aggregation (*sugkrisis*): See **Disaggregation**

Agriotês: **Wildness**

Aidoion: **Sex Organ**

Air (*aêr*): (1) "We must understand that of what we call 'air' the part surrounding the earth is, as it were, wet and hot because it is vaporous and contains exhalations from the earth" (*Mete*. 340^{b}24–26). (2) "All earthen vapor has the capacity of coarse-grained air" (*GA* 784^{b}15). See **Breath**

Aischron: See **Noble**

Aisthêma: **Perceptual Affection**

Aisthêsis: **Perception, Perceptual Modality**

Aisthêtêrion: **Perceptual Organ**

Aisthêtikon: **Perceptual Part, Perceptual Capacity**

Aisthêton: **Perceptible Object**

Aisumnêtês: **Dictator**

Aitêma: **Postulate**

Aithêr: **Ether**

Aitia, *Aition*: **Cause**

Akantha: **Spine**

Akmê: **Prime**

Akôn: **Involuntary**

Akrasia: **Self-Control, Lack of**

Akribês: **Exact**

Alêtheia: **Truth**

All (*pan*): **Universe, the**

Alloiôsis: **Alteration**

Alteration (*alloiôsis*): Movement or change in the category of quality. (1) "There is alteration when the underlying subject, which is perceptible, while remaining [the same], changes in its own affections, which are either contraries or intermediates" (*GC* 319^{b}10–12). (2) "Everything that is altered is altered due to perceptibles, and . . . there is alteration only of those things that are said to be intrinsically affected by these" (*Ph.* 245^{b}3–5).

Amesos: **Immediate**

Anagkê, anagkaion: **Necessary**

Analogy (*analogia*): When A is said to be B by analogy, there is a single thing or nature X present in A, which is the ontological correlate of B, and which can be an object of genuine scientific knowledge, even if it lacks a name: (1) "It is impossible to come up with one identical thing that cuttlefish bone, fish-spine, and animal bone should be called; but there will be things that follow these too, just as if there were some single nature of this sort" (*APo*. 98^{a}21–23). (2) "As for the underlying nature, it is scientifically knowable by analogy" (*Ph*. 191^{a}7–8).

Analusis: **Analysis**

Analysis (*analusis*): The formulation of premises or the uncovering of deductive (syllogistic) form in everyday, ordinary-language arguments (*APr*. 1.32–46).

Anamimnêskein: **Remember**

Anatomai: ***Dissections***

Andreia: **Courage**

Anemos: **Wind**

Anger (*orgê*): "Desire, involving pain, for apparent revenge, because of apparent contempt on the part of someone unfitted to treat the person himself, or one of those close to him, with contempt" (*Rh*. 1378^{a}31–33). See **Spirit**

Animal (*zô(i)on*): (1) "The animal is defined by the possession of perception" (*Somn*. 454^{b}24–25). The fishes, birds, and insects are thus included among the animals. (2) "The work of most animals is pretty much nothing other than that of plants, namely, [to generate] seed and fruit" (*GA* 717^{a}21–22). (3) A *zô[i]on* can also be a figure in a picture, which need not be the figure of an animal.

Animals, Kinds of: Aristotle is explicit that "one must from the outset divide the one [kind] into many [differences]" (*PA* 643^{b}23–24) and that "it is necessary for there to be many differences that are not under one division" (644^{a}7–8). At *Met*. 1038^{a}8–18 he is probably simplifying things for the sake of clarity and economy of expression, since the (imaginary) animals in the kind considered there have feet as their only

necessary part, so that the differences of feet alone determine their form. The suggestion (*Pol*. 1290^{b}25–37) that each of the possible ways of combining the differentiated necessary parts is a distinct form needs to be tempered by the fact that not all such combinations need be viable—able to survive in some natural habitat: "there are in fact many forms of nourishment, and that is also why the ways of life of both animals and human beings are many; for it is impossible to live without nourishment, so that differences in nourishment have produced different ways of life among the animals" (*Pol*. 1256^{a}19–22). See **Blend**

Animate (*empsuchon*): Literally, "ensouled." "What is animate . . . seems to differ from what is inanimate most of all in two regards: moving and also perceiving" (*DA* 403^{b}26–27).

Anthrôpos: **Human Being**

Antidosis: **Exchange of Property Trial**

Antikeimenon: **Opposite**

Antiperistasis: **Reciprocal Replacement**

Antistrephein: **Convert**

Anupeuthunos: **Citizen, Uncontested**

Apagôgê: **Abduction**

Apeiron: **Unlimited**

Aphairesis: **Abstraction**

Aphrosunê: **Foolishness**

Apodeixis: See **Science**

Apokrisis: **Secretion**

Apolausis: **Indulgence**

Apophasis: See **Affirmation**

Aporia: **Puzzle**

Appear (*phainesthai*): (1) The verb *phainesthai* when used with a participle endorses what appears to be so and is "it is evident that," "manifestly," or the like, and when used with an infinitive it neither endorses nor rejects what appears to be so is "appears." When it occurs without a participle or an infinitive, it may either endorse or reject. (2) Things that appear so to everyone or to wise people who have investigated them are acceptable beliefs (*endoxa*). (3) The nouns corresponding to *phainesthai* are *phantasia* and *phantasma* ("appearance").

Appear to Be So, Things That (*phainomena*): *Phainomena* are things that appear (often, but not always, to perception) to be true, but that may or may not be true.

Appearance (*phantasia*, *phantasma*): (1) (Perceptual) appearances can remain in the perceptual organ "even when the perceptible objects are gone" (*DA* 425^{b}24–25), and so are the sorts of things that can be retained in memory and function as the contents of the imagination (also *phantasia*). (2) But another sort of appearance is deliberative and occurs only in rational animals (434^{a}5–11).

Appetite (*epithumia*): A desire for what is pleasant and an aversion to what is painful (*DA* 414^{b}5–6, *NE* 1111^{b}16–17, *Rh*. 1370^{a}17–18).

Arbitrator (*diaitêtês*): "The arbitrator looks to what is decent, while the judge looks to the law" (*Rh*. 1374^{b}20–21). See **Decency**

Archê: **Rule, Starting-Point**

Architectonic (*architektonikos*): See **Craft**

Aretê: **Virtue**

Argument: *Logos*

Aristocracy (*aristokratia*): An aristocracy in the strict sense is rule by the truly best (*aristos*) people, who, in Aristotle's view, are those possessed of unconditional virtue of character and practical wisdom. The constitution described in *Pol*. 7–8 is an aristocracy of this sort. Other lesser sorts of aristocracies are discussed in 4.7.

Assembly (*ekklêsia*): The body of adult male citizens had ultimate decision-making power in many constitutions. Its membership and frequency of meetings varied from constitution to constitution.

Asteios: **Elegant**

Astêr: **Star**

Astringent: *Struphnos*

Athanasia: **Immortality**

Athanatizein: **Immortalize**

Athlios: **Wretched**

Atmis: **Vapor**

Atomon: **Individual**

Aulos: **Pipe**

Austêros: **Harsh**

Autarkês: **Self-Sufficient**

Automata (*automata*): Puppets operated by a concealed inner mechanism mentioned at *GA* 734^{b}9–17, 741^{b}9, *Met*. 983^{a}14, and discussed in most detail at *MA* 701^{b}1–32.

Automaton: See **Luck, Spontaneous**

Axiom (*axiôma*): "An immediate deductive starting-point . . . that it is necessary for someone to grasp who is going to learn anything at all, I call an 'axiom'" (*APo*. 72^{a}14–17).

Babbling (*adoleschia*): *Adoleschia*, in its somewhat technical sense, consists in being compelled, typically in a dialectical discussion, to say "the same thing repeatedly" (*SE* 165^{b}16–17). It has this sense at *Top*. 130^{a}34, *SE* 173^{a}31–^{b}16, 181^{b}25–182^{a}6. In a less technical sense, it is associated with lack of perspicuousness (*Rh*. 1406^{a}34, 1414^{a}24).

Banausos: **Unrefined**

Barbarian (*barbaros*): *Barbaros*, which may mean no more than "foreign" or "non-Greek," nonetheless often has negative connotations. (1) "A barbarian and a slave are by nature the same" (*Pol*. 1252^{b}9). (2) "Barbarians are by nature more slavish in their characters than Greeks" (1285^{a}20–21) (3) "The beast-like sort . . . occurs most among barbarians" (*NE* 1145^{a}30–31; also 1149^{a}9–11). (4) Peoples from cold northern European regions are "full of spirit but somewhat deficient in thought and craft knowledge" (*Pol*. 1327^{b}24–25).

Baros: **Weight**

Baru: See **Sharp and Dull**

Base, Bad (*phaulos*): An antonym of *kalos* ("noble") and of *agathos* ("good").

Be, Being (*einai*, *to on*): Our verb "is" has four different senses or meanings: (1) Existential "is": "A is" means "A exists." (2) "Is" of identity: "A is B" means "A is identical to B" or "A is one and the same thing as B." (3) "Is" of predication: "A is B" means "B belongs to A." (4) Veridical "is": "A is" means "A is true." In his account of being in *Met*. 5.7, Aristotle mentions a sort of being that corresponds to (2) and to (4), and, in 5.9 and at 1054^{a}32–^{b}3, he has much to say about identity and sameness, including that "whatever is a being is either distinct or the same" (1054^{b}25). (1) is absent from his discussion, although the distinction between potential and actual being bears on it, and it does seem to play some role in explaining what a primary substance is (*Cat*. 2^{b}6). One reason for this is that being itself is not a kind (*APo*. 92^{b}14) and that a demonstrative science posits the existence of the kind it investigates, and proceeds to investigate it (*APo*. 76^{b}11–22, *Met*. 1064^{a}2–4), so that existence itself escapes the focus of the science. This does not mean, however, that there may not be puzzles to solve before the existence of the posited kind can be taken as established (*Met*. 1026^{a}23–32).

Beast-Like (*thêriôdês*): (1) "Temperance and intemperance are concerned with the sorts of pleasures that the rest of the animals share in as well (which is why they appear slavish and beast-like); these pleasures are touch and taste" (*NE* 1118^{a}23–26). (2) "We also use 'beast-like' as a term of abuse for those who exceed human beings in their vice" (1145^{a}32–33). (3) Applied to non-human animals, it means "savage" (*PA* 663^{a}13).

Beautiful: See **Noble**

Being for, the (*einai* + dative): The being for A = what A is intrinsically = the essence of A (*Met*. 1029^{b}13–16).

Belief (*doxa*): Belief is "no less concerned with eternal [things] and impossible ones than with ones that are up to us" (*NE* 1111^{b}30–33), which are the ones found among the perceptible particulars that we can change through our voluntary actions. At the same time, ("mature") belief presupposes a capacity for rational calculation: "Perceptual imagination . . . also belongs to the other animals, but the deliberative sort exists [only] in the rationally calculative ones. . . . And this is the cause of these animals seeming not to have belief, namely, that they do not have the [imagination] that results from a deduction" (*DA* 434^{a}6–12). Hence the part or capacity of the soul that forms beliefs is the same as the part that calculates or deliberates (*NE* 1140^{b}25–26, 1144^{b}14–15). Unlike calculation and deliberation, however, which are sorts of inquiry, what one believes is "already determined," since belief is "not inquiry but already a sort of affirmation" (1142^{b}11–14). That is why believing is of necessity done either falsely or truly. For it is a form of affirmation, and "to say of what is that it is not, or of what is not that it is, is false, while to say of what is that it is, or of what is not that it is not, is true" (*Met*. 1011^{b}26–28). It is also why believing is not up to us. See **Supposition**

Belief, in Accord with (*kata doxan*): Contrasted with "in accord with truth" and associated in particular with dialectic (*APr.* 1.30, *APo*. 81^{b}18–19).

Beliefs, Acceptable (*endoxa*): "Acceptable beliefs . . . are things that seem so to everyone, to the majority, or to the wise—either to all of them, or to most, or to the best known and most reputable" (*Top*. 100^{b}21–23).

Belong to, Holds (*huparchein*): When B is predicated of A, so that A is correctly said to be B, then (it is true that) B belongs to A. When no subject is specified for B, but B is the case, B holds.

Beyond (*para*): (1) Sometimes *para* (+ accusative) simply means "besides" or "in addition to" or the like (*Ph*. 200^{b}32, 251^{b}25, 259^{a}4, *DA* 414^{b}21, 424^{b}17, *PA* 641^{a}35, *Met*. 1010^{b}36, 1086^{b}31, *NE* 1095^{a}26). (2) When universals are said by Platonists to be "beyond" particulars, in the sense of being ontologically independent of them, Aristotle rejects the view (*APo*. 77^{a}5, 89^{b}19, *Met*. 1033^{b}20, 1038^{b}32). But this is because each universal is also said to be a this something (*Top*. 178^{b}37–179^{a}5). In sense (1), Aristotle agrees that universals are "beyond" particulars (*APo*. 100^{a}7).

Bia: **Force**

Bile (*cholê*): See **Gallbladder**

Bios: **Life**

Blend (*krasis*): The concept of a blend, which is contrasted with that of a mixture (*Top*. 122^{b}30–31), plays an important role in explaining the effects of the environment and climate (another meaning of *krasis*) on the bodies, souls, life expectancy, and classification of animals. (1) "Region differs from region, and water from water, in these respects due to the same causes; for the nourishment and especially the condition of the body become of a certain quality due both to the blend of the surrounding air and of the things that enter in, especially the liquid nourishment" (*GA* 767^{a}28–32). (2) "The places in the sea that are inshore succeed in blending hot and cold well; that is also why, in fishes of [the inshore] sort, the flesh is more firm in composition, while that of the deep-sea fishes is watery and flaccid" (*HA* 598^{a}6–9). (3) "The animals that are very watery are more cowardly; for fear cools. Those, then, that have a blend of this sort in the heart are predisposed to this affection; for water is solidified by cold" (*PA* 650^{b}27–30). (4) "The cause of long life in any sort of animal is its being blended in much the same way as the surrounding air" (*GA* 777^{b}6–7). (5) "Since the animals have been divided into the aquatic and terrestrial in three ways (by taking in air or water, by the blend of their bodies, and third by the sorts of their nourishment), their lives follow along in accord with these divisions; for some animals, [their classification] follows along in accord with the blend and the nourishment and in accord with taking in water or air, while [the classification of] others follows along in virtue of the blend and [what sustains] their lives alone" (*HA* 590^{a}13–18).

Blessed (*makarios*): *Makarios* often just means "happy," but sometimes with the implication of being extremely happy (*NE* 1101^{a}7) or in a condition like that of the gods (1178^{b}25–32).

Blood (*haima*): Blood for Aristotle is exclusively red blood, which "is produced by concoction from serum" (*HA* 521^{a}17–18). It is focally discussed in *HA* 3.19, *PA* 2.1–4. It is usually treated as a uniform part of the blooded animals (*HA* 487^{a}1–3, 511^{b}1–2, *PA* 647^{b}12), but perhaps because—like urine in the bladder—it is found "lying in the heart and in the blood vessels like in a container" (*PA* 650^{b}7–8), rather than being attached to them, it is not strictly speaking a part of them (656^{b}21–22). See **Serum**

Blood Vessel (*phleps*, *phlebion*): The great blood vessel (*HA* 509^{b}34, *GA* 738^{a}10) is the vena cava and the whole venous system; the aorta included the whole arterial system. Both alike nourish the body by being conduits for the blood to all parts of it. The fine vessels are the smallest veins and arteries visible to the naked eye, not the capillaries.

Bloom (*hôra*): Young men, whose beards have not yet begun to grow, have a *hôra,* as perhaps do those in their prime. See **Boy Love**; **Pleasure**

Body (*sôma*): "What is divisible in quantity in one dimension is a line, in two a plane, in all—that is, in three—a body" (*Met*. 1016^{b}27–28). Such a body may be: (1) a geometrical solid (*Cael*. 268^{a}7, *Met*. 1020^{a}14, 1029^{a}13); (2) a perceptible, natural, material body, composed of an element or elements (*Ph*. 187^{a}13, 205^{b}26, *Cael*. 275^{b}5, *Met*. 1017^{b}10, 1028^{b}10, 1042^{a}9); (3) the instrumental body of a living thing, whether plant or animal (*DA* 412^{a}16, ^{b}6, 415^{b}19).

Body, Perceptible: A perceptible body is a tangible body, and "a tangible body is that for which touch is the perceptual modality" (*GC* 329^{b}7–8).

Boiling (*hepsêsis*): "Concoction by wet heat of the indefinite [matter] present in the liquid [in the thing being boiled], but the name is said in the strict sense only of things being cooked by boiling" (*Mete*. 380^{b}13–15).

Bouleusis: **Deliberation**

Bowel (*koilia*): See **Stomach**

Boy Love (*paiderasteia*): *Paiderasteia*—love between an older man (*erastês*) and an adolescent boy (*erômenos*)—was an accepted practice in Classical Athens. Sex was common in such relationships, with the boy playing the passive role. Once the boy reached manhood, however, and his bloom faded (*NE* 1157^{a}8), that had to change. On pain of losing his citizen rights, he could no longer be a passive sexual partner. Instead, he was expected to marry, have children, and become an *erastês* in his turn. Though sexual in nature, the relationship was conceived as primarily educative: by associating with someone who was already a man, a boy learned virtue or excellence and how to be a man himself. Rites of passage in some primitive warrior societies also involve sexual contact between men and boys, and it is sometimes suggested that Greek *paiderasteia* also had its roots in a warrior past.

Brain (*egkephalos*): The brain is an important organ for Aristotle, but its importance is negative rather than positive, since it exists mainly to cool the blood, and is by nature the "the coldest part of the body"(*GA* 783^{b}28–29), largest and wettest in human beings (*HA* 494^{b}28–29, *GA* 784^{a}3–4), bipartite (*PA* 669^{b}21–22), and bloodless (*HA* 514^{a}18).

Breath (*pneuma*)

Despite its manifest importance in the transmission and preservation of form, no focused discussion of breath—the innate (*sumphutos*) variety of which "is present in all [animals] by nature and is not brought in from outside" (*PA* 659^{b}18–19)—occurs in Aristotle's genuine extant works. But by piecing together what he does say, a reasonably clear picture emerges.

The role accorded to breath in animal movement, for example, shows that it transmits movement by being itself in movement: "It is evident that breath is naturally well-disposed to be capable of causing movement and supplying strength. And the works of the movement are pushing and pulling, so that the instrument must be capable of being expanded and contracted. And such is the nature of breath; for since it is

contracted and expanded without force, it is capable of pushing and pulling by force due to the same cause" (*MA* 703^{a}18–23; cf. *PA* 659^{b}17–18). Moreover, because the movements it imparts can be formative, as in the case of those involved in the transmission of form itself, they must be complex and various—able, as geneticists now put it, to *code for* all of an animal's parts.

Since "everything that is in spatial movement moves either with a circular, a rectilinear, or a mixed movement" (*Ph.* 261^{b}28–29), all the complex movements breath can produce must be some such combination. What makes this possible is that by actively expanding and contracting, and so pushing and pulling, it can cause not just rectilinear but also circular movements: "rotating is a compound of pulling and pushing; for what is rotating a thing is pulling one part of it and pushing another; for it leads one part away from itself and another part toward itself" (244^{a}2–4). Hence all movements can be caused by breath (*DA* 433^{b}25–26).

Though breath is assigned a role in the transmission of form to uncontroversially animate beings, it is also used to explain other phenomena, such as transparency: "it is not insofar as something is water or insofar as it is air that it is transparent, but because there is a certain nature in it that is the same in both of them and in the eternal body above" (*DA* 418^{b}7–9; also *Sens.* 439^{a}21–25). Then, because breath is involved in soul transmission, soul is to some extent itself attributed to anything in which breath is present.

When "the capacity of all soul" is associated with "the nature in the breath, which is an analog of the element belonging to the stars" (*GA* 736^{b}37–737^{a}1), the point of analogy is that the nature in question is both transparent and—when combined with other elements, whose movements are rectilinear—an appropriate transmitter of soul, form, and life. For the element that belongs to the stars, which is *ether*, or primary body (*sôma prôton*), is a body "beyond the ones composed here, more divine and prior to all these" (*Cael.* 269^{a}32), and is both transparent and in eternal circular movement (270^{a}12–^{b}25). Hence breath is a "body more divine than the so-called elements" (*GA* 736^{b}31), because it is an analog of ether, which is in fact more divine than they.

Focusing now on breath, let us see how best to understand it. One thing we know is that, by being expanded and contracted, it is capable of "pushing and pulling" (*MA* 703^{a}20), but another is that it is "hot air" (*GA* 736^{a}1). Putting the two together we have air increasing in size and contracting due to heat. And this heat is primarily a factor to be understood in terms of its natural upward movement. For breath is not a new element, but rather a construction from old ones introduced to explain the existence in the sublunary world of the circular movements crucial for the transmission and preservation of forms, and so for the coming to be and passing away of the matter-form compounds whose forms they are. But it is equally central to the explanation of animal movement, perception, and thought (*MA* 701^{b}1–32). Form of every variety, one might *almost* say, just is a sort of movement. See **Form, Transmission of**

Breeding, Good (*eugeneia*): (1) "Good breeding is in accord with the virtue of the stock, while being true to one's stock (*gennaion*) is in accord with not being a degeneration from nature" (*Rh*. 1390^{b}22–23). (2) "An animal is well-bred if it comes from good stock; it is true to its stock in not being a degeneration from its own nature" (*HA* 488^{b}18–20). See *Rh*. 1360^{b}31–38, F126–127.

Bregma (*bregma*): The bone that finally grows over the anterior fontanelle.

Buffoon (*bômolochos*): Discussed at *NE* 1128^{a}4–35.

Capacity (*dunamis*): (1) A *dunamis* is a capacity, power, or potentiality something has that makes it possible (*dunatos, endechesthai*) for it, e.g., to cause movement in something else or to be caused to move by something else. It is discussed in *Met*. 5.12. (2) Such a capacity may be either rational or irrational (*Met*. 9.2). (3) In a sense related to (1), a *dunamis* may also be a thing that contributes to the exercise of a capacity or power: "Capacities . . . are things that the excellent person has the capacity to use well, the base person badly" (†*MM* 1183^{b}27–30). (4) Crafts and sciences are often lumped together with capacities as things that can be used to achieve opposite effects, as medicine can be used to cure but also to kill (*NE* 1129^{a}13–14). Sometimes, though, a body of knowledge is classified as a capacity rather than a science, because it is not confined to a single kind (*Rh*. 1359^{b}12–16). (5) In some contexts, a *dunamis* is a force of some sort, as in our "armed forces" (*Pol*. 1321^{a}14). See also **Activity**

Category (*katêgoria*): The term *katêgoria* comes from the verb *katêgorein*, which means "predicate." When B is predicated of A, B falls into some category, depending on what sort of thing B is: "These are ten in number: what-it-is, quantity, quality, relative, when, where, position, having, doing, and being affected. For the coincidents, the kind, the special affections, and the definition will always be in one of these categories" (*Top*. 103^{b}21–25). For each of the intrinsic beings in these ten categories we can specify its what-it-is (*Met*. 1030^{a}17–25), even if, strictly speaking, only substances have definitions and essences (1031^{a}7–14). A category itself is quite often referred to as a kind (*Cat*. 11^{a}38, ^{b}15, *Ph*. 189^{a}14, *Met*. 1070^{b}20, 1089^{b}28).

Catharsis: See **Purgation**

Cause (*aitia, aition*): The four sorts of causes Aristotle recognizes are the final, the formal, the efficient (or moving cause), and the material (*APo*. 94^{a}21–24, *Ph*. 194^{b}23–195^{a}3, *Met*. 983^{a}26–32). The first two, or the first three, are sometimes identical (*Ph*. 198^{a}24–27). Though *Met*. 1013^{a}17 states that "all causes are starting-points," sometimes a starting-point is "primary among the causes" (*GC* 324^{a}27–28). *Met*. 1003^{b}23–24 states the more typical view that starting-point and cause follow along with each other.

Champion, Sponsor (*prostatês*): Usually a leader of the people (*dêmos*) who championed their cause (*Pol*.1305^{a}20, ^{b}17, *Ath*. 2.2, 13.4, 21.1, 23.3, 25.1), but also a "sponsor" of

resident aliens (*Pol.* 1275^{a}13, *Ath* 58.3), who could represent them in, e.g., legal proceedings, which were closed to non-citizens.

Chance (*to automaton*): See **Luck**

Change (*metabolê*): "There are three sorts of change: that from an underlying subject to an underlying subject; that from an underlying subject to what is not an underlying subject; and that from what is not an underlying subject to an underlying subject. For there is no change from what is not an underlying subject to what is not an underlying subject, because there is no opposition; for the terms are not contraries nor is there any contradiction involved" (*Ph.* 225^{a}7–12). See **Movement**

Character (*êthos*): A state formed by habituation (*NE* 1103^{a}17), having to do with feelings and desires, pleasures and pains, which, when in accord with correct reason, is virtuous.

Choice: See **Deliberate Choice**

Choiceworthy (*haireton*): See **Action, Doable in**

Chorêgos: **Patron**

Chorion (*chorion*): The term "chorion" now refers to the exterior envelope of the embryo in mammals, birds, and reptiles. Aristotle, however, seems to use it to refer to what is now called the allantois, a membrane lying below the chorion and forming part of the placenta in certain mammals (*HA* 561^{b}31–562^{a}1).

Chôriston: **Separable**

Chrêmata: **Wealth**

Chumos: **Humor**

Citizen (*politês*): An "unconditional citizen (*politês haplôs*)" is someone who shares in judicial and deliberative office (*Pol.* 3.1–2, 5). But the term "citizen" has a broader application than that. Citizens who share in the constitution are thus contrasted with a larger class of citizens who do not (1332^{a}32–35); kings, unlike tyrants, are said to have fellow citizens as their bodyguards (1285^{a}25–29), again implying that it is possible to be a citizen without sharing in office—since in a kingship only the king is an unconditional citizen; those who share in the advantages of office, but not in office itself, are citizens (1279^{a}31–32); and women and children are implicitly included among the citizens (1260^{b}15–20, 1299^{a}20–23). Some of this apparent disunity is explained by the fact that a citizen is defined relative to a city and a constitution (1275^{a}33–^{b}21), so that a person might be referred to as a "citizen" even if he counted as a citizen only relative to a certain constitution. But it is also no doubt true that Aristotle sometimes uses the term in the loose and popular sense to apply to anyone who passes the sorts of pragmatic tests of citizenship mentioned in *Pol.* 3.2—e.g., having parents who are citizens. In every constitution, however, the office holders and the unconditional citizens are the same.

Citizen, Uncontested (*anupeuthunos*): Those whose citizen birth is clear on both sides (*Pol.* 1275^{b}22–26, 1292^{b}35–36).

City (*polis*)
A *polis* (plural: *poleis*) is a unique political arrangement, something like a city and something like a state (hence "city," "state," and "city-state," are all common translations). For unlike a city a *polis* enjoyed the political sovereignty characteristic of a modern nation-state (it could possess its own army and navy, enter into alliances, make war, and so on), whereas, unlike a typical state, it was a politically, religiously, and culturally unified community, and quite small-scale. Its territory included a single (typically) walled area, which is the "city proper (*astu*)," with a citadel (*akropolis*) and a marketplace, which, as the political and governmental heart of things, is itself often referred to as the *polis* (*Pol*. 7 provides many examples of this), and also included the surrounding agricultural land. Citizens lived there as well as inside the city proper.

Because a *polis* is a multitude of citizens (1274^{b}41), Aristotle's conception of it inherits some of the complexity inherent in his notion of a citizen. A *polis* is not just a multitude of citizens, however, but a community of citizens sharing a constitution (1276^{b}1–2), so that *poleis* with different constitutions are also different (1276^{b}10–11). Moreover, while a *polis* includes women, children, and slaves (1260^{b}8–20, 1269^{b}14–19, 1277^{a}5–10), strictly speaking only the unconditional citizens, who share in judicial and deliberative office, are genuine parts of it (1328^{a}21–^{b}2, 1329^{a}2–5, 1329^{a}19–24).

A *polis*, unconditionally speaking, is a political community consisting of free citizens governed by a constitution—a community of similar people aiming at the best life possible (*Pol*. 1328^{a}35–37). It is the natural community for human beings to live in (1253^{a}7–18, 1278^{b}19–25), since there, and only there, can they achieve the happiness that is their natural end.

Clan (*phratra*): See **Tribe**

Clepsydra: A clepsydra is a water clock in which time is measured by water dripping slowly from a small opening at the bottom when the top is opened. But when water is instead allowed to enter and then the top is closed, it also functioned as a pipette or syphon, which is how it is functioning at *Ph*. 213^{a}27, *Cael*. 294^{b}21.

Clever, Cleverness (*deinos*, *deinotês*): "The sort of thing that, when it comes to the things that further hitting a proposed target, is able to do these and to hit upon them" (*NE* 1144^{a}23–26). It is required for practical wisdom, but is not the same as it (1144^{a}28–29, 1152^{a}10–14).

Coarse-Grained, Fine-Grained (*pachus*, *leptos*): "What has small parts is fine-grained and what has large parts is coarse-grained" (*Cael*. 303^{b}26–27). When applied to things such as skin, membranes, or bone, however, coarse-grainedness implies thickness (and vice-versa), since a single layer of coarse-grained material is thicker than a single-layer of fine-grained material. Sometimes, then, *pachus* is "coarse," "thick," or (as applied to animals) "fat," *leptos* as "thin." The discussion of hairs in *GA* 5.3 is a revealing case in

point, since what explains their fineness or coarseness is the size of the ducts or pores in the skin—in other words, the skin's fine-grainedness or coarse-grainedness. When contrasted with *eurus* ("broad"), *leptos* is again "thin" (*HA* 512^{b}6).

Coincident (*sumbebêkos*): A standard Aristotelian contrast is between what has an affection coincidentally or contingently (*kata sumbebêkos—per accidens* in Latin), making the affection a coincident of it, and what has that affection intrinsically or non-contingently (*kath' hauto* or *per se*) (*Met*. 1022^{a}24–36). Affections that belong to something contingently are of no interest to a science of that thing, since they cannot be demonstrated to hold of it either universally or for the most part, and all science is demonstrative (1026^{b}3–5). But some coincidents are demonstrable and so are of interest to science. These are the intrinsic coincidents or *per se* accidents—"the coincidents connected to the substances" (*DA* 402^{b}18)—that are not parts of a thing's substance or essence, but are demonstrable from it, as having internal angles equal to two right angles is demonstrable from the definition of a triangle's essence (*APo*. 75^{b}1, 83^{b}19, *Met*. 1025^{a}30–32, 1078^{a}5–9).

Cold (*psuxis*): "Privation of heat" (*GA* 743^{a}36). Also, *Mete*. 380^{a}7–8, *PA* 649^{a}18–19, 784^{a}33, *Met*. 1070^{b}11–12.

Colliquescence (*suntêgma*, *suntêxis*): Sometimes colliquescences are residues (*PA* 677^{a}13), as is unconcocted nourishment. But sometimes the two are distinguished: "By a 'residue' I mean a leftover of the nourishment, by a 'colliquescence,' what has been secreted from a growth-producer by a contrary-to-nature dissolution" (*GA* 724^{b}26–28). Residues, such as excrement and urine, have natural exit points from the body, but "no place is assigned to a colliquescence in accord with nature, rather it flows wherever there is an easy route in the body, while to all the residues a place in accord with nature is assigned" (725^{a}33–35). Sweat is an example.

Column (*sustoichia*): (1) In *APr*. and *APo*. a *sustoichia* seems to be a series of terms of whatever sort. (2) At *Met*. 986^{a}23, 1093^{b}12, it is one of a pair of columns in a Pythagorean classification of starting-points, the first being that of good ones (*NE* 1096^{b}6) or noble ones, the second that of bad or evil ones. (3) At *Met.* 1004^{b}27 it is one of a pair of columns of opposites, one consisting of "positive" notions, the other of privations. 1066^{a}15 and 1072^{a}31 also refer to this, suggesting that it is a device or way of thinking that Aristotle himself accepts (*PA* 670^{b}21). (4) At *Met*. 1054^{b}35, 1058^{a}13 it is a "column of predication," and seems to be the sort relevant also at *Top*. 114^{a}35, where the adjective *sustoichos* applies to a column of co-ordinate predicates, one lot of which are inflections of the other.

Comedy (*kômô[i]dia*): Defined at *Po*. 1448^{a}17–18, 1449^{a}32–34, and discussed in F167.

Coming to Be, Generation (*genesis*): (1) "Among things that come to be, some do so by nature, some by craft, and some from chance, but they all come to be both as a result of something and of or from (*ek*) something, and they all come to be something"

(*Met*. 1032^{a}12–14). (2) "Things are said to come to be in many ways, and some things are said not to come to be but to come to be a this something, while only substances are said to come to be unconditionally" (*Ph*. 190^{a}31–33). (3) "Coming to be is to contraries and from contraries" (*GC* 331^{a}14). (4) To generate (*gennan*) something is to cause it to come to be, so that generation (also *genesis*) is the process of coming to be that is so caused. It is "the first participation in the heat of the nutritive soul" (*Juv*. 479^{a}29–30). (5) Passing away (*phthora*) is the contrary of coming to be. It "comes about owing to a failure of a certain sort of heat, which in complete living beings is the one found in the part in which the starting-point of their substance resides. This starting-point is located . . . where the up and the down are joined together: in plants midway between the stem and the root, in blooded animals in the heart, and in bloodless animals in the analogous part." (*Juv*. 478^{b}30–479^{a}1). If X causes Y to pass away, X destroys (*phtheirein*) Y.

Commerce, Craft of (*kapêlikê*): The part of wealth acquisition, but not of household management (*Pol*. 1257^{a}41–1258^{a}18), that produces wealth through exchange (1257^{b}20–22). It is concerned with money as opposed to natural wealth, and involves getting wealth at the expense of others. Usury (*obolostatikê*) is a part of it (1258^{a}38–^{b}2). See **Exchange, Craft of**

Common Things (*koina*): Things that are common to more than one science and special to none. Like acceptable beliefs, they can thus figure as premises in dialectical arguments (*Top*. 101^{a}30–34, *SE* 170^{b}8–11, *Rh*. 1355^{a}25–28). Indeed, the "most stable starting-point of all," the one it is "impossible to be deceived about" (*Met*. 1005^{b}11–12)—which is the principle of non-contradiction (1011^{b}16–17)—is such a belief, and "all who are carrying out a demonstration lead it back to this as an ultimate belief; for this is by nature the starting-point of all the other axioms too" (1005^{b}32–34). So logic, to call it that, is a common thing, since all sciences rely on it in constructing their demonstrations. See **Dialectic**

Communal Messes (*phiditia*, *sussitia*): A political institution, which Aristotle himself favors, that served both to feed citizens and to promote bonding between them (*Pol*. 1330^{a}3–8).

Community (*koinônia*): A community consists of people of different sorts, who engage in an enterprise that involves sharing something in common (*Pol*. 1260^{b}39–40), and who are bound to one another by a sort of friendship and a sort of justice as a result. A household, a city, and a constitution are thus all communities, but so are master and slave, partners in a business transaction, and fellow travelers (1263^{a}17). All or most of these are encompassed by the political community (1252^{a}5–6, *NE* 1160^{a}14–23).

Comparison (*parabolê*): Argument by analogy based on similarity.

Compelled, Compulsion: See **Necessary**

Complete (*teleion*): The adjective *teleios* is cognate with the noun *telos* ("end," "goal"). Some of its senses are distinguished at *Met*. 5.16. Completeness is attributed to the city

(*Pol*. 1252^{b}28, 1280^{b}40), to happiness (*NE* 1097^{a}34), to lives (1098^{a}18, 1101^{a}16), and to virtues (1098^{a}18, 1102^{a}6, 1129^{b}30), as well as to actions (*Met*. 1048^{b}22), differences (1055^{a}16), and many other things. (2) "Virtue is a sort of completion (for when each thing acquires its own virtue, at that point it is said to be complete—for then it is most of all in accord with its nature, just as a circle is complete when it has most of all become a circle and when it is best)" (*Ph*. 246^{a}13–16; also *Met*. 1021^{b}20–21). (3) Some things are complete because they have all their parts: "Living (*zôê*) can be complete or incomplete, and virtue is the same way (for in one case it is a whole, in another a part)" (*EE* 1219^{a}37–38; also *NE* 1130^{a}9). But others are complete in a different way: "what is unconditionally complete is what is always intrinsically choiceworthy and never choiceworthy because of something else" (*NE* 1097^{a}33–34). This latter sort of telic completeness seems to be the sort possessed by theoretical wisdom, since it is "the best and most complete" virtue (1098^{a}17–18, 10.8).

Composition, Composite (*sunthesis*): A composition is something that results from combination (*Rh*. 1365^{a}17) or putting together (*NE* 1174^{a}23), typically involving the acquisition of a form—or level of formation—that was previously lacked: "what encompasses, that is, the limit, is more estimable than what is limited; for the second is matter, but the first is the substance of the composition" (*Cael*. 293^{b}13–15).

Composition or Division (*sunthesis ê diairesis*): What is not so by composition is an untrue affirmative; what is not so by division is an untrue negative.

Compound, the (*sunolon*): "Whenever something is predicated of matter" (*Met*. 995^{b}35).

Comprehension (*sunesis*): Focally discussed at *NE* 6.10, †*MM* 1197^{b}11–17. The verb *epaïein* (*Met*. 981^{a}24, 996^{b}34), which is a synonym of "know" (*Rh*. 1360^{a}19, 31), is also occasionally "comprehend."

Conceive (*sullambanein*): A female conceives X when she holds X in her uterus (*HA* 583^{b}29–32). In normal cases X is a viable fetus to which she will later give birth. But in some cases, this may not be so (*GA* 748^{b}21–23), and in others X may not be a fetus at all (*HA* 636^{a}9–28, *GA* 4.7).

Conclusion (*sumperasma*): What follows of necessity from the premises of a deduction.

Concoction (*pepsis*): "A completion due to the natural and proper heat . . . [produced] from the opposing affectables, these being the matter proper to the given thing. For when it has been concocted, it is completed and has come to be. . . . And the end in some cases is the nature—but nature, we say, as form and substance. . . . Concoction, in fact, is what everything is affected by when its matter—that is, its liquid—is mastered; for this is what is determined by the heat in its nature. For as long as the ratio is present in the latter, it is this that constitutes its nature" (*Mete*. 379^{b}18–35).

Condensation and Rarefaction (*puknôsis kai manôsis*)
(1) "The starting-point of all affections is condensation and rarefaction; for heavy and light, soft and hard, hot and cold, seem to be sorts of density or rarity. And condensation and rarefaction are aggregation and disaggregation, in virtue of which substances are said to come to be and pass away" (*Ph*. 260^{b}7–12). (2) "A thing is dense because its parts are close to one another, and rare because its parts are separated from each other" (*Cat*. 10^{a}20–22). Sometimes "open-structured" better captures the meaning of *manos* (*HA* 548^{a}32).

Consideration: *Gnômê*

Constitution (*politeia*): (1) A constitution is "a sort of life of a city" (*Pol*. 1295^{a}40–^{b}1), "a certain ordering of those who inhabit the city" (1274^{b}38) or of its various offices, "above all, of the office that controls everything" (1278^{b}9–10). And because "in every case the governing body (*politeuma*) controls the city," it gets identified with the constitution (1278^{b}10–11). (2) It is "by pursuing [happiness] in different ways and by different means each group of people produces different ways of life and different constitutions" (1328^{a}41–^{b}2). (3) A citizen is someone who shares in the constitution of his city, so that *politeia* is also citizenship, as at *Ath*. 54.3. See **Polity**

Constitution, Correct vs. Deviant
Constitutions that aim at "the common advantage are, in accord with what is unconditionally just, correct, while those that aim only at the advantage of the rulers are erroneous, and deviations from the correct constitutions" (*Pol*. 1279^{a}17–20). However, Aristotle does not specify the group G whose advantage is the common one. A natural first thought is that G should consist of all the free native inhabitants of the constitution. On that account, however, even some correct constitutions, such as a polity, will count as deviant. For the common advantage in a correct constitution is a matter of having a share in noble or virtuous living (1278^{b}20–23). A polity will thus not aim at the advantage of its native-born unrefined craftsmen, tradesmen, or laborers, since there is "no element of virtue" in these occupations (1319^{a}26–28). A second natural thought—in part a reaction to the first—is that G should consist of the unconditional citizens, who share in judgment and office (1275^{a}22–23). Yet even the deviant constitutions seem to aim at the advantage of a wider group than that, one that includes the wives and children of those eligible for such offices (1260^{b}8–20, 1280^{b}40–1281^{a}1, 1310^{a}34–36).

Though these attempts to define G all fail, the last does point in a promising direction. Begin with the class N of the free native inhabitants of the constitution. There are two ways to construct the class of unconditional citizens from N. The first is on the basis of the sort of justice internal to the constitution, the second on the basis of unconditional justice. If we proceed in the first way, and the constitution is an oligarchy, the unconditional citizens will be the rich male members of N. But if we proceed in the second way, the unconditional citizens of the oligarchy will be those who have an unconditionally just claim to that status. And Aristotle thinks that the virtuous, the rich, and the poor all have such a claim, one that is proportional to their virtue

(*Pol.* 1280^{b}40–1281^{a}8, 1283^{a}14–26, 1294^{a}19–20). So they ought to be unconditional citizens of any constitution. In fact, however, they are such only in correct constitutions, not in deviant ones.

We may now construct G as follows: all the members of N, who have an unconditionally just claim to be unconditional citizens of the constitution, are members of G; all the wives and children of members of G are members of G; no one else is a member of G. If a constitution aims at the advantage of G, it aims at the common advantage and is correct; if it aims at the advantage of the subset of G consisting of the rulers who have control of the constitution (and their families) it is deviant. This seems to be what Aristotle has in mind when he writes: "the just is the political good, and this is the common advantage" (*Pol.* 1282^{b}16–18). Nonetheless, while a correct constitution aims only at the advantage of G, Aristotle almost certainly thinks that it will be advantageous to all its members, whether they are members of G or not. He thinks this about household slaves (1252^{a}34, 1278^{b}32–37), so also, perhaps, about the public slaves or barbarian serfs who do all the work in his ideal constitution.

Within the class of deviant constitutions Aristotle also draws a distinction between deviant constitutions and their extreme or ultimate exemplars, which are so degenerate that they do not count as constitutions at all (*Pol.* 1292^{a}31, 1272^{b}2–3, 1293^{b}29, 1309^{b}34-35, 1289^{b}2, 1266^{a}3–4).

Constitution, Those Who Share in the: In the best city, (1) "all the citizens share in the constitution" (*Pol.* 1332^{a}34–35), suggesting a contrast with other cities in which this is not so, and thus also apparently drawing a contrast between sharing in the constitution and being a citizen. Similarly, (2) those who hold office are contrasted with "those in the governing body" and "those outside the constitution" (1308^{a}5–7). Since "the constitution is the governing body" (1278^{b}11), and an unconditional citizen is "defined by nothing else so much as by his participation in judgment and office" (1275^{a}22–23), the natural way to interpret (1) and (2) seems to be this: those who share in the constitution are those participants in judgment and office (i.e., the unconditional citizens) who belong to the governing body—these being the citizens who occupy or are eligible to occupy "the offices that have control of the constitution" (1309^{a}30). In the best city, then, all the unconditional citizens share in the constitution because all eventually become members of the governing body (1332^{b}35–1333^{a}3). We must distinguish, then, between the offices that are keyed to unconditional citizenship and "the most important offices" (1273^{a}29–30, 1294^{b}29–31) or "those that must most of all be called 'offices'" (1299^{a}25) that are keyed to membership in the governing body and that control the constitution.

Contact, Making (*haptesthai*): "Things are making contact [or touching] when their extremes are together in place" (*Met.* 1068^{b}27).

Contemplation (*theôria*): See **Theoretical Investigation**

Contemplative (*theôrêtikos*): See **Practical**

Contempt (*oligôria*): "There are three forms of contempt: despising, spite, and wanton aggression; for the one who despises is contemptuous; for the things people despise are the ones they think are worth nothing, and the ones they think are worth nothing they have contempt for" (*Rh*. 1378^{b}13–17).

Contentious Arguments (*eristikoi logoi*): "Those that deduce or appear to deduce from what appear to be acceptable beliefs, but are not" (*SE* 165^{b}7–8).

Contiguous (*echomenon*): "Successive and making contact" (*Met*. 1069^{a}1–2).

Continuous (*suneches*): "Two things are continuous when the limits of each, by which they make contact and by which they are kept together, become one and the same" (*Met*. 1069^{a}5–7).

Contradiction (*antiphasis*): "A contradiction is an opposition in which there is intrinsically no intermediate" (*APo*. 72^{a}12–13; also *Met*. 1011^{b}23–24).

Contrary (*enantios*): (1) "Said to be contraries are: Those things differing in kind that cannot belong to the same thing at the same time. The most different of the things in the same kind. The most different of the things in the same recipient. The most different of the things falling under the same capacity. The things whose difference is greatest either unconditionally or in kind or in form" (*Met*. 1018^{a}25–31; also 1055^{b}13–17). (2) "Contraries are affected by, and affect, each other, and are destructive of each other" (*Cael*. 286^{a}33–34). (3) "Things in the same receptive subject that differ the most are contraries (for the matter for contraries is the same)" (*Met*. 1055^{a}29–30; also *Top*. 113^{a}34–35, *Somn*. 453^{b}27–29). (4) "Contraries cannot belong to the same thing at the same time" (*Met*. 1011^{b}17–18). See **Opposite**

Control, Having: See *Kurios*

Convention: See **Law**

Convert (*antistrephein*): *Antistrephein* is used to signify the following: (1) A logical relation between propositions, so that the universal negative converts, because if no B is A, then no A is B (*APr*. 25^{a}5–6), and so on. (2) A logical relation between terms (51^{a}4–5), equivalent to counterpredication (*Top*. 102^{a}19). (3) The substitution of one term for another, without logical convertibility (*APr*. 64^{a}40). (4) The (valid) inference of (A admits of not being B) from (B admits of being A) (32^{a}30). (5) The substitution of the opposite of a premise for a premise (59^{b}4). (6) An argument in which from one premise in a syllogism, and the opposite of the conclusion, the opposite of the other premise is deduced (*APr.* 2.8–10, *Top*. 163^{a}32–34). (7) At *Top*. 109^{a}10, and only there it seems, A and B convert if and only if (B *belongs* to A) implies (A *is* B). (8) At *GC* 328^{a}19, however, conversion seems to be affective reciprocity, so that A and B convert if and only if A affects and is affected by B and vice versa. (9) At *Somn*. 456^{b}21 it refers to the "turn" of the tide.

Co-ordinates (*sustoicha*): See **Column**

Cotyledons (*kotulêdones*): Pits in the modified wall of the uterus into which fit the villi of the outside membrane of the embryo. The name derives from the suckers on the arms of cuttlefish.

Courage (*andreia*): Discussed in *NE* 3.6–9, *EE* 3.1. See **Virtue**

Craft (*technê*)

The focal, but not the most helpful, discussion is *NE* 6.4. A craft is a science that is neither practical (concerned with action) nor theoretical (concerned with truth) but productive: "From craft the things whose form is in the soul come to be (and by 'form' I mean the essence of each thing and the primary substance). . . . Of comings into being and movements, one part is called 'understanding' and the other 'producing'—what proceeds from the starting-point and form is understanding, what proceeds from the final stage of understanding is producing" (*Met*. 1032^{a}32–^{b}17).

Aristotle distinguishes between different levels of craft knowledge and, correlatively, between craftsmen of different degrees of accomplishment. The lyre player and the good lyre player have the same craft and work, but it is characteristic of an excellent one "to do it well" (*NE* 1098^{a}12). Some craftsmen know all that is in the craft handbook, so to speak, but when it comes to problems that lie outside it, and so require deliberation, they sometimes arrive at reasons that are false (1140^{a}28–30). These people know all the true handbook reasons but not the true deliberative ones. They may be good craftsmen for routine jobs, but, lacking the relevant sort of wisdom, they cannot deal with really hard cases. Other craftsmen are wise in that they are the most exact practitioners of their craft (1141^{a}9–10). They know not just the true handbook and deliberative reasons but the ultimate explanatory ones—those that might be found in the most exact treatises on the craft's starting-points. What distinguishes "those doctors who pursue their craft in a more philosophical manner" is that their search for the "primary starting-points of health and disease" (*Sens*. 436^{a}17–^{b}1) leads them to begin by considering nature in general (also *Juv*. 480^{b}21–30).

This third class is that of the architectonic craftsmen, who, because they know the ultimate explanatory starting-points, have the most control, the most authority, and political science seems to be "the most architectonic one" (*NE* 1094^{a}27). Hence, "strictly speaking, the ones who above all do actions, even external actions, are the architectonic craftsmen who do them by means of their thoughts" (*Pol*. 1325^{b}21–23). When Aristotle says that "craft does not deliberate" (*Ph*. 199^{b}28), he means that a craft, insofar as it is exact, fully developed, and self-sufficient, does not do so (*NE* 1112^{a}34–^{b}1).

Craft imitates nature (*Ph*. 194^{a}21–2, *Mete*. 381^{b}6) and nature's operations are often analogized to those of craft (*GA* 730^{b}11–23), to which is assigned the completion of things that nature is "incapable of bringing to completion" (*Ph*. 199^{a}16; also F90 50.1). The products of crafts are substances (190^{b}6), but as not composed by nature, they are not substances of the most canonical or primary sort (*Met*. 1041^{b}28–29, 1043^{b}21–23).

Unlike virtues, crafts can be used to achieve either good or bad ends (*Met*. 1046^{b}4–24, 1048^{a}8–11, *NE* 1106^{a}6–9, 1140^{b}22–23, *Rh*. 1355^{b}2–7).

Craft Incompetence (*atechnia*): The cognitive condition of someone who pretends to have craft knowledge and gives false craft reasons. It is not mentioned except at *NE* 1140^{a}21, although the quality of being *atechnos* is mentioned many times.

Craftsman (*technitês*): The term *technitês* is often accompanied in Aristotle by the term *banausos* ("unrefined"), as at *Pol*. 1258^{b}26, which can be a near synonym of *phaulos* ("base"). Though such craftsmen are somewhat free and somewhat enslaved, they seem to be further removed from virtue than slaves are (*Pol.* 1260^{a}39–^{b}1). Yet nothing in their nature fits them to do the work they do (1260^{b}1–2). Instead, it seems to be their work itself that prevents them from acquiring virtue and being happy (1337^{b}4–21), suggesting that if they had not become unrefined craftsmen, they might (other things being equal) have been capable of virtue. They are typically distinguished from farmers, tradesman, hired laborers (1289^{b}32–33, 1317^{a}24–26), free people (1340^{b}9–10), and hoplites (1326^{a}23), and grouped together with wage earners (1337^{b}13–14). At the same time, crafts themselves are ranked in their level of lack of refinement, with "the most unrefined, [being] those in which the body is most damaged; the most slavish, those in which the body is used the most; the most ill-bred, those least in need of virtue in addition" (1258^{b}37–39). At *SE* 168^{b}6, however, we find the phrase "the craftsmen and scientists generally," which suggests that the craftsmen being linked to philosophers at *Rh*. 1397^{b}23–24 are the more scientific ones, such as doctors, rather than handicraftsmen. At *Div. Somn.* 463^{a}5–7 "sophisticated doctors" are referred to as craftsmen.

Crook-taloned: *Gampsônux*

Crumbly (*psathuron*): When applied to liquids, "non-viscous."

Cuttlefish: *Sêpia*

Cynicism (*kakoêtheia*): "Taking everything in the worst way" (*Rh*. 1389^{b}20–21). As applied to animals—or sometimes to people—*kakoêthês* means "has a bad character" (*HA* 613^{b}23).

Daimonic (*daimonios*): What is *daimonios* is either "a god or the work of a god" (*Rh.* 1398^{a}16); a substantive *daimôn* is either a god or the child of a god (1419^{a}8–12). Nature is *daimonios* (*Div. Somn.* 463^{b}14), as are religious matters (*NE* 1122^{b}21, *Pol.* 1322^{b}21), and the things that theoretically wise people know (*NE* 1141^{b}7). Luck (*Ph.* 196^{b}7), dreams (*Somn*. 453^{b}23–24), and false pregnancies (*HA* 636^{a}24) merely seem to be *daimonios*.

Daktulos: **Finger**

Dancing (*orchêsis*): "The craft of dancers makes use of rhythm only, without harmony—for these people too, through the rhythms that are shaped [into movements], produce imitations of characters, feelings, and actions" (*Po*. 1447^{a}26–28).

Death (*thanatos*): The destruction of vital heat (*Juv*. 469^{b}19–20).

Decency, Decent (*epieikeia*, *epieikês*): (1) *Epieikês* is sometimes used interchangeably with *agathos* ("good") (as at *NE* 1137^{b}1, 1168^{a}33, 1172^{b}11). (2) When contrasted with ordinary people (*hoi polloi*), the *epieikês* is usually the one who is better off and more respectable (1167^{b}1), but not always (*Ath*. 26.1). (3) What makes someone *epieikês*, in the ethical sense, is that he is fair-minded and considerate of others (*NE* 1143^{a}21–24), so that someone who is *epieikês* is characterized in particular by an attitude to legal justice that pays more attention to fairness than to the letter of the law (1137^{b}34–1138^{a}3). As a result, *epieikeia* is close in meaning to our "equity."

Decree (*psêphisma*): A law is a relatively permanent enactment, universal in scope, and applicable on many different occasions. A decree is an enactment, adapted to particular circumstances (*NE* 1137^{b}27–32), stating what is to be done in a particular case, and so is the last thing reached in a piece of practical deliberation (1141^{b}27–28, 1151^{b}14–16). The political liabilities of government by decree rather than law are discussed at *Pol*. 1292^{a}6–37.

Deduction (*sullogismos*)

To understand what a deduction is, we must begin with the sorts of statements or propositions that are its premises and conclusion. A statement (*logos apophantikos*) is the true (or false) predication of a single predicate term A of a single subject term B, either as an affirmation (*kataphasis*) (A belongs to B) or a denial (*apophasis*) (A does not belong to B) (*Int.* 5, 8). What makes a term a single subject term, however, is not that it is grammatically singular or serves as a grammatical subject but that it designates a substantial particular—a canonical example of which is a perceptible matter-form compound, such as Socrates. Similarly, what makes a term a predicate is that it designates a universal (man, pale)—something that can have many particular instances. When the role of predicate is restricted to universals, therefore, while that of subject is left open to both particulars and universals, it is more on ontological or metaphysical grounds than on what we would consider strictly logical ones. Subjects and predicates are thus ontological items, types of beings, rather than linguistic or conceptual ones, and logical principles, such as the principle of non-contradiction, are very general ontological principles, truths about all beings as such, or qua beings.

Particular affirmations (Socrates is a man) and general affirmations (Men are mortal) have the same subject-predicate form, but when the subject is a universal, the affirmation may itself be either universal (All men are mortal) or particular (Some men are mortal)—that is to say, the predicate may be asserted (or denied) of the subject either universally (*katholou*) or in part (*kata meros*) or, if the quantifier is omitted (Men are mortal), indeterminately (*adihoristos*). Affirmations, as a result, are of four types: A belongs to every B (aAB), A belongs to no B (eAB), A belongs to some B (iAB), A does not belong to every B (oAB).

"A deduction is an argument in which, certain things having been assumed, something different from the things assumed follows of necessity in virtue of their being so" (*APr.* 24^{b}18–20). It consists of a major premise, a minor premise, and a conclusion,

where the premises have exactly one "middle" term in common, and the conclusion contains only the other two "extreme" terms. The conclusion's predicate term is the *major term*, contributed by the major premise; its subject is the *minor term*, contributed by the minor premise. The middle term must be either subject of both premises, predicate of both, or subject of one and predicate of the other. The resulting possible combinations of terms yield the so-called figures of the syllogism:

	First Figure		Second Figure		Third Figure	
	Predicate	Subject	Predicate	Subject	Predicate	Subject
Premise	A	B	A	B	A	C
Premise	B	C	A	C	B	C
Conclusion	A	C	B	C	A	B

Systematic investigation of the possible combinations of premises in each of these figures results in the identification of the *moods* or modes that constitute valid deductions. In the first figure, these are as follows:

Form	Mnemonic	Proof
aAB, aBC| aAC	Barbara	Perfect
eAB, aBC| eAC	Celarent	Perfect
aAB, iBC| iAC	Darii	Perfect
eAB, iBC| oAC	Ferio	Perfect

A mood is perfect when there is a proof of its validity that is *direct*, in that it does not rely on the validity of any other mood. Only first figure syllogisms have perfect moods.

Besides their logical interest as admitting of direct proof, perfect syllogisms in Barbara are also of particular importance to science. First, because "among the [syllogistic] figures, the first is most scientific" (*APo.* 79^{a}17–18). Second, "only through this figure is it possible to hunt down scientific knowledge of the what-it-is" (79^{a}24–25): essences hold universally, only perfect syllogisms in Barbara have universal conclusions, and definitions of essences, which are scientific starting-points, must hold universally.

Practical deductions are mentioned at *NE* 1144^{a}31–32 and discussed there, at 1147^{a}25–^{b}3 (involving lack of self-control), *DA* 434^{a}16–21, and *MA* 7. A productive example is given at *Met.* 1032^{b}6–9. See **Deliberation**; **Science**

Deduction, Contentious (*eristikos sullogismos*): "A contentious deduction is one that proceeds from what appear to be, but are not, acceptable beliefs, or an apparent deduction from what are, or what appear to be, acceptable beliefs; for not everything that appears to be an acceptable belief actually is one" (*Top*. 100^{b}23–26).

Deduction, Dialectical (*dialektikos sullogismos*): "A deduction is dialectical when it deduces from acceptable beliefs" (*Top*. 100^{a}29–30). In a dialectical encounter it is what lies behind a questioner's questions, partly dictating their order and content, and partly determining the strategy of his attack.

Define, Definition (*horizein*, *horismos*, *horos*): (1) "One sort of definition is an indemonstrable account of the what-it-is; another is a deduction of the what-it-is, differing in inflection from a demonstration; a third is the conclusion of a demonstration of the what-it is" (*APo*. 94^{a}11–14). (2) "A definition is an account that signifies the essence" (*Top*. 101^{b}38). (3) "A definition is composed of a kind and a difference" (103^{b}15–16; also *Met*. 1037^{b}29–30). (4) "The ultimate difference will be the substance of the thing and its definition" (*Met*. 1038^{a}19–20). (5) "A definition is a sort of number; for it is divisible, and indeed into indivisibles (for the accounts are not unlimited), and number is like that" (1043^{b}34–36). (6) "One sort [of definition] will be an account of what a name, or some other name-like account, signifies" (*APo*. 93^{b}30). Both sorts of definitions say what something is, but do not assert that it is (72^{a}21–24). (7) "Every definition is always universal" (97^{b}25). (8) "In a definition nothing is predicated of anything else" (90^{b}34–35).

Defining Mark (*horos*): A common meaning of the noun *horos*, from which verb *horizein* ("define") derives, is "term," in the logical sense in which a syllogism has three terms. But often a *horos* is a definition or a defining mark (a boundary marker is a *horos*) that gives—often perceptible—definition to what would otherwise lack it (*Pol*. 1258^{a}18, 1267^{a}29, 1326^{a}35). Hence the doctor's *horos* is the thing "by reference to which he judges what is a healthy body and what is not" (*EE* 1249^{a}23–24). The *horos* of health in a muscle might be a certain uniform or smooth state, which the doctor can detect by touch (*Met.* 1032^{b}6–10), or that of fever in a patient, his visible paleness (†*MM* 1208^{a}23–30).

Deformation, Disability (*pêrôma*): A *pêrôma* has an effect on functioning and may be part of a thing's nature: femaleness is "like a natural deformation" (*GA* 775^{a}15–16), negatively affecting the ability to reproduce (728^{a}18–21), while the seal's lack of ears, also a natural deformation, is advantageous to it (781^{b}22–28). But someone may be *pêros* ("blind") not by nature but simply as a result of an accident or a condition such as drunkenness (*NE* 1114^{a}25).

Deiktikos: **Probative**

Deinos: **Clever**

Dektikos: See **Recipient, Primary**

Deliberate Choice (*prohairesis*): (1) Choosing (*haireisthai*) one thing before or in preference to (*pro*) another (*NE* 1112^{a}16–17), and so deliberating about what things should be done earlier than or in preference to others in order to further a desired end: "it seems characteristic of the person with understanding to choose the better of two things

in every case" (*EE* 1237^{b}36–37). (2) "The objects of deliberation and of deliberate choice are things that further the end" (*NE* 1113^{b}3–4).

Deliberation (*bouleusis*)

Bouleusis has a broad sense and a narrow sense. In the broad sense, a craftsman—such as a doctor, navigator, or physical trainer—can deliberate about what to do when his craft does not provide explicit directions (*NE* 1112^{a}34–^{b}9, *EE* 1227^{a}20–21). In the narrow sense, the "unconditionally good deliberator . . . is the one capable of aiming at and hitting, in accord with rational calculation, the best for a human being of things doable in action" (*NE* 1141^{b}12–14), so that deliberation of this sort is exclusively a practical or action-related matter. In either sense, "we deliberate not about ends, but about the things that further ends" (1112^{b}11–12).

Like reasoning in the broadly theoretical sciences, deliberation is "like a sort of deduction" (*Mem*. 453^{a}14). But while theoretical deductions have a propositional conclusion, practical ones conclude in an action: "if everything sweet should be tasted and this (as one of the particulars) is sweet, it is necessary for the person who is able and not prevented also to do it at once" (*NE* 1147^{a}29–31). But, though the conclusion of a practical or deliberative deduction is an action, the last thing reached in deliberation is not an action but a decree: "a decree is doable in action, as the last thing" (1141^{b}27–28). Conclusion and last thing, though easily confused, are thus not the same. It is "the final premise," as a belief about something perceptible and doable in action, that controls actions (1147^{b}9–10). For once the relevant decree is reached, nothing remains except to act on it immediately. And act on it the agent must if he is to be practically wise: "a person is not practically wise by knowing alone but also by being a doer of the action" (1152^{a}8–9). It follows that the conclusion cannot be a decree of any sort but must be an action that makes the (propositional content of the) decree true.

The ultimate end at which we aim in all our actions is the good doable in action: "if there is some end of all the things doable in action, this would be the good doable in action" (*NE* 1097^{a}22–23). So the ultimate or unconditional topic for the practical deliberator is, What in these circumstances constitutes the good doable in action, G? He will have answered it when he finds a middle term F for his deliberative deduction that has the following features: first, doing an action that is F in these circumstances will best further G; second, an F action is one he can do (or begin to do) in these circumstances without doing anything else; third, an F action is one he can tell he is doing on the basis of perception, "when actually doing the thing" (*EE* 1226^{a}39).

A deduction with these major and minor premises need not—and typically will not—embody the entirety of the deliberator's reasoning or inquiry, but it does constitute its focus: it tells him what he is ultimately looking for: a middle term with the requisite features. Nonetheless, to find such a term he may need to find many other things first. Some of these a science or craft may provide, some may be provided by perception, some he may need to find by further deliberating, some will identify external means to his subordinate ends, others their essential components. But all of them will fall under the umbrella of his focal deduction. So that in being the focus of

his deliberation it is also the organizing and unifying principle of his plan of action. It is the complex action implementing this entire unified plan, in turn, that constitutes his acting well, or achieving G.

Because all practical deliberation has a deduction of this kind as its organizing focus, we may take it as our paradigm case and assign it the following schematic form:

Major premise:	Definition of G
Minor premise:	Decree
Conclusion:	Action

Deliberation, as a consequence, will consist in a search for a decree connecting the definition of G to something that can be acted on directly, using perception. That is why just two errors are possible in practical syllogizing: "sometimes they achieve everything that furthers the end, but the end they set up is a base one, and sometimes they make both errors" (*Pol.* 1331^{b}30–34). The formal invalidity of the deduction is omitted, presumably, because it is not a peculiarly deliberative matter. Hence, though it contaminates deliberation, it is not a defect peculiar to it, which it is part of its specific virtue or correctness to avoid, but rather shows "a lack of educatedness in analytics" (*Met.* 1005^{b}3–4).

The error in setting up the end if you are a doctor consists in getting the definition of health wrong: the condition of the body you think is health is not health. If you are an agent, it consists in getting the definition of G wrong: you think that the good doable in action consists in satisfying your appetites or acquiring high honors, but you are wrong. As errors about the essential and necessarily true definitions of universals, which are established inductively, not deliberatively, these too are scientific errors, not specifically deliberative ones. But the second error, which consists in being wrong about what best furthers the end you may have set up quite correctly, is a deliberative one. It is described as reaching the correct end by "a false deduction—that is, reach the thing one should do but not by the means one should, the middle term being false" (*NE* 1142^{b}22–24).

What G in fact is, is determined by our unchangeable nature and work: "perhaps to say that happiness is the best good appears to be something [generally] acknowledged, and a clearer statement of what it is is still required. Maybe, then, this would come about if the work of the human being were grasped" (*NE* 1097^{b}22–25). Hence the definition of it that serves as a deliberative deduction's major premise is itself fixed and unchangeable—which is another reason we cannot deliberate about it. Its being so, in fact, is an essential condition of the deduction itself being practical or action determining. This is so because for something to produce movement it has to have a ball-and-socket-like structure (*DA* 433^{b}22–27), in which something is fixed (the socket, the definition of G, and the understanding's scientific knowledge of it) and something else moves (the ball, the practical deduction's minor premise). The scientific knowledge of the universal premise cannot change, since it is a state whose object is a necessary truth concerning the relations between the universals F and G. So by nature it remains

fixed from situation to situation. Which particular action will be F and which particular person will be such as to be able or required to do it, on the other hand, do change from one situation to another.

Dêloô: The verb *dêloô* means "make clear," "make known," "disclose," "reveal," and is sometimes used as an equivalent of *sêmainein* ("signify"). "Indicate" sometimes seems to best capture its meaning, especially in *Top*. and *SE*.

Delphian Knife: Apparently, a multipurpose tool of some sort.

Dêmagôgos: **Popular Leader**

Deme (*dêmos*): See **Tribe**

Democracy (*dêmokratia*)
Democracy, which is the most moderate of the deviant constitutions (*Pol*. 1289^{b}4–5), is a deviant form of polity. For, unlike the latter, where the many rule for the common advantage, a democracy is rule of the many "for the advantage of the poor" (1279^{b}8–9). But this definition captures its essence only coincidentally (1279^{b}34–38), since democracy is unconditionally the rule of the poor for the sake of the poor (1280^{a}2–3), and so of the free for the sake of the free. For "in freedom all share" (1280^{a}5; also 1290^{a}40–^{b}3), and "the hypothesis of the democratic constitution is freedom" (1317^{a}40–41).

Such rule, however, comes in a number of different varieties, which Aristotle distinguishes in different (and not obviously equivalent) ways: (1) At *Pol*. 1306^{b}20–21, he distinguishes between (1a) democracy based on law and (1b) one in which the people have complete control. (2) At 1291^{b}30–1292^{a}38 he distinguishes five forms of democracy: (2a) the rich and the poor are equal by law and neither has control; (2b) offices are filled on the basis of a low property assessment; (2c) all uncontested citizens share in the constitution and the law rules; (2d) all citizens (contested or uncontested) share and the law rules; (2e) the same as (2d) except the citizens, not the laws are in control. (2a–d) are presumably sub-varieties of (1a), whereas (2e) is identical to (1b). (3) At 1292^{b}22–1293^{a}12, on the other hand, just four forms of democracy are listed, which seem to correspond to (2b–e).

This list, like the one given in 6.4, omits (2a), perhaps because it combines elements of democracy (rule by the many) and oligarchy (rule by the few) and so is more of a polity than a democracy. Distinctions here are somewhat fluid, as Aristotle recognizes (*Pol*. 1293^{b}33–38). The recipe given at 1319^{a}39–^{b}1 for constructing the various forms of democracy, which is based on the various sorts of common people distinguished at 1290^{b}39–1291^{a}10, does not seem to result in (2b–e) in any obvious way.

Dêmokratia: **Democracy**

Demonstration (*apodeixis*): See **Science**

Demonstration by Reducing to the Impossible: Usually now referred to as *reductio ad absurdum*.

Dêmos: **People**

Denial (*apophasis*): See **Affirmation**

Dense (*puknos*): See **Condensation and Rarefaction**

Denunciation (*endeixis*): A legal action (*Ath*. 29.4, 52.1, 63.3) distinguished by the fact that the prosecutor could arrest the defendant and put him in the public prison to await trial. See **Indictment**; **Writ**

Desire (*orexis*): "Desire comprises appetite, spirit, and wish" (*DA* 414^{b}2–3; also *EE* 1223^{a}27–28).

Diagram (*diagramma*): A *diagramma* is (1) a diagram or figure (*Cat*. 14^{a}38–^{b}1); (2) the construction of such a figure as part of a demonstration (*Met*. 998^{a}25, 1051^{a}22, *NE* 1112^{b}21).

Diaitêtês: **Arbitrator**

Diakrisis: **Disaggregation**

Dialectic (*dialektikê*): A problem (*problêma*) is posed: Does B belong to A, or not? The answerer must answer yes or no. The questioner must refute him by asking questions—by offering him premises to accept or reject. The questioner succeeds if he forces the answerer to accept a proposition contrary to the one he undertook to defend (*SE* 165^{b}3–4). The questioner fails if the answerer always accepts or rejects premises in a way consistent with that proposition. To a first approximation, dialectic is the capacity that enables someone to play the role of questioner or answerer successfully (*Top.* 100^{a}18–21, 164^{b}2–4). It is focally discussed in *Top.* and *SE*, with useful additions at *Int*. 22^{b}22–30, *APr*. 24^{a}16–^{b}15, 46^{a}3–30, 64^{b}28–65^{a}25, 68^{b}8–37 *APo*. 72^{a}8–11, 77^{a}26–35, 77^{b}34–78^{a}13, 81^{b}18–23, 97^{b}37–39, *Ph*. 184^{b}25–185^{a}20, *GC* 316^{a}5–14, *DA* 402^{b}16–403^{b}16, *GA* 747^{b}27–748^{a}16, *Met*. 995^{b}18–25, 1004^{b}10–26, 1005^{b}5–25, 1029^{b}1–1030^{b}13, 1061^{b}8–11, 1078^{b}17–30, *NE* 1145^{b}2–7, 1146^{a}21–27, *Rh*. 1354^{a}1–1355^{b}22, 1356^{a}25–1358^{a}35, 1359^{b}2–16. See **Logico-linguistic**

Dialectical Arguments: "Those that deduce from acceptable beliefs in a way that reaches a contradiction" (*SE* 165^{b}3–4).

Dialectical Premise (*protasis dialektikê*): "A dialectical premise is one to which it is possible to answer yes or no" (*Top*. 158^{a}15–17).

Dialektos: **Speech**

Dianoia: **Thought**

Diaphora: See **Kind**

Diaphragm (*diazôma*, *hupozôma*): The division between the thorax and the abdomen, which is the diaphragm proper in mammals, and its analog in other animals, such as the waist in insects. Also called the "midriff (*phrenes*)." It is discussed in *PA* 3.10.

Diastêma: **Dimension**

Diastrephein: **Distort**

Diathesis: **Disposition**

Diazôma: **Diaphragm**

Dictator (*aisumnêtês*): Holder of an elective tyranny that is in accord with law.

Didactic Arguments (*didaskalikoi logoi*): "Those that deduce from the starting-points proper to a given subject and not from the beliefs of the answerer (for the learner must take things on trust)" (*SE* $165^{b}1$–3).

Didaskalikê: **Teaching**

Difference (*diaphora*): See **Kind**

Dignity (*semnotês*): "A mean between surliness and being ingratiating" (*EE* $1233^{b}35$–36).

Dikaiosunê: **Justice**

Dikastês: **Judge**

Dimension, Interval (*diastêma*): A *diastêma* in music is an interval and, in spatial magnitudes, a dimension (*Ph*. $209^{a}4$). By extension, just as there are extreme and middle terms in a syllogism, so syllogisms themselves are *diastêmata* or intervals connecting the minor term to the major term (*APr*. $42^{b}10$), while premises are sub-intervals of those intervals, so that *protasis* ("premise") and *diastêma* can be equivalent ($26^{b}1$). Terms, as sub-intervals of those sub-intervals, are also *diastêmata*, so that the number of terms in a sequence of syllogisms is equal to the number of *diastêmata* in them ($42^{b}1$–26).

Disaggregation (*diakrisis*): "The aggregating of things of the same kind; for this results in removing what is alien" (*GC* $329^{b}27$–29).

Discern, Judge (*krinein*): Judging typically involves reasoning of some sort (*Met*. $995^{b}3$, $1009^{b}2$, $1063^{a}13$); discerning, as when the perceptual modalities even of non-rational animals discern colors, flavors, and the like (*DA* $418^{a}14$, $424^{a}5$, $427^{a}20$, $428^{a}3$), does not.

Disposition (*diathesis*): "The arrangement of what has parts with respect either to place or capacity or form; for it must be some sort of position, as the name 'dis*position*' also indicates" (*Met*. $1022^{b}1$–3).

Dissections (*Anatomai*): Diogenes Laertius 5.25 (102) mentions a seven-book *Dissections*, which is no longer extant. Aristotle often refers to it, especially in the biological treatises. See 98^{a}2, 456^{b}2, 474^{b}9, 478^{b}1, 483^{b}24, 497^{a}32, 509^{b}23, 511^{a}13, 525^{a}8, 529^{b}19, 530^{a}31, 565^{a}12, 566^{a}15, 650^{a}31, 666^{a}9, 668^{b}29, 674^{b}16, 677^{a}9, 746^{a}22, 35, 680^{a}1, 684^{b}4, 689^{a}18, 696^{b}14, 719^{a}10, 740^{a}23, 746^{a}14, 771^{b}32, 779^{a}8.

Distinctness (*heterotês*): "Difference is not the same as distinctness. For the distinct and what it is distinct from are not necessarily distinct in some respect (for whatever is a being is either distinct or the same), but the different is different from something in some respect, so that it is necessary for there to be something that is the same whereby they differ. And this thing that is the same is kind or form; for all things that differ, differ either in kind or in form—in kind if the things do not have their matter in common and if there is no coming to be from one to the other . . . and in form if they have the same kind" (*Met.* 1054^{b}23–30).

Distort (*diastrephein*): Distortion is often of the sort that feelings generally produce because of their involvement with pleasure and pain: (1) "The pleasant and painful do not destroy or distort every sort of supposition (for example, that triangles do or do not contain two right angles) but the ones about what is doable in action" (*NE* 1140^{b}13–16). (2) "Depravity produces distortion and false views about practical starting-points" (1144^{a}34–36). (3) "Spirit distorts [the judgment of] rulers even when they are the best men" (*Pol.* 1287^{a}31–32). That is why to correct these distortions and produce a virtuous mean in our feelings we must investigate "what we ourselves are more inclined toward; for different people are naturally inclined toward different things. This will become known to us from the pleasure and pain that the things bring about in us. And it is in the contrary direction that we must drag ourselves off; for it is by pulling well away from error that we will attain the mean—precisely as people do in rectifying distorted pieces of wood" (*NE* 1109^{b}1–7).

Dithyramb (*dithurambos*): Hymn to the god Dionysus (Bacchus).

Division (*diairesis*): A way of defining what something is by dividing its kind and differences in the way specified at *Met.* 1037^{b}27–1038^{a}20. Specifically Platonic division, however, is often criticized.

Docked (*kolobos*): The adjective *kolobos* means "docked" (as in docking a puppy's tail or docking someone's salary), "curtailed," "stunted," "truncated"—the central idea being that of cutting off a projecting part, typically a non-essential one. None of these English terms fits all the cases Aristotle cites in his discussion of the notion in *Met.* 5.27. "Mutilated" is the traditional translation but suffers the disadvantage of not capturing the central idea: mutilation need not involve the cutting off of a part; cutting off a part need not result in mutilation. Nonetheless, it sometimes gives the correct sense, as at F135. At *SE* 176^{a}40, a question asked *kolobôs* is contrasted with one asked in a perspicuous way.

Dog Days: The sultry days of July and August, so-called because they were associated with the Dog Star (Sirius).

Dokimasia: **Examination**

Dorian: See **Harmonies**

Double Game, Play a (*epamphoterizein*): (1) The verb *epamphoterizein* is used to characterize ambiguous statements (Plato, *Republic* 479c) and to describe things that lie halfway between others. (2) In a related sense, water and air *epamphoterizein* because they have tendencies to move up and to move down (*Ph*. 205^{a}28); some animal kinds do so because they both walk and swim, or walk and fly (*HA* 488^{a}1), while others, like humankind, do so because they are "one-offspring-bearing, few-offspring-bearing, and many-offspring-bearing at times" (*GA* 772^{b}1–2); and some qualities do so due to their nature, because of "going toward the worse or toward the better because of one's habits" (*Pol*. 1332^{b}2–3).

Doulos: **Slave**

Doxa: **Belief**

Dream (*oneirôttein*): "The appearance due to the movement from the perceptual affections, when it occurs during sleep, and insofar as one is sleeping" (*Insomn*. 462^{a}30–31.

Drimus: **Pungent**

Dry (*xêros*): "Things are said to be dry and wet in many ways; for both wet (*hugros*) and moist (*dieros*) are opposed to dry, and, in turn, both dry and solid (*pepêgos*) are opposed to wet; but all these belong to the wet and the dry said in the primary way. For since dry is opposed to moist, and moist is what has alien liquid on its surface, while soaked is what has it to its depths, and dry is what is deprived of it, it is evident that moist will belong to the wet, and the dry that is opposed to it to what is dry in the primary way. Again, wet and solid are opposed in the same way; for wet is what has its own liquid down to its depths (while soaked is what has alien liquid down to its depths), and solid is what is deprived of this, so that these too belong, the one to the dry, the other to the wet" (*GC* 330^{a}12–24). *Hugros* is generally "wet," or "liquid," even when "moist" or "moisture" might seem more natural; and *xêros* as "dry," not "solid."

Duct (*poros*): No English word matches Aristotle's use of *poros* perfectly in every context. But because the notion is an important one it requires consistent handling. Overall "duct" seems to work better than "passages," "pores," "channels," and so on, though these give a more natural reading in some cases. The term occurs rarely in the short psychological works (*Sens*. 438^{b}14, *Somn*. 457^{a}13, 26, ^{b}13, *Juv*. 473^{b}3, 480^{b}16), and only once in *DA* (at 422^{a}3). Nonetheless, the connection of perceptual organs to the heart is firm doctrine there (*Sens*. 439^{a}1–2, *Juv*. 469^{a}2–23) as elsewhere (*PA* 647^{a}24–31, 656^{a}27–29). At *GC* 326^{b}34–327^{a}1 ducts are "veins of affectability, just like [veins of ores] stretching continuously in mines."

Dunamis: See **Capacity**

Dunatos: See **Possible**

Dynasty (*dunasteia*): "The counterpart among the oligarchies of tyranny among the monarchies, and of the democracy we spoke of last among the democracies" (*Pol.* 1292^{b}7–9).

Earth (*gê*): See **Element**

Earth, the: Discussed in *Cael.* 2.13–14.

Echein: **Having**

Eclipse (*ekleipsis*): Defined at *APo.* 90^{a}15–17; explained at 93^{a}29–^{b}14 (also *Cael.* 297^{b}29–30).

Ecstatic (*enthousiastikos*): *Enthousiasmos*, which derives etymologically from *theos* ("god"), is a state similar to the feeling of ecstatic possession experienced by a participant at the orgiastic feasts of Dionysus (Bacchus), and other such gods, at which intoxicating music, like that of Olympus, figured. See *Pol.* 1340^{a}11, ^{b}4, 1342^{a}4.

Education (*paideia*)
Aristotle thinks that education is of paramount political importance (*Pol.* 1310^{a}12–14, 1332^{b}10–11): a community could not really be a city if it did not educate its citizens in virtue (1280^{b}1–8); people are unified and made into a community by means of education (1263^{b}36–37). Yet, in part because the *Politics* is incomplete (see 1326^{b}32–39, 1330^{a}31–33, 1335^{b}2–5, 1336^{b}24–27, 1338^{a}32–34, 1341^{b}19–23), it is difficult to get clear even about the elementary education described there (7.17–8.7). Four stages are discernible in it: (1) The treatment of infants, and their informal training up to the age of 5 is sketchily described at 1336^{a}3–1336^{b}35. (2) From ages 5 to 7, children observe the studies they will later learn for themselves (1336^{b}35–37). (3) From ages 7 to 14, which includes "lighter athletic exercises" (1338^{b}40–42). (4) From ages 14 to 21, this includes (ages 17 to 21) arduous physical training combined with a strict diet (1339^{a}5–7), as well as three years (ages 14 to 17) of "other sorts of learning" (1339^{a}5). But these are not explicitly identified. They could be reading and writing, music, and drawing (1337^{b}24–25). But then the only thing that children would be taught in (3), a period of seven years, is light physical training. This is sufficiently implausible on its own terms (why postpone reading, writing, drawing, and music until age 14?) and a sufficiently large departure from common Greek practice and Plato's recommendations that we would expect Aristotle to acknowledge it as an innovation and defend it carefully. The fact that he does neither of these things suggests that he is in fact intending to follow tradition and include reading, writing, drawing, and music in (3).

But if the "other sorts of learning" are not reading, writing, music, and drawing, what are they? There are a number of possibilities. In *Pol.* 1.11, Aristotle says that a free

person has theoretical knowledge of all of the practical aspects of wealth acquisition (1258^{b}9–11). And in various places, he refers to what he calls a "well-educated person (*pepaideumenos*)." This is someone who studies practically all subjects—including analytics (*Met.* 1005^{b}3–4)—not in order to acquire expert scientific knowledge in all of them (which would be impossible), but in order to become a good judge (*PA* 639^{a}1–6, *Met.* 995^{a}6–14, *NE* 1094^{b}28–1095^{a}2, *EE* 1216^{b}40–1217^{a}10). Generally educated in, e.g., medicine, he is as capable of judging whether or not someone has treated a disease correctly as a doctor is (*Pol.* 1282^{a}3–7). Acquainted with many subjects, methodologies, and areas of study, he knows "what we should and should not seek to have demonstrated" (*Met.* 1006^{a}6–8) and looks for "the degree of exactness in each kind of investigation that the nature of the subject itself allows" (*NE* 1094^{b}23–27).

Because he is able to judge the works and advice of experts, a well-educated person is free from the sort of intellectual enslavement to them that would otherwise be his lot. He knows who is and who is not worth listening to on any matter and so can get good expert advice when he needs it. But he is also free from the inner enslavement that is all too often the lot of the narrow expert, whose imagination is straitjacketed by the one thing he knows too well. For, while he has indeed studied all the "free sciences," he has done so only "up to a point," and not so assiduously or pedantically as to make "thought unleisured and low" (*Pol.* 1337^{b}14–17). Presumably, then, the citizens of the best city, who are all civilized and generally educated men, must be trained in these subjects at some point. If not as part of (3), then later in their lives.

In *Pol.* 8.3, we are promised a discussion of a sort of education that sons should be given "not as something useful or necessary but as something noble and free" (1338^{a}30–34). The promise is unfortunately not fulfilled, but we do nevertheless have some clues to go on as to the nature of these studies. We know that music and drawing are both to be taught in part because they are noble and free and contribute to leisure (1338^{a}21–22, 1338^{b}1–2). But we also know that many other subjects, particularly philosophy (1263^{b}29–40, 1267^{a}10–12, 1334^{a}23) and other theoretical sciences, are crucial to spending one's leisure time well and achieving happiness. Since the end of a city is to enable its citizens to lead the good life and be happy, it must surely educate them in these subjects and sciences (see 8.15).

Finally, there is the vexed question of explicitly ethical or political training and education. Ethical training (in the shape of habituation) must take place before more formal education in ethics and statesmanship (e.g., listening to Aristotle's own lectures on ethics in the Lyceum) can begin (*NE* 1095^{b}4–8). *Pol.* 1336^{a}23–34 suggests that some of this already occurs in (1). Formal ethical education is absolutely required, however, in order to develop practical wisdom (which includes the knowledge of what happiness really is), which all the citizens of the best city must have if they are to rule successfully when their turn comes (*Pol.* 1277^{b}26). Such education presumably takes place after (4), but precisely when and in what form, we can only guess (see *Pol.* 1333^{b}3–5). Moreover, we know that training in rhetoric is very important (*Rh.* 1355^{a}39–^{b}2), suggesting that it too is part of general education. It seems reasonable to conclude, therefore, that some

training in the theoretical sciences must be included in (1)–(4) in addition to ethical habituation, and that some further education in ethics, rhetoric, and perhaps in these sciences too must occur after (4).

Just as important as the content of the education Aristotle advocates is the fact that he explicitly conceives of it not in the traditional Greek way as privately provided (*Pol*. 1337^{a}18–26) but as public education suited to the constitution and provided to citizens by it (1260^{b}15, 1337^{a}14). It is no surprise, therefore, that most of his remarks about the education provided in the best city concern the education of future unconditional citizens, all of whom are, of course, males. It seems certain, nonetheless, that he thinks that public education should also be provided to girls and women (1260^{b}13–20, 1269^{b}12–24, 1335^{b}11–12). But since he thinks that male and female virtues are different (1.13), the education of men and women is also bound to differ substantially.

Egg (*ô[i]on*): "Among the embryos that are complete, what is called an 'egg' is the one from which the animal offspring comes to be, from one part of which comes the starting-point, while the other is nourishment for the offspring" (*HA* 489^{b}6–8). Two-colored eggs have a white part and a yellow part (*ôchron*) or yolk (*lekithos*, *neottos*); single-colored ones have no difference between white and yolk (*GA* 751^{a}31–33).

Egkuklia: **Works in Circulation**

Eidenai: **Know**

Eidôlon: **Image**

Eidos: **Form**

Eikos: **Likelihood**

Einai: **Being**

Einai + dative: **Being for**

Eirôn: **Self-deprecator**

Eisaggelia: **Indictment**

Ekklêsia: **Assembly**

Ekkrisis: See **Secretion**

Ekthesis: **Setting Out**

Elegant (*asteios*): The urban center of a *polis* is the *astu* ("city proper") in contrast to the surrounding countryside. Someone is *asteios*, then, when he is "urbane" and "well educated" rather than *agroikos* ("rustic," "boorish"). On the other hand, someone who is *asteios* is also contrasted with someone who is noble in appearance, and likened to one who is well proportioned (*NE* 1123^{b}7–8). "Elegant" rather than "urbane" seems to better capture the sense.

Elegchos: **Refutation**

Element (*stoicheion*): A *stoicheion* was originally one of a row (*stoichos*) of things and later a letter of the alphabet or an element of any complex whole (Plato, *Theaetetus* 201e). Aristotle uses it in these ways, and to refer to the five primary bodies (earth, water, air, fire, and ether or "primary body") from which all others are composed (*Cael*. 302^{a}15–19). These, however, though called "elements," may not in fact be such, since they are not simple: (1) "Fire . . . and air and each of the others . . . are not simple, but mixed. The simple ones are like these, but not the same as them—for example, if something is like fire, it is fire-form, not fire, and if like air, it is air-form, and likewise in the other cases" (*GC* 330^{b}21–25; also *PA* 649^{a}20–23). (2) "At the center and around the center what is heaviest and coldest is set apart, namely, earth and water. Around these, and continuous with them, are air and what due to custom we call 'fire,' but it is not fire. For fire is excess of hotness and a sort of boiling. But we must understand that of what we call 'air,' the part surrounding the earth is, as it were, wet and hot because it is vaporous and contains exhalations from the earth, while the part above this is already hot and dry. For vapor's nature is wet and cold, that of exhalation hot and dry. And vapor is potentially like water, exhalation potentially like fire" (*Mete*. 340^{b}19–28). (3) In a more special sense, an element is a topic: "I mean the same thing by 'element' and 'topic'; for an element or topic is something into the province of which many enthymemes fall" (*Rh*. 1403^{a}19).

Eleos: **Pity**

Eleutheriotês: **Generosity**

Eleutheros: **Free**

Elleipsis: See **Excess and Deficiency**

Embruon: See **Embryo**

Embryo (*kuêma*): (1) "By [a *kuêma*] I mean the primary mixture of female and male" (*GA* 728^{b}34). The fertilized ovum of live-bearing animals are *kuêmata*, but so too are complete and incomplete eggs (733^{a}24), larvae (758^{a}12, 758^{a}33), fish spawn or roe (741^{a}37), and newborn animal offspring (*HA* 579^{a}21), so that "embryo," which is the usual translation, is no better than an approximation. (2) *Embruon* is "fetus." For *embrua* "necessarily possess heaviness and movement" (*GA* 719^{a}15–16), and so seem to be a later stage in the development of *kuêmata*: "there is a sort of completion even of a *kuêma*" (776^{a}35–^{b}1). But often the two terms are interchangeable.

Empeiria: **Experience**

Empsuchon: **Animate**

Enantion: **Contrary**

Encomium (*egkômion*): "Speech that makes the greatness of virtue apparent" (*Rh*. 1367^{b}26–27).

End (*telos*): (1) "By 'end' we mean not every last thing, but the best one" (*Ph*. 194^{a}32–33). (2) "The best thing and the last thing, for the sake of which all the others [exist], is an end" (*EE* 1219^{a}10–12). (3) "The end—that is, the for-the-sake-of-which—is a last thing" (*Met*. 1021^{b}29–30). (4) "A certain difference . . . appears to exist among ends; for while some are activities, others are works of some sort beyond the activities themselves" (*NE* 1094^{a}3–5).

Endechesthai: **Possible**

Endeixis: **Denunciation**

Endosimon: **Keynote**

Endoxa: **Beliefs, Acceptable**

Endoxos: **Acceptable, Reputable**

Energeia: **Activity**

Enstasis: **Objection**

Entelecheia: **Actuality, Actualization**

Enthumêma: **Enthymeme**

Enthymeme (*enthumêma*): The correlate in rhetoric of a deduction in dialectic (*Rh*. 1356^{b}3–4).

Entoma: **Insects**

Epagôgê: **Induction**

Epainetos: **Praiseworthy**

Epamphoterizein: **Double Game, Play a**

Epic Poetry (*epopoiia*): Defined and distinguished from tragedy at *Po*. 1449^{b}9–20, 1458^{b}15–19.

Epideictic (*epideiktikon*): A speech made on typically ceremonial occasions where someone or something is either praised or blamed.

Epieikeia, *epieikês*: **Decency, Decent**

Epimeleia: **Supervision**

Epistêmê: **Science**

Epistêton: See **Action, Doable in**

Epithumia: **Appetite**

Equal, Fair (*isos*): Equality, as a matter of justice, is discussed at *NE* 5 and, as a political ideal, at *Pol*. 5.1. The important contrast between numerical equality and equality in accord with worth is discussed at *NE* 5.3, *Pol*. 1301^{b}30–35.

Ergon: **Work**

Eristikos: **Contentious**

Erythrinus (*eruthrinos*): Probably the *Serranus anthias* (a sort of sea perch), which is hermaphrodite, with male organs that are hard to discern.

Eschaton: See **End**

Essence (*to ti ên einai*): *To ti ên einai*—roughly, "the what-it-was-to-be"—is a phrase of Aristotle's coinage, of which "essence," from the Latin verb *esse* ("to be") is the standard translation. The imperfect tense *ên* ("was") may—as in the Latin phrase *quod erat demonstrandum* ("which was to be proved")—stem from an original context (such as a Socratic conversation) in which someone is asked to say or define what X is, and concludes by giving his answer in the imperfect tense to signal that he is giving the answer that was asked for. Apart from that, it seems to have no special significance, so we could equally well translate *to ti ên einai* as "the what-it-*is*-to-be." See **Substance**

Essence, Primary: "The primary essence does not have matter; for it is an actuality" (*Met*. 1074^{a}35–36).

Estimable (*timios*): (1) The core sense of *timios* is captured in the remark that ordinary people "are in the habit of saying that those they particularly esteem and love 'have priority'" (*Cat*. 14^{b}5–7). (2) Something is objectively *timios* when—like starting-points and causes—it "is prior by nature" (14^{b}3–5). (3) To say that something is estimable is thus to ascribe a distinct sort of goodness or value to it: "Happiness is included among things both estimable and complete," since, as "the starting-point and cause of goods," it is "something estimable and divine" (*NE* 1102^{a}1–4). (4) "Those things are estimable on which honor is based, and honor follows along with all such things" (†*MM* 1183^{b}23–24).

Ether (*aithêr*): *Aithêr* is the name given by Anaxagoras (*Cael*. 270^{b}24–25) to what Aristotle calls "primary body" (*sôma prôton*), the element that constitutes the heavenly bodies. It is "beyond the ones composed here, more divine and prior to all these" (269^{a}32), and it is both transparent and in eternal circular movement (270^{a}12–^{b}25).

Ethics (*êthikê*): The methodical inquiry into ethics is "a sort of politics" (*NE* 1094^{b}10–11). But while politics' focus is the good of a city—which, like that of an individual (1094^{b}7–8), is happiness—ethics aims to discover (among other things) what happiness is (*Pol*. 1332^{a}3–10).

Ethnos: **Nation**

Ethos: **Habit**

Êthos: **Character**

Eudaimonia: **Happiness**

Euêmeria: Sometimes "prosperity" (*NE* 1178^{b}33, *Pol*. 1322^{b}38), sometimes "joy" (*Pol*. 1278^{b}29, 1324^{a}38).

Eugeneia: **Breeding, Good**

Eulogos: **Reasonable**

Eunomia: **Good Legislative Order**

Euphuês: **Naturally Well-disposed**

Eupraxia: See **Happiness**

Euthuna: **Inspection**

Evident (*phaneron*, *phainesthai*): See **Appear**

Exact, Exactness (*akribês*, *akribeia*): "One science is more exact than another, and prior to it, if it is both of the that and the why, and not of the that separately from the why; and if it does not have an underlying subject, while the other does have an underlying subject (as, for example, arithmetic is more exact than harmonics); and if it makes fewer assumptions, while the other depends on some additional assumption (for example, arithmetic is more exact than geometry)" (*APo*. 87^{a}31–35). So (1) the most exact version or formulation of a science is the most explanatory one—the one consisting of demonstrations from starting-points; (2) of two sciences, formulated in the most exact way, one is more exact than the other if it demonstrates facts that the other deals with but does not demonstrate. Because a natural science has to posit sublunary matter in addition to such starting-points (*Met*. 995^{a}14–16), the strictly theoretical sciences (theology, astronomy, and mathematics) are more exact than it. Hence it is among these that the most exact one will be found, and it will be the one that explains what the others treat as a fact or undemonstrated posit. *Top*. 111^{a}8–9 offers "perspicuous" as an equivalent.

Examination (*dokimasia*): The process in Athens of determining whether, for example, someone should be admitted to citizenship, or was eligible for military service, or to hold the office to which he had been elected (*Ath*. 42.2, 55.2–3).

Examinational Arguments (*peirastikoi logoi*): "Those that deduce from things that seem so to the answerer and that it is necessary for the one to know who pretends to possess the relevant science" (*SE* 165^{b}4–7).

Examinational Craft (*peirastikê*): "A sort of dialectic and has in view not the person who knows, but the one who is ignorant and pretends to know" (*SE* 171^{b}4–6).

Excellent (*spoudaios*): Often *spoudaios* is a synonym of *agathos* ("good"), but sometimes, when predicated of things, it means "serious" (*NE* 1177^{a}2).

Excess and Deficiency (*huperochê kai elleipsis*): See **More and the Less, the**

Exchange, Craft of (*metablêtikê*): The three parts of the craft of exchange are trading (whose sub-parts are ship owning, transport, and marketing), moneylending, and wage-earning (*Pol*. 1258^{b}20–27). The sorts of exchange that involve bartering surplus goods for other needed goods are natural and are not a part of the craft of wealth acquisition (1257^{a}14–30). The other sorts are parts of the craft of commerce.

Exchange of Property Trial (*antidosis*): A person A assigned a public service could argue that another B was better able to pay its cost. He challenged B in court either to carry out the service in his place, if B admitted he was richer, or to exchange his wealth for A's, and then A would carry it out.

Exhalation (*anathumiasis*): (1) "The exhalations are two, one vaporous and one smoky" (*Mete*. 378^{a}18–19). (2) "The smoky exhalation . . . is common to air and earth" (*Sens*. 443^{a}27–28). The term is also used generically to refer to both dry and wet exhalations (*Mete*. 341^{b}6–10), and for the dry exhalation alone (342^{a}4).

Exist: See **Be**

Exôterikoi logoi: **External Accounts**

Experience (*empeiria*): *Empeiria* is not what we mean by experience: for us experience gives rise to memory; for Aristotle memory gives rise to *empeiria*. Suppose A perceives that when X_1 is sick with a fever giving him honey-water is followed by a reduction in fever (*Met.* 1027^{a}23–24) and that A retains this connection in his memory. Then he perceives that giving honey-water to X_2, X_3, . . . X_n is also followed by a reduction in fever. A also retains these connections in his memory. When as a result of retaining them A associates drinking honey-water with fever reduction, he has "a single experience," since "memories that are many in number constitute a single experience" (*APo*. 100^{a}5–6).

External Accounts (*exôterikoi logoi*): *Exôterikoi logoi* are mentioned at *Ph*. 217^{b}31, *Met*. 1076^{a}28, *NE* 1102^{a}26, 1140^{a}2, *EE* 1217^{b}24, 1218^{b}32, *Pol*. 1278^{b}31–32, 1323^{a}21, F38. *Cael*. 279^{a}30 mentions "the philosophical studies in circulation" and *DA* 407^{b}30 "the common accounts." The references seem to be to works written by Aristotle himself and "in circulation" (*NE* 1096^{a}3) outside the Lyceum, or to accounts or arguments, not necessarily by him, that are generally known. Whatever the precise reference it must be to things familiar to the relevant audience.

Faction (*stasis*): Internal political conflict, extending all the way from political tensions to outright civil war, typically occurring between rich (aristocrats, oligarchs) and poor (democrats), which can be severe enough to result in the overthrow or modification of the constitution.

Fallacy (*paralogismos*): Fallacies generally are sophistical refutations (*SE* 164^{a}20–21), which are based on acceptable beliefs or what appear to be such. Those which "proceed from things proper to a given science" (*Top*. 101^{a}6–7) are thus exceptions requiring special treatment. See *SE* 171^{b}11–22, 171^{b}34–172^{a}11.

False, Falsehood: See **Truth**

Fat (*pimelê*): Concocted blood (*PA* 651^{b}7–8). Discussed in *HA* 3.17–18, *PA* 2.5. See **Suet**

Fatherhood, Science of (*patrikê*): Discussed in *Pol*. 1.12. Called "procreative science" at 1253^{b}8–12.

Feeling (*pathos*): "Appetite, anger, fear, confidence, envy, enjoyment, love, hatred, longing, jealousy, pity, and, in general, whatever is accompanied by pleasure and pain" (*NE* 1105^{b}21–23). See **Affection**

Fellow Feelings for Human Beings (*philanthrôpia*): (1) A tragedy is *philanthrôpos* if it appeals to our fellow feelings for humans (*Po.* 1452^{b}38, 1456^{a}21). (2) In a more general sense, woodcocks are *philanthrôpos* in that they are easily domesticated (*HA* 617^{b}26), a person is *philanthrôpos* in that he is "humane" (*Ath*. 16.8), and an action that is done *philanthrôpôs* is done cordially (*Ath*. 18.3).

Female (*thêlu*): See **Male and Female**

Fetus (*embruon*): See **Embryo**

Fig Juice (*hopos*): The acidic juice of the fig tree, used like rennet to curdle milk in making cheese.

Figure, Configuration (*schêma*): (1) A geometrical figure (*APo*. 86^{a}1, *SE* 168^{b}1, *DA* 414^{b}20, *Met*. 1024^{b}1). (2) A figure in the way that we would speak of a "political figure" (*Met*. 1004^{b}18). (3) The shape (*PA* 640^{b}29, 641^{a}20) or form (640^{b}27, *Met*. 1029^{a}4) of something as opposed to its matter. (4) A figure of predication or category (1016^{b}34). (5) A syllogistic figure (*APr*. 26^{a}13, *APo*. 73^{a}14). (6) A style of speech (*SE* 166^{b}10). In *APr*. *homioschêmones* is "same in form" (27^{b}11, 34, 32^{b}37, 33^{a}37, 36^{a}7).

Finger (*daktulos*): The word *daktulos* also means "toe," and so is sometimes "digit," when a neutral term is needed (*PA* 690^{a}30).

Fire (*pur*): See **Element**

First Philosophy: See **Philosophy**

Fishing Frog (*batrachos*): Probably *Lophius piscatorius*. The popular names are "fishing frog," "angler fish," "sea devil," and "monkfish." They are teleostean fishes, not cartilaginous ones.

Fitting (*prosêkon*): What is fitting is what is appropriate, proper, or seemly—especially, perhaps in the sense of what it belongs to something to do because it is the sort of thing it is.

Flyer (*ptêtikos*): The adjective *ptêtikos*, like "flyer," applies either to what can fly or to what can fly well. Its negation, however, applies to what is (largely) incapable of flying (and so is a "non-flyer") (*HA* 558^{b}31).

Foolishness (*aphrosunê*): At *EE* 1234^{a}33–35, a connection is made between *aphrosunê* and *sôphrosunê* ("temperance"): "a sense of shame contributes to temperance (which is why people define temperance as being included in this kind); and the truthful and false are respectively wise and foolish (*aphrôn*)." Since we call temperance by this name "as being what preserves practical wisdom" (*NE* 1140^{b}11–12), and practical wisdom is the virtue of the rationally calculative (or deliberative) part of the soul (1139^{a}15–17, 1140^{a}25–28), *aphrosunê*, when not a result of nature, disease, or morbid madness, seems in particular to be the sort of foolishness that consists in a lack of practical wisdom.

Foot (*pous*): "A part [of the body], connected with a point on the ground, capable of causing movement with respect to place" (*IA* 706^{a}31–32).

Force (*bia*): (1) "'By force' and 'contrary to nature' are the same thing" (*Cael*. 300^{a}23). (2) "What is forced [is] contrary to impulse" (*Met*. 1072^{b}12; also 1015^{b}15). (3) In the case of actions "what is forced is what has a starting-point that comes from outside" (*NE* 1110^{a}1; also †*MM* 1188^{b}12–14).

Form (*eidos, idea*): (1) The *eidos* of something is often the class it belongs to (*huparchein*) or participates in (*metechein*), or the universal under which it falls (*hupo*) or that is predicated (*katêgorein*) of it. (2) When an *eidos* is contrasted with a *genos* it belongs to the *genos* and figures with it and a difference (*diaphora*) in the definition of the essence of the things the *eidos* belongs to. (3) When contrasted with matter, *eidos* is again related to essence: "By *eidos* I mean the essence of each thing and the primary substance" (*Met*. 1032^{b}1–2). (4) In senses (2) and (3) *eidos* is actuality or activity (*DA* 412^{a}10, 414^{a}18, *Met*. 1038^{b}6, 1042^{b}10), a this something (1017^{b}25–26, 1029^{a}28–29, 1042^{a}29, 1049^{a}35), and—in some cases—separable from matter (1037^{a}33–^{b}2, 1042^{a}31). (5) One sort of *eidos* is perceptible (*DA* 424^{a}18), another intelligible (429^{a}13–15); the former is sometimes "appearance" (*HA* 504^{a}13, 505^{b}13, 521^{a}33, *NE* 1167^{a}5), just as *idea* is sometimes "visible form" (*PA* 656^{a}3). (6) Occasionally *eidos* and *genos* are pretty much equivalent in meaning, like the corresponding English terms "form" and "kind."

Form, Platonic (*eidos*, *idea*): The origin and nature of the Platonic theory of Forms is discussed at *Met*. 1.6, 1078^{b}12–32, 1086^{a}31–^{b}13. The theory is criticized at *APo*. 77^{a}5–7, 83^{a}32–35, *Top*. 178^{b}36–179^{a}10, *Met*. 1.9, 7.6, 1033^{b}19–29, 7.13–15, 1045^{a}15–20, 13.4–5, 10, *NE* 1.6, *EE* 1.8. A target of criticism is often the separability of the Forms and the resulting confusion of universality and particularity (*Met*. 997^{b}8–12, 1040^{b}27–34) and susceptibility to the "third man" (1038^{b}34–1039^{a}3).

Form, Transmission of

According to Aristotle we find in nature an apparently continuous scale of beings, in which animate beings—beings with souls—differ only very slightly from inanimate ones in their level of formation (*HA* 588^{b}4–10). The sublunary elements aside, the simplest beings on this scale are uniform stuffs, such as wood, olive oil, flesh, and bone, whose parts have the same account as the whole (*GC* 314^{a}20, 328^{a}9–12). These are constituted out of the elements—earth, water, fire, air—in some ratio, when the active capacities (hot, cold) in the elements master the corresponding passive ones (dry, wet) (*Mete.* 378^{b}26–379^{a}1). The fundamental variety of this sort of mastery is concoction, which is "determined by the heat in its nature" (379^{b}34–35). Natural heat is thus formative heat—the thing in nature partly responsible for the coming to be and preservation of matter-form compounds.

Uniform stuffs, as minimally formed, have a low level of such heat. As formative heat is added, so that stuffs come to constitute the structural parts of animals (such as hands and eyes), and these to constitute whole animals of different degrees of complexity, natural heat increases: "the more complete ones are those that are hotter in nature and wetter and not earthen" (*GA* 732^{b}31–32). Such animals more completely pass on their form to offspring (733^{a}33–^{b}2). Since human beings are the most complete or most perfect animals (737^{b}26–27), they are also the hottest and most estimable (*Juv.* 477^{a}13–25). Although male and female human beings both have formative heat, its level is not the same in each. This is revealed by the different roles played by their respective spermatic products—seed (*sperma*) or semen (*gonê*) in the case of males, menses (*katamênia*), or rather the spermatic residue in them, in that of females—in reproduction: "the male provides both the form and the starting-point of movement, while the female provides the body, that is, the matter" (*GA* 729^{a}9–11).

What seed does to menses to form them into a fetus is likened to what a carpenter does to wood to make it into a piece of furniture (*GA* 730^{b}11–23), so that in the way that the movement of the carpenter's hands has its starting-point in the form or essence of the product present in his soul, the movement in the seed has its starting-point in a form—namely, that of the male progenitor. Hence the very same formal constituents exemplified as potentialities in his form are exemplified as movements in his seed, guaranteeing that these movements are (at least to begin with) formally identical to the potentialities that transmit them (*GA* 737^{a}20–22). Were this not so, their transmission to seed could not result in the transmission of the male's form to the offspring.

What enables the transmission of such movements to seed is, first, that they are present in the male's blood—where, encoded in formative heat, they are responsible for the preservation of his form—and, second, that seed itself is a very concentrated or concocted blood product (*GA* 726^{b}1–18). When the male's formal movements are transmitted by concoction to menses, therefore, they first initiate the formation of the fetal heart. Once the heart is formed, the fetus then grows automatically, drawing its nourishment from its mother through the umbilicus, and in the process transmitting formative movements via the blood to the other developing parts (735^{a}12–26).

Menses, however, also include a type of seed—"seed that is not pure but needs work" (*GA* 728^{a}26–27). For a female's formative heat is cooler than a male's, and so cannot complete the final stage of forming or concocting menses into pure seed (728^{a}18–21). In species without "separated" males, however, this may not be so (741^{a}32–38). Nonetheless, even in species where males and females are clearly distinguished, a female can concoct her menses (or the spermatic residue in it) to within that last stage of becoming pure seed, so that for each actual movement in male seed, there is a corresponding potential movement stemming from the female form in them (768^{a}11–14). While menses have the potential to move in such a way as to become a fetus, therefore, they cannot do so until they are set moving by male seed, since "in the things that come to be by nature or by craft, what is potentially such-and-such comes to be due to what is actually such-and-such" (734^{a}29–31). Equally well, of course, without menses to move, no new animal is generated either.

Just which movements will underlie the offspring's form—whether it will be, e.g., male or female—depends on the interaction between the movements in the male seed and the potential movements in the menses (*GA* 768^{b}5–12). If a male movement is transmitted successfully to the menses, the offspring will have the corresponding component of the male form. If it fails to be transmitted, it may be wholly resisted, in which case it is replaced by the opposing movement in the menses, or resisted to a lesser degree, with different consequences in each case (768^{a}7–9, 768^{b}7–8). The difference, then, between male *gonê* (always "semen") or *sperma* (always "seed") and the seed (or spermatic residue) in female menses is in one way quite small: they both encode more or less the same genetic information, as we would say. But in another way it is quite large: only male semen contains that information as actual movements, making it "the first thing containing a starting-point of generation" (724^{b}12–14) (leaving aside possible species in which female seed also contains it). The question is, How does the semen encode this information?

Semen, as we now know, is made up of individual sperms, each viable one of which is in principle capable of fertilizing a female ovum. Aristotle's view is quite different. For him the semen ejaculated is the fertilizing agent, not its sub-parts, and its viability, to call it that, depends on the level of formative or soul-producing heat in it relative to the quantity of female menses that it must work up (*GA* 767^{a}13–23). Nonetheless, if the menses is not to be uniformly concocted, but rather differentially so, in the way requisite for stepwise embryonic development, in which first the fetal heart is formed, then the parts around the head, and so on, the semen too, as Aristotle recognizes, must be "somehow divided into parts" (726^{b}5–6). Nothing is said explicitly about how this division actually takes place. But since semen is foamy, and foam contains bubbles, it is likely that the surrounding membranes of these are what mark the divisions, and encapsulate the formative heat in them (736^{a}13–18). It seems, then, that we should think of the male semen as somehow divided into bubbles, with different ones embodying the different movements needed to form the different parts of the embryo, and to endow them in turn with the formative heat needed for their growth and preservation. That is why we hear about "the proper heat present in each part" (784^{a}35, 786^{a}20).

While seed, as a concocted blood product, is a very purified type of nourishment, its natural heat, in which its formative movements are encoded, is of a quite special sort: "within the seed of everything there is present precisely that which makes the seeds be fertile, the so-called hot. This is not fire or that sort of capacity, but the breath enclosed within the seed and within the foamy part—that is, the nature in the breath, which is an analog of the element belonging to the stars" (*GA* 736^{b}33–737^{a}1). Characterized as "innate (*sumphuton*)," because it is not drawn in from outside but produced and maintained inside the body, it is the sort of breath that plays a fundamental role in nourishment and reproduction (741^{b}37–742^{a}16). It is distinguished from air and what we think of as breath most explicitly in the spurious *De Mundo*: "But something is said to be breath in another way when it is the ensouled and fertile substance in plants and animals and which pervades all things" (394^{b}9–11). The reproductive system, indeed, is in many ways simply a means of transmitting the form-preserving digestive system (of which blood and the heart are parts) into new matter, thereby initiating the formation of a new self-maintaining creature. That is why both functions are assigned to the *threptikon* or nutritive part of the soul (*DA* 416^{a}19, 416^{b}11–12).

Although many natural beings (e.g., ones we think of as inanimate) do not preserve their form by means of nourishment, or transmit it by means of sexual reproduction, breath has a fundamental role to play in their existence too: "Animals and plants come to be in earth and in liquid because in earth there is water present and in water breath, and in all breath there is soul-involving heat, so that in a certain way all things are full of soul" (*GA* 762^{a}18–21). For "just as some things have many uses in the crafts, as in blacksmithing are the hammer and the anvil, so too does breath in those composed by nature" (789^{b}9–12).

For-the-sake-of-Which, the (*to hou heneka*): (1) "The good or the for-the-sake-of-which" is one of the "primary starting-points and causes" (*Met*. 982^{b}9–10). (2) "The for-the-sake-of-which is an end, and the sort of end that is not for the sake of other things, but rather other things are for its sake" (994^{b}9–10). (3) "In the case of a house the source of the movement is the craft or the builder, the for-the-sake-of-which is the work, the matter is earth and stones, and the form is the account" (996^{b}6–8). (4) "The end—that is, the for-the-sake-of-which—is a last thing" (1021^{b}29–30). (5) "The for-the-sake-of-which is found in things that come about by nature or as a result of thought" (1065^{a}26–27). (6) "That the for-the-sake-of-which does exist among the immovable things is made clear by a distinction; for the for-the-sake-of-which is both for something and of something, and of these the one is moved and the other is not. And it produces movement insofar as it is loved, while it is by being moved that the other things move" (1072^{b}1–4). (7) "The what-it-is and the for-the-sake-of-which are one" (*Ph*. 198^{a}25–26). (8) "Nature is a cause, that is, one in the way that the for-the-sake-of-which is a cause" (199^{b}33). (9) "The for-the-sake-of-which lies in the account" (200^{a}14–15). (10) "The for-the-sake-of-which . . . is the cause of the matter, not the matter of the end. And the end is the for-the-sake-of-which and the starting-point springing from the definition and the account" (200^{a}33–35).

Free, Freedom (*eleutheros*, *eleutheria*): A free person is, in the first instance, someone who is not a slave. In this sense, the farmer citizens of a democracy are free people. But a farmer must work in order to get the necessities of life—he is not a person of leisure. So there is another sense in which he is not free. A person who is free in this second sense has distinctive character traits, education, and outlook. Unlike a slavish or unrefined person, he is not obsessed with practical or useful things (*Pol.* 1333^{b}9–10, 1338^{b}2–4), but is rather the sort of person "whose possessions are more noble and profitless than profitable and beneficial; for that is more characteristic of a self-sufficient person" (*NE* 1125^{a}11–12). The fact that he is well educated gives him a broad perspective on the world, rather than a narrow-minded or overly specialized one. Hence he is able to judge or assess the credibility and appropriateness of discussions belonging to different professions and disciplines in which he is not himself an expert, so as to be able to choose competent advisors when he needs them. Only this sort of free person can have practical wisdom and the virtues of character, so that he alone has what it takes to be an unconditional citizen in the best sort of city (*Pol.* 1329^{a}2–17). Since that city ensures that he has the resources needed for leisure (1329^{a}17–26), he does not need to work for a living, and so does not "live in dependence on others," which is another important mark of being free (*Rh.* 1367^{a}32). The art and music he enjoys, and the use he makes of his leisure, further distinguish him from those who are unrefined or uncivilized (*Pol.* 1334^{a}11–40, 1342^{a}19–32, *Po.* 1461^{b}26–1462^{a}4). But even such a citizen is often under the control of others, whom he must obey, so that there are often substantial limitations on his freedom or self-determination too.

Freeze (*pêgnunai*): See **Solidify**

Friend, Friendship (*philos*, *philia*): Generally speaking, *philia*, usually "friendship," should be understood to involve friendliness, since *philia* is a feeling (*EE* 1221^{a}7). This is especially clear in *Rh.* 2.4, which is devoted to friendliness and enmity. Translating the verb *philein* as "being friendly," however, misses the action focus of the verb, while "love," though it loses the common root of *philia* and *philein*, preserves it. Love has three proper objects: "good, pleasant, or useful" (*NE* 1155b19). As a result, friendship too is of three sorts: utility friendship, in which the friends are friends because they are useful to each other; pleasure friendship, in which the friends are friends because they give each other pleasure, because they enjoy each other; and virtue friendship, in which the friends are friends because of their virtue (*EE* 1236a13–15). And in each of these the degree of love should be proportional to the corresponding value: "people always think it fitting for the superior—whether in utility, in pleasure, or in accord with virtue—to love less or not at all" (1239a10–11). What makes utility friendship and pleasure friendship lesser sorts of friendship is that they do not involve loving the other person for his own sake, or because of himself and his intrinsic excellence, but because of something else—utility in the one case, pleasure in the other. As a result, these friendships are unstable, since when the other person ceases to be useful or a source of pleasure, the friendship ceases (1237b9–1238a10). The major discussions are *NE* 8–9, *EE* 7.

Gallbladder (*cholê*): Focally discussed in *PA* 4.2. *Cholê* refers both to what we call the "gallbladder" and to what we call "bile" (*HA* 487^{a}4). Context makes one a more natural translation than the other, but no distinction between the two should be assumed, in part because it is not clear (*PA* 677^{a}11–12) whether *cholê* is a residue (which would need to be in a vessel of some sort), a colliquescence (which would not), or a humor (677^{b}4).

Gampsônux: **Crook-taloned**

Generation (*genesis*): See **Coming to Be**

Generosity (*eleutheriotês*): The focal discussion is in *NE* 4.1, *EE* 3.4. Its contrary is ungenerosity (*aneleutheria*).

Gennaios: See **Breeding, Good**

Genos: **Kind**

Get More, One Who Tries to (*pleonektikos*): The verb *pleonektein* means to "get or have more," usually in the sense of more than one's fair share, although it is possible to get more in a just way: "they see others, some justly and some unjustly, getting more of these" (*Pol.* 1302^{b}1–2). The corresponding disposition, or character trait, is often greed (*pleonexia*), which, even if not always a vice, has a substantial potential to lead to vicious action.

Gignesthai: **Come to Be**

Gignôskein: **Know**

Ginnos: **Ginnus**

Ginnus (*ginnos*): A ginnus (plural: "ginni") is a "deformed mule" (*GA* 748^{b}34), the offspring of a mule and a mare (*HA* 577^{b}21); an *innos* seems to be the same thing.

Giving and Getting (*dosis kai lêpsis*): *Dosis* and *lêpsis* do not mean quite what we mean by giving and getting. For *lêpsis* does not mean getting wealth or money in exchange for something or by producing it, as a farmer or shoemaker might. That is why someone can "get" wealth or money from "his own possessions" (*NE* 1120^{b}1). Similarly, spending (*dapanê*) is included under *dosis* (1121^{a}12), because it is the absolute alienation of wealth, not the exchange of it for something of equal or comparable value. Someone who gives a bookseller $20 in return for a book has not "spent" anything, since his wealth remains unchanged by the transaction: he could return the book and get his $20 back. *Dosis* and *lêpsis* are not commercial activities, then, so much as they are social ones, like our gift giving and gift getting. That is why, when it is asked whether it belongs to "the generous person also to acquire and provide himself with money," the answer is "Surely not! For such things do not belong to any other virtue either. For it does not belong to courage to make weapons, but rather to something else, whereas it does belong to it, when it is has got these, to make correct use of them" (†*MM* 1192^{a}16–18). Acquiring and accumulating wealth is the work of the craft of wealth acquisition, which

is discussed in *Pol*. 1.3–4 and 1.8–11; 1.11 discusses the parts of it that a free person should know.

Glischros: **Viscous**

Gnômê: **Maxim, Consideration**

Gnomon: A device, like a carpenter's set square, used by the Pythagoreans in constructing the numbers. The one is both odd and even (*Met*. 986^{a}20). It is represented by ●, when odd, and by ●●, when even. Enclose ● with a gnomon (represented by lines). This gives Fig.1 below. Now enclose ●● with a gnomon. This gives Fig. 2.

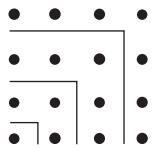

Fig. 1

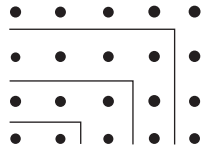

Fig. 2

In Fig. 1 a series of squares (square or even numbers) is generated; in Fig. 2 a series of rectangles (rectangular or odd numbers). The successive square or even numbers generated from ● (the one taken as odd) are all similar (= n^2). The successive rectangular or odd numbers generated from ●● are all dissimilar, since the ratio n:n + 1 is different for all values of n.

God (*theos*): Aristotle recognizes the existence of a number of different divine beings or gods, among whom he distinguishes a primary god, usually referred to as *ho theos* ("the god"), which is the one referred to as the immovable mover in *Ph*. 8.10 and more fully discussed together with the other divine beings in *Met*. 12.7–10. Exclusively a self-contemplating being (*Met*. 1074^{b}34–35), not one who engages in any world-making, he is nonetheless said to "make nothing pointlessly" (*Cael*. 271^{a}33). This raises a problem analogous to one that we meet in *NE* 10, where we are told that "the gods exercise a sort of supervision over human affairs" (1179^{a}24–25). For the gods in question also live exclusively contemplative lives (1178^{b}21), so that whatever supervision they exercise must be of a somewhat special sort. Aristotle does not tell us what it is, but his identification of these gods with the heavenly spheres (*Met*. 1074^{a}38–^{b}14) suggests an answer. For the orderly revolutions of these spheres govern the seasons as well as the cycles of fertility and infertility of land and animals (*GA* 778^{a}4–9). Hence they confer benefits on all beings, but especially on those wise people who, through study of the heavens, learn about these cycles and adjust their lives accordingly. Something similar is presumably true of the primary god, since he is, as the immovable mover of the heavenly spheres, responsible for that order (*Met*. 12.10).

Gonê: See **Seed**

Gonos: **Seed, a**

Good (*agathos*)
A good is "whatever is choiceworthy for its own sake; or that for whose sake we choose something else; or what all things aim at, or all that have perception or understanding, or would aim at if they got understanding" (*Rh*. 1362^{a}21–24). A *good X* is one that possesses the virtues or excellences that enable it to complete the work characteristic and definitive of X's (1097^{b}24–1098^{a}20). *The* good is what is choiceworthy for its own sake only and not for the sake of something else. The good for human beings—the human good—is happiness, while other things aimed at are good to the degree that they promote happiness (*NE* 1152^{b}1–2).

Aristotle divides goods of the latter sort into three sorts: external goods (also called resources or goods of luck), goods of the soul, and goods of the body (*NE* 1098^{b}12–16, *Pol*. 1323^{a}25–26). External goods are usually those that are external to the soul (*Pol*. 1323^{b}7–8), although sometimes goods relating to the body are also classed as internal goods (*Rh*. 1360^{b}26–27). Goods of the soul are states (the virtues) and the activities that are in accord with them, such as doing well in action (*eupraxia*) or happiness. External goods and goods of the body, on the other hand, are capacities or tools that the virtuous person uses to achieve good ends, and the vicious bad ones (*Pol*. 1323^{b}7–12).

Although external goods, unlike goods of the soul, are the result of luck (*Pol*. 1323^{b}27–29), the sphere of luck can be reduced by craft and science, so that many external goods admit of at least limited human control (*NE* 1140^{a}17–20, *Met*. 981^{a}1–5). Some external goods—such as money, honors, and bodily pleasure—are fought over or competed for, while others—such as friends, beauty, or good breeding—are not (*NE* 1169^{a}20–21). The former are the area of focus for many of the virtues of character.

"Good is said of things in as many ways as being" (*NE* 1096^{a}23–24), so that there is no single science of the good. When contrasted with the bad, "the good is simple, while the bad is multiform" (*EE* 1239^{b}12; also *NE* 1106^{b}35).

Good Legislative Order (*eunomia*): *Eunomia* is connected with political virtue (*Pol*. 1280^{b}6), and identified with good order (*eutaxia*) (1326^{a}30–31).

Gourmet Dish (*opson*): In Aristotle's works an *opson* is usually an expensive or elaborate dinner dish cooked in an expert way, but it can also be a relish or small quantity of savory food, such as cheese or olives, served as an accompaniment to bread or another staple.

Governing Body (*politeuma*): **Constitution**

Graphê: **Writ**

Growth and Withering (*auxêsis kai phthisis*): Focally discussed in *GC* 1.5. More generally, "increase and decrease."

Grub (*schadôn*): In bees and wasps (*HA* 555^{a}8) a grub is a larva at a later stage of development, with wings, feet, and a head (554^{a}29, ^{b}3).

Guest-Friend (*xenos*): Guest-friendship (*xenikê philia*) was a ritualized form of pseudo-kinship (typically) between men of equal social status but belonging to different social units (such as Athens and Sparta), involving a variety of forms of mutual support, including exchange of valuable resources (gifts, troops) and services (a home away from home, paying a ransom). The relationship, like true kinship, was perpetual, descending from fathers to sons, so that, e.g., a *xenos* was expected to show protective concern for the son of his *xenos*, including acting as his substitute father if his real father died.

Gullet (*stomachos*): Another name for the esophagus (*HA* 495^{a}18–20).

Gumnastikê: **Physical Training**

Habit (*ethos*): (1) "Things that occur by habit are whatever things people do due to having done them often" (*Rh.* 1369^{b}6–7). (2) "The virtues . . . are brought to completion through habit" (*NE* 1103^{a}24–26). (3) "Legislators make citizens good by habituating them" (1103^{b}3–4).

Habituation (*ethismos*): A process, typically involving pleasure (reward) and pain (punishment), by which we acquire a habit that is at once cognitive (as in the case of induction) and conative, because what we experience as pleasurable we tend to desire and pursue, and what we experience as painful we tend to be averse to and avoid (*DA* 431^{a}8–^{b}12, *NE* 1114^{a}31–^{b}3, 1119^{a}25–27, *Pol.* 1340^{a}23–28).

Haima: **Blood**

Happiness (*eudaimonia*)

The "work of a human being is activity of the soul in accord with reason or not without reason" (*NE* 1098^{a}13–14); human virtue is what enables that work to be completed well (1098^{a}15). As a result, the human good, which is happiness (1097^{b}22), "turns out to be activity of the soul in accord with virtue" (1098^{a}15–16) or "doing well in action (*eupraxia*) involving virtue" (*Rh.* 1360^{b}14). But if there are more virtues than one, the action or activity must be "in accord with the best and most complete" (*NE* 1098^{a}17–18). Moreover, since a few such actions or activities are not enough to make a whole life happy, the life itself must be complete, or "lacking in nothing" (1097^{b}15). It thus requires a good supply of the external goods necessary for a life of virtuous action (1101^{a}14–21).

Our understanding is the divine element in us, and the one with which we are most to be identified (*NE* 1178^{a}2–8). Its work (contemplation) is, therefore, the human work par excellence (F90 42.5–43.25), and its activity is the best sort of happiness when brought to completion in accord with theoretical wisdom, which is the best and most complete virtue (*NE* 1177^{b}16–26).

But a human being is a political animal. He needs family, friends, fellow citizens, and other external goods if he is to be able to contemplate, and cannot survive on a

diet of contemplation alone, since his nature, unlike a god's, is not self-sufficient for it (*NE* 1178^{b}33–1179^{a}9). Insofar as he is human, therefore, he will deliberately choose to do actions that are in accord with practical wisdom and the virtues of character. And the life consisting in such actions, even if no better sort of happiness is thereby furthered, is "happiest, but in a secondary way . . . for the activities in accord with it are [merely] human" (1178^{a}9–10).

Practical wisdom and the virtues of character would not be what they are, however, if they did not aim to further the best sort of happiness (*NE* 1145^{a}6–11). The life consisting of unleisured practical political activity in accord with practical wisdom and the virtues of character is the altogether happiest one, when—because it is led in a city with the best constitution, well situated and provisioned with external goods—it succeeds in achieving the best sort of happiness for its possessor. This complex life—part practical, part contemplative—is the best human life that practical wisdom, which is the best sort of practical knowledge, can arrange.

Hard, Soft (*sklêron*, *malakon*): "Hard is that whose surface cannot be pressed into itself; soft is that whose surface can be pressed in, but not by being replaced; for water is not soft; for its surface is not pressed downward by pressure, but is replaced. Something is unconditionally hard or unconditionally soft if it is unconditionally like that, while it is so in relation to something else if it is like that in relation to it" (*Mete*. 382^{a}11–16).

Hard-shelled (*ostrakodermos*): Hard-shelled animals "have their fleshy part inside and their solid part—which is shatterable and breakable, but not receptive of impressions—outside" (*HA* 523^{b}9–11). Literally, "potshard-skins."

Hard-scaled (*pholidôtos*): E.g., the crocodile.

Hard-skinned: (*sklêrodermos*): E.g., the crayfishes.

Harmonies (*harmoniai*): d = ditone (the interval of a major third); q = quarter-tone; s = semitone; t = tone:

Mixolydian:	q, q, d, q, q, d, t
Dorian:	q, q, d, t, q, q, d
Phrygian:	d, q, q, d, t, q, q

These can be represented as two tetrachords, each of the form q, q, d, together with a tone that disjoins them.

Harsh: *austêros*

Having (*echein*): The category of "having on" (*Cat*. 2^{a}3), but also the cross-categorial modes of having discussed in *Cat*. 15.

Hearth, Communal (*hestia*): A city's communal hearth derived from the hearth in a king's palace, which was of both practical and magical or religious significance.

Heat, Hot (*thermotês, thermos*): The hot, for Aristotle, is "what aggregates things of the same kind" (*GC* 329^{b}26–27). Felt heat, by contrast, which is what we usually mean by "heat," is an affective perceptual quality (*Cat*. 9^{b}2–9). See **Form, Transmission of**

Heaven (*ouranos*): "In one way, then, we say that the substance belonging to the outermost revolution of the universe is heaven, or the natural body that is on the outermost circumference of the universe; for more than anything else it is the last upper region that we usually call 'heaven,' the one in which we say that everything divine also has its seat. In another way, it is the body that is continuous with the outermost circumference of the universe, in which we find the moon, the sun, and some of the stars; for we say that these bodies too are in the heaven. Further, we say that the body that is encompassed by the outermost circumference is heaven; for we are accustomed to say that the whole and the universe is heaven. Something is said to be heaven is, then, in three ways. The whole encompassed by the outermost circumference is of necessity composed of the totality of natural and perceptible body, because there neither is nor can be any body outside the heaven" (*Cael*. 278^{b}11–21). This whole and its parts are classed as substances at 298^{a}30–31.

Heavy, Light (*barus, kouphos*): See **Weight**

Hê(i): **Insofar as, Qua**

Hekôn: **Voluntary**

Hêmeros: When it is the contrary of *agrios* ("wild"), *hêmeros* is "tame," even when "domestic" might be more natural. It can also mean "gentle," "peaceful," and the like.

Hen: **One**

Hepsêsis: **Boiling**

Herd, Live in a (*agelaios*): The distinction between animals that live in herds and those that live scattered about (*sporadikos*) or are solitary (*monadikos*) is an important one (*Pol*. 1256^{a}23), as is that between herd animals and political ones (*HA* 488^{a}7–9, *Pol*. 1253^{a}7–9). So "herd" is used to mark the distinction, even where we would more naturally use "flock," "shoal," or some other term, as in the case of insects (*HA* 623^{b}8) or dolphins (631^{a}16). Shoal fishes (*chutoi*) (*HA* 543^{a}2) are "the ones caught in nets," whereas the "fish that go in shoals with the currents (*rhuades*)"—like the ones that live in herds, and perhaps not always distinguished from them (598^{a}28)—do seem to form some sort of natural class (543^{b}13–14, 570^{b}11). A "gathering (*athroisis*)" of animals need not be a herd, but a flock (*poimê*) of sheep (573^{b}25) is one.

Hetaireia: **Political Club**

Hexis: **State**

Hiding, Going into (*phôlein*): Aristotle uses the verbs *phôlein* and *phôleuein* for hibernation proper and for aestivation (*HA* 598^{b}4–20), but also for something more general and more akin to just staying out of sight (632^{b}27).

Historia: Not a history, in our sense of the term, but an inquiry, and, in Aristotle, more precisely, a preliminary stage in the development of a science, when data is collected and systematically categorized, but not typically given a causal explanation. One reason that *HA* 10 is thought not to properly belong with the other books of *HA*, indeed, is that it does contain such explanations.

Hoi polloi: **Ordinary People, the Many**

Homoiomerês: **Uniform**

Homonymy (*homônumia*): "Things are said to be homonymous when they have only the name in common but the account that corresponds to the name is distinct" (*Cat*. 1^{a}1–2).

Honor (*timê*): (1) "Honor is like a sort of estimate of worth" (*Rh*. 1365^{a}7–8). (2) Honor is "the greatest of external goods" (*NE* 1123^{b}20–21). (3) "Honor is a prize of virtue and is awarded to good people" (1123^{b}35–1124^{a}1; also 1163^{b}3–4). (4) "Those things are noble for which the rewards are honor" (*Rh*. 1366^{b}34–35). (5) "Those who desire honor from decent and knowledgeable people . . . are aiming to confirm their own beliefs about themselves" (*NE* 1159^{a}22–23; also 1095^{b}26–28). See **Noble, for the Sake of the**

Hoper: **Precisely**

Hoplite (*hoplitês*): A heavily armed infantryman, who carried a round shield (*hoplon*), a spear, and a sword. Since he had to provide these at his own expense, only moderately rich people could afford to be hoplites. Poorer people rowed in the navy or served as light-armored troops. Richer citizens, who could afford a horse, fought in the cavalry. Citizen hoplites were the principal fighting force in Greece until mercenaries replaced them late in the 4th cent BC. The hoplites are a larger class than the rich "few" who rule in an oligarchy but smaller—since hoplite weapons are expensive—than the poor "many" who rule in a democracy. That is why a polity, which is so called because it is "made up of those with hoplite weapons" (*Pol*. 1265^{b}28–29), is in the mean or middle between the two of them.

Hopos: **Fig Juice**

Hôra: **Bloom**

Horasis: **Seeing**

Horismos: **Definition**

Hormê: **Impulse**

Horos: **Defining Mark, Definition**

Hôs epi to polu: **Most Part, for the**

Hou heneka: **For-the-sake-of-which**

Household Management (*oikonomikê*): Household management (also *oikonomia*) when possessed by a male is (1) the craft or science that deals with the use of wealth or property (*Pol.* 1256^{a}10–13) and to some extent with its acquisition too (1256^{b}26–30); when possessed by a female it is (2) the craft of preserving it (1277^{b}24–25). The natural part of the craft of property acquisition is a part of (1) (1256^{b}26–27), but the craft of commerce is not. Other parts of (1) are mastership of slaves, marital science, and procreative science (see 1.3, 1.12–13).

Hubris: **Wanton Aggression**

Hudôr: **Water**

Hugros: See **Dry**

Hulê: **Matter**

Human Being (*anthrôpos*): (1) An *anthrôpos* is a human being of either sex. The adjective *anthrôpinos* often seems to mean something like "merely human" (*NE* 1177^{b}32). *Anthrôpikos* sometimes has similar connotations (1178^{a}10). Indeed, *anthrôpos* itself is sometimes used to refer to the whole human animal, sometimes to the human element in human beings by contrast with the divine one (their understanding) (1177^{b}27–28), and sometimes to that divine element, since it is what makes human beings distinctively human (1176^{a}25–29). In considering what the work of a human being is (1097^{b}24–25), and what its most complete virtue is (1098^{a}17–18), it is important to bear these facts in mind. (2) A human being is by nature a political animal (*NE* 1169^{b}18–19), where political animals are "those among which there is some single work common to all" (*HA* 488^{a}7–8). In this sense, animals such as bees, wasps, ants, and cranes also count as political animals. But human beings are political animals to a higher degree than any herd animal. For they alone "have perception of the good and the bad, the just and the unjust, and the rest. And it is community in these that makes a household and a city" (*Pol.* 1253^{a}16–18). So human beings are political animals more than others, because they are by nature city (*polis*) dwellers (*NE* 1162^{a}17–19, *Pol.* 1278^{b}15–30).

Humor, Juice (*chumos*): (1) the "juice" or sap in plants (*HA* 554^{a}13, 596^{b}17); (2) animal juices (556^{b}22); (3) the special object of taste (*DA* 418^{a}13), which is a sort of touch (414^{b}11); (4) a sort of seasoning that adds flavor (414^{b}13).

Huparchein: **Belong to, Hold**

Huperochê: **Excess**

Hupokeimenon: **Underlying Subject**

Hupolêpsis: **Supposition**

Hupozôma: **Diaphragm**

Hypothesis (*hupothesis*): (1) "A posit that assumes either part of a contradiction" (*APo*. 72^{a}18–20). (2) "Hypotheses are the starting-points of demonstrations" (*Met*. 1013^{a}16). (3) The hypothesis of a political constitution is its basic presupposition about how happiness is to be achieved and what it consists in, and so is identified with the deliberately chosen aim of the constitution (*Pol*. 1261^{a}16, 1271^{a}41, 1273^{a}4).

Idea: See **Form, Platonic**

Idion: **Private, Special**

Image: *Eidôlon*

Imagination (*phantasia*): Discussed at *DA* 3.3. The important distinction between perceptual imagination and deliberative imagination is drawn at *DA* 434^{a}6–12.

Imaginative Part (*phantastikon*): "The same as the perceptual part, though the being for imagination and the being for perception are distinct" (*Insomn*. 459^{a}15–17). Also mentioned at *DA* 432^{b}1.

Imitate, Imitation (*mimeisthai*, *mimêsis*): "A likeness (*eikôn*) is something whose coming to be is through a *mimêsis*" (*Top*. 140^{a}14–15), so that to imitate (*mimeisthai*) something is (roughly speaking) to be like it in some respect, act like it in some way, or produce something that is like it in some way. Hence *mimêsis* is a quite general notion, the use of which in *Po*. 1–3, 6, and its cognate use in *Pol*. 8 (1336^{b}16, 1340^{a}12, ^{a}39) and elsewhere (*Rh*. 1371^{b}6, †*MM* 1190^{a}31), is continuous with its use in other treatises. Translating it as "mimesis" there, as if it were a technical term special to poetics, disguises this fact, while translating it as "representation" prevents the continuity from being properly reflected across all the treatises. The following examples are illustrative: "craft imitates nature" (*Ph*. 194^{a}21–22; also *Mete*. 381^{b}6); the palm of the ape imitates the human heel (*HA* 502^{b}9–10); the *anthos* imitates the horse's voice (609^{b}16–17); the lives of the other animals contain "many imitations of the life of human beings" (612^{b}18–19); the beings that imitate the numbers (*Met*. 987^{b}11–12); "the plane and the solid are imitations" of "the numbers being of a certain quality" (1020^{b}3–5); "things that cannot pass away are imitated by things that are involved in change" (1050^{b}28–29); a rash person imitates a courageous person (*NE* 1115^{b}32), while others imitate the great-souled person (1124^{b}2); one should imitate the better person in everything (1171^{b}12); "names are imitations, and the voice, the most imitative of all our parts" (*Rh*. 1404^{a}21–22).

Immediate (*amesos*): To be immediate is to lack a middle term: so C belongs to A indivisibly (*APo*. 79^{a}33) or immediately if and only if there is no distinct term B such that if B belongs to A and C belongs to B, then it follows deductively that C belongs to A. Immediates are also referred to in *APo*. as *atoma* ("indivisibles").

Immortality (*athanasia*):(1) "Immortality is eternal life; for immortality seems to be an affection or coincident of life" (*Top*. 126^{b}35–37). (2) "The activity of a god is immortality, and this is eternal living" (*Cael*. 286^{a}9).

Immortalize (*athanatizein*): The precise meaning of the injunction "one must as far as possible immortalize" (*NE* 1177^{b}33)" is difficult to determine. The one other occurrence of its verb in a text of Aristotle's (although it may be spurious) is in F223: "Aristotle himself, in his *Defense against the Charge of Impiety*, if the speech is not spurious, says, 'For I would never have proposed to sacrifice to Hermias as an immortal, but prepared a memorial to him as a mortal and, wishing to immortalize his nature adorned it with funerary honors.'" Since there is no inconsistency and slim basis for a charge of impiety in preparing a memorial for someone and adorning his body with burial honors, on the one hand, and simply regarding him as being *like* an immortal, on the other, *athanatizein* must mean something like "make an immortal of." Aristotle's injunction, then, would be that one must make an immortal of oneself by living in accord with one's immortal element (*nous*), which is what one most of all is; something one would accomplish by contemplating—by engaging in god's science, which is theoretical wisdom (*Met*. 982^{b}22–983^{a}11). Compare Plato, *Timaeus* 90b–c.

Imprint: See **Outline**

Impulse (*hormê*): The claim that "a human being is by nature a political animal" (*Pol*. 1253^{a}2–3) means, in part, that "by nature, the impulse toward this sort of community exists in everyone" (1253^{a}29–30)—nature and impulse are again associated at *Met.* 1023^{a}9, and opposed to what is forced (1072^{b}12).

Impulsive (*melagcholikos*): A *melagcholikos* person is not melancholic in our sense of the term but someone who has intense desires (*NE* 1154^{b}11–13) and is easily affected by imagination and dreams (*Mem*. 453^{a}19, *Div. Somn*. 463^{b}17).

In (*en*), **Said of** (*legetai*): The distinction is introduced in *Cat*. 1^{a}20–21, where the former is explained as follows: "I call 'in a subject' what is in something, not as a part, and cannot exist separately from what it is in" (*Cat*. 1^{a}24–25). Though no comparably direct account is given of "said of a subject," at 2^{a}19 we learn two necessary, and perhaps jointly sufficient, conditions for it: if B is said of a subject, A, then both the name of B and the definition of B will be predicated of A. The "said of" relation is ontological, not linguistic: it is (the form) human that is said of Socrates, because both its name ("human") and its definition ("rational animal") are predicated of Socrates.

Increase and Decrease (*auxêsis kai phthisis*): In biological contexts, "growth and withering."

Indictment (*eisaggelia*): Unlike a writ, an indictment had to be brought before the assembly of Athenian male citizens or before its steering committee, the council, either of which could elect to hear the case or refer it to the courts for trial (*Ath*. 43.2, 45.2). See **Denunciation; Writ**.

Indignation (*nemesis*): The most extended discussion is in *Rh*. 2.9, where indignation is classified as a feeling. At *NE* 1108^{a}35–^{b}6, however, it is a virtuous state and, at *EE* 1233^{b}24–27, it includes pain at undeserved misfortunes, something *Rh.* ascribes to pity.

Indivisible (*atomon*): What is *atomon* ("uncuttable") is in some way indivisible, so that points are indivisible (*Met*. 1016^{b}26), but bodies (including so-called atoms) are not (*GC* 316^{a}14–^{b}5). An *atomon* F is one not divisible into further Fs, so that an *atomon* form (*Ph*. 227^{b}7) is one not further divisible into forms, and an *atomon* human being is an indivisible, individual, or particular human being (*Cat*. 1^{b}4–6, 3^{a}38); what is *atomon* in this way is one in number (3^{b}12–13). When F is a quality, or some other item that is not a substance, *to ti* F, such as *to ti leukon* (1^{a}27–28), it may be an ultimate shade of white, with no further sub-shades, or—as is perhaps more likely—a particular instance of some shade of white, whose presence in a particular substance, A, makes it true that it coincides with A and that A is predicatively white (*Met*. 1077^{b}5–9).

Indivisible Lines (*atomoi grammai*): Plato held that a point "consisted of indivisible lines" (*Met*. 992^{a}22). *GC* 316^{a}11–12 mentions those who argue in a logico-linguistic way that there must be indivisible magnitudes "because the triangle-itself will [otherwise] be many." The spurious *On Incommensurable Lines* gives the argument: "If there is a Form of line, and if the first of the things is called by the same name, then, since the parts are prior to the whole, line-itself must be indivisible" (968^{a}9–11). But indivisible lines conflict with a starting-point of mathematics, namely, that quantities are divisible without limit. In this regard positing them is quite different from raising puzzles or fallacies proper to mathematics, because these are based on its starting-points. Hippocrates' argument for squaring the circle by means of lunes is thus a geometrical fallacy, since "it is directed against geometry only, because it is based on starting-points that are special to it" (*SE* 172^{a}4–5). However, someone who gives Antiphon's argument for squaring the circle, which assumes that a circle is a polygon with a large but finite number of sides, has produced a sophistical refutation, since his argument is not proper to geometry but "*koinos* (common)" (172^{a}8–9). Dealing with him, as a result, is a job for dialecticians: "to get [a theoretical grasp] on a refutation based on what is common, and that falls under no [specialized] craft, belongs to dialecticians" (170^{a}38–39).

Induction (*epagôgê*): "Induction is the route from the particulars to the universal" (*Top*. 105^{a}13–14), which begins with perception of particulars and ends with the grasp of a universal by understanding (*APo*. 99^{b}35–100^{b}5).

Indulgence (*apolausis*): (1) "Ordinary people . . . suppose [happiness] to be pleasure. And that is why the life they like is the life of indulgence" (*NE* 1095^{b}16–17), specifically in "bodily pleasures" (*EE* 1215^{b}5; also *Pol* 1270^{b}35). (2) "The things that are fruitful are more useful, while the things that are related to indulgence are more free" (*Rh*. 1361^{a}16–17).

Insects (*entoma*): "All the animals that . . . have either their underneath parts, back parts, or both in sections, and do not have either a separate bony part or fleshy part, but something intermediate between the two; for their body is similarly hard both on the inside and outside" (*HA* 523^{b}13–17).

Insofar as (*hê(i)*): (1) The dative of the relative pronoun, (Latin) *qua*—as "in being qua being." The science of the latter is that of being regarded in a certain way, namely, insofar as it is being, not the science of a special sort of being: being-qua-being. (2) "By 'insofar as,' I mean this: The bronze is indeed potentially a statue, but nonetheless it is not the actualization of the bronze insofar as it is bronze that is movement. For being for bronze is not the same as being for a certain potential, since if it were unconditionally the same in account, the actualization of the bronze would be a sort of movement" (*Met*. 1065^{b}23–27). (3) When X is G insofar as it is F, F is often the intrinsic cause or basis of X's being G.

Inspection (*euthuna*): A procedure designed to ensure (typically) democratic control of officials (*Pol*. 1274^{a}17, 1281^{b}33, 1282^{a}26, 1322^{b}11). Officials were subject to inspection to see whether they had taken bribes, embezzled public funds, or been guilty of maladministration (*Ath*. 54.2).

Instrument (*organon*): An *organon* is often what we would naturally call an "organ," such as the heart, but just as often it refers to some part of an animal, such as a foot, that we would not call one, or to a craftsman's tools, making "instrument" preferable as a consistent translation.

Intelligible Object (*noêma*): An intelligible object or content is a universal form. Encoded in an appearance, it can be grasped by the understanding when it contemplates that appearance: "To the thinking soul . . . appearances are like perceptual affections. . . . What is capable of understanding, then, understands the forms in the appearances" (*DA* 431^{a}14–^{b}3). It differs from an appearance in being a propositional element—an element of something with a truth value: "when one contemplates, one must at the same time contemplate an appearance. . . . But imagination is distinct from affirmation and denial; for truth and falsity involve a combination of intelligible objects" (432^{a}8–12).

Interval: See **Dimension**

Intrinsic (*kath' hauto*): Something is intrinsically F—or F by itself, in its own right, or (Latin) *per se* F—if it is F unconditionally, or because of what it itself essentially is: "'intrinsically' and 'insofar as it is itself' are the same" (*APo*. 73^{b}29). Socrates is intrinsically rational, since being rational is part of being human and Socrates is essentially human, but he is not intrinsically musical, since being musical is not part of what it is to be human. See **Coincident**

Isos: **Equal**

Isôs: See **Perhaps**

Jibes (*skôptein*): Wit, or jibing well, is "well-educated wanton aggression" (*Rh*. 1389^{b}11–12). It is discussed at *NE* 4.8.

Judge (*dikastês*): Athenian trials had large juries which reached their decision without deliberation or judicial guidance, so that these served as both judge and jury. Being eligible to serve in the ruling office of judge was an important prerogative of the unconditional citizen (*Pol*. 1275^{a}22–23).

Juice: See **Humor**

Justice (*dikaiosunê*): The fullest discussion is in *NE* 5; *Pol*. 3.9, 3.12 are also important.

Kairos: **Opportune Moment**

Kakoêtheia: **Cynicism**

Kalokagathia: **Noble-goodness**

Kalos: **Noble**

Kanabos: **Mannikin**

Kanôn: **Standard**

Kapêlikê: **Commerce, Craft of**

Karteria: **Resilience**

Katamênia: See **Seed**

Kataphasis: **Affirmation**

Katêgorein: **Predicate**

Katêgoria: **Category**

Katêgorikos: **Positive**

Katharsis: **Purgation**

Kath' hauto: **Intrinsic**

Kath' hekaston: See **Universal**

Katholou: **Universal**

Kêrux: **Trumpet Shell**

Keynote (*endosimon*): Both a prelude or an introduction and what establishes the pitch for musicians at the beginning of a performance. See *Pol.* 1339^{a}13, *Rh.* 1414^{b}24, 1415^{a}7.

Kind (*genos*): (1) Aristotle's uses of *genos*, *eidos*, and *diaphora*—of which "genus," "species," and "differentia" are the traditional (but inaccurate) Latinate translations—are many and various. In the strict sense "a kind is what is predicated in the what-it-is of many things that differ in form" (*Top.* 102^{a}31–32), and is studied by a single science. But as the entry in *Met.* 5.28 shows, it can also be quite a few other things besides this, e.g., a race or bloodline. A category too is quite often referred to as a kind (*Ph.* 189^{a}14, *Met.* 1070^{b}20, 1089^{b}28). By the same token, a *diaphora* is sometimes a difference that divides a kind into forms, and so figures in their essential definitions: "forms are composed of the kind and the differences" (*Met.* 1057^{b}7). But often *diaphorai* are simply the different features that distinguish one sort of thing from another, without necessarily suggesting that the sorts in question are kinds or forms. Among kinds in the strict sense, Aristotle occasionally lists some he calls "chief kinds" (*HA* 490^{b}7, 16, 505^{b}26). (2) Difference is distinguished from distinctness (*heterotês*) at *Met.* 1054^{b}23–30.

Kind, Fourth (*tetarton genos*): (1) "This fourth kind [of animal] must be sought on the moon; for the moon appears to participate in [the elemental body] at the fourth remove" (*GA* 761^{b}21–22). (2) "In Cyprus, in places where copper ore is smelted, and thrown there for many days, beasts come to be in the fire" (*HA* 552^{b}10–12). (3) "If, then, ice is the solidification of wet and cold, fire will be the boiling of dry and hot. That is why nothing comes to be either from ice or from fire" (*GC* 330^{b}28–30). (4) "Fire does not generate any animal, nor, it is evident, anything composed in things affected by fire, whether wet ones or dry ones" (*GA* 737^{a}1–3). (5) "It is only in earth and in water that there are animals, and not in air or fire, because the former ones are the matter of their bodies" (*Mete.* 382^{a}6–8). A way to partly resolve the tensions between these five claims is to recall that all of them, as belonging to natural science, rather than to a strictly theoretical one, hold only for the most part. But it is also important to remember that so-called (or non-elemental) fire's "underlying subject is smoke or charcoal" (*PA* 649^{a}21), that smoke is an exhalation that is dry and earthen (*Mete.* 341^{b}6–10). We are in an area, in other words, where "the more and the less and nearer and further" may indeed "produce a great and wondrous difference" (*GA* 761^{b}14–15).

Kinêsis: **Movement**

King (*basileus*): A kingship is a monarchical constitution that aims at the common advantage (*Pol*. 1279^{a}32–34). Its deviant form is tyranny. Five sorts of kingship are discussed in *Pol*. 3.14: Spartan kingship; barbarian kingship; dictatorship; consensual, elective, law-based kingship; and absolute kingship. In 3.15 (1285^{b}33–37) these are reduced to two fundamental sorts: Spartan and absolute. In 3.16 Spartan kingship is removed from the list of genuine sorts of kingship, on the grounds that it is not a sort of constitution (1287^{a}3–4).

Know, Knowledge: Although there may be little difference between *gnôsis* (verb: *gnorizein*) and *epistêmê* (verb: *epistasthai*), *epistêmê* is usually applied only to demonstrative sciences, crafts, or other bodies of systematic knowledge, so that *epistêmê* is specifically scientific knowledge. *Gnôsis* is usually weaker and is used for perceptual knowledge and knowledge by acquaintance—something familiar is *gnôrimon*. If X knows that p, it follows that p is true and that X is justified in believing it. Similar entailments hold in the cases of *epistasthai* and *eidenai* but may not hold in that of *gignôskein*.

Kochlias: **Land Snail**

Kochlos: **Sea Snail**

Koilia: **Stomach**

Koina: **Common Things**

Koinônia: **Community**

Knucklebone (*astragalos*): An ancient sort of die made from the knucklebone of a sheep used in a game of chance. See *HA* 499^{b}28–30.

Kolobos: **Docked**

Kottabos: A game involving flicking wine lees at targets.

Krasis: See **Blend; Mixture**

Krinein, krisis: **Discern, Judge**

Kuêma: **Embryo**

Kuêsis: **Pregnancy**

Kurios: (1) In a key sense what is *kurios* is what has executive power or authority or the power to compel, so that a general has control over his army and a politician over a city and its inhabitants. Since what has control in a sphere determines or partly determines what happens within it, it is one of the most estimable or important elements in the sphere, so that what is less estimable than something cannot or should not control it (*NE* 1143^{b}33–35, 1145^{a}6–7). (2) *Ta kuria* are the words that are in prevalent use among listeners (*Po*. 1457^{b}3–5). (3) When contrasted with the metaphorical sense of a term, the *kurios* sense is the "literal" one (*Top*. 140^{a}13). (4) The *kurios* definition

of something, like the *kurios* use of a term, is its strict one (*Cat*. 2[a]11, *Met*. 1020[a]4, [b]14), which thus exerts control over the extended uses of it (*DA* 408[a]6). (5) Similarly, the *kuriôtatos* differences of bodies are the principal or "most fundamental" ones (*Cael*. 307[b]19). (6) *Kuriôs* and *haplôs* ("unconditionally") are often used interchangeably (*Cat*. 14[b]24), as are *kuriôs* and *kath' hauta* ("intrinsically") (5[b]8).

Laborer, Hired (*thês*): A free, landless laborer, who was not a craftsman and who worked for hire. His status in Aristotle's scheme of things, like that of an unrefined craftsman, is somewhat anomalous.

Land Snail: *Kochlias*

Larva (*skôlêx*): "That from the whole of which the whole of the animal comes to be, as the embryo becomes articulated and grows" (*HA* 489[b]7–9).

Last Thing (*eschaton*): See **End**

Law (*nomos*)
(1) "The law . . . [is] word that derives from a sort of practical wisdom and understanding" (*NE* 1180[a]21–22). (2) "Law is understanding without desire" (*Pol*. 1287[a]32).

Varieties: (1) "Law is either special or common. By 'special' I mean the written law by which people are governed; by 'common' I mean whatever unwritten ones seem to be agreed to among all" (*Rh*. 1368[b]7–9). (2) "Common [is] what is in accord with nature" (1373[b]6).

Scope: (1) "All law is universal" (*NE* 1137[b]13). (2) "There would need to be laws . . . concerning all of life" (1180[a]3–4). (3) "The law should rule everything" (*Pol*. 1292[a]32–33). (4) It is necessary "for laws to be laid down, but for them not be in control insofar as they deviate from what is best, although they should certainly be in control everywhere else" (1286[a]22–24). (5) "It is fitting for laws that are correctly laid down to define everything themselves, wherever possible, and leave the fewest things up to the judges" (*Rh*. 1354[a]31–34). (6) "To seek to be wiser than the laws is the very thing that is forbidden in the laws that are praised" (1375[b]23–25).

Aim: (1) "The laws . . . pronounce about all matters, aiming either at the common advantage of all or at that of the best people or of those who—in accord with their virtue or in accord with some other such thing—are in control. So, in one way, the things we call 'just' are the ones that produce and safeguard happiness and its parts for the political community" (*NE* 1129[b]14–19). (2) "The law prescribes living in accord with each virtue and forbids living in accord with each depravity" (1130[b]23–24).

Limitations: (1) "About some sorts of things it is not possible to pronounce correctly in universal terms" (*NE* 1137[b]14). (2) "This is the very nature of the decent—a rectification of law insofar as it is deficient because of its universality" (1137[b]26–27).

Role in constitutions: (1) "It is with a view to the constitution that the laws must be laid down. But if this is so, it is clear that laws that are in accord with correct

constitutions must be just, and those in accord with deviant constitutions not just" (*Pol*. 1282^{b}10–13). (2) "The separate laws . . . are among the things that make clear what the constitution is" (1289^{a}18–19). (3) "Where the laws do not rule there is no constitution" (1292^{a}32).

Legetai: **Said to Be**

Legislative Science (*nomothetikê*): Legislative science is an architectonic sub-branch of politics (political science) that drafts universal prescriptive laws with the aim of furthering the happiness of citizens by inculcating the virtues in them and directing their actions (*NE* 1180^{b}23–28) but is also concerned with constitutional questions more broadly (*Pol*. 1288^{b}21–1289^{a}15). Hence a politician who practices it must know, e.g., when a particular city would most benefit from having an oligarchic constitution and how to establish and preserve such a constitution (even if it is not the unconditionally best one) by enacting laws that preserve it and further its ends. Since not everything can be exactly defined, even maximally exact laws cannot obviate the need for deliberation altogether (1287^{b}22–23, *Rh*. 1374^{a}26–^{b}23). Besides an architectonic legislative component, politics thus also needs a deliberative one, which, among other things, issues decrees.

Legislator (*nomothetês*)
A *nomothetês* in the strict sense of the term is someone who possesses legislative science (*nomothetikê*) in its complete, or perfected, form. Most of the actual legislators Aristotle discusses—Phaleas of Chalcedon, Hippodamus of Miletus, Lycurgus, Solon—do not come up to that high standard, as Aristotle's often decisive criticisms of them show. Yet such truth as their proposals do contain constitutes at least some small contribution to legislative science. They are nascent legislators, therefore, who possess nascent (or embryonic) legislative science.

Although "where the laws do not rule there is no constitution" (*Pol*. 1292^{a}32) and some laws make a constitution clear (1289^{a}18–20), there is nonetheless a difference between a constitution and a set of laws (1289^{a}15–25). So there is also a difference between those who craft laws only, and those who, like Lycurgus and Solon, craft a constitution too (1273^{b}32–34). No craft or science is singled out, however, as a specifically constitutional one. But what is said in the following text indicates the difference Aristotle has in mind: "One sort of practical wisdom concerned with the city is the architectonic part, legislative science, while the part concerned with particulars has the name common to both: 'politics.' This part is practical and deliberative. . . . Among the other sorts, one is household management, another legislative science, another politics, and of the latter, one part is deliberative and the other judicial" (*NE* 1141^{b}24–33). It is clear, then, that while a legislator focuses exclusively on a city's laws, a designer of constitutions also includes the management of the city's households as well as its deliberative and judicial functions within his purview.

It is also reasonably clear that "the practical wisdom concerned with the city" has these same things within its purview. But this practical wisdom is "the same state [of

the soul]" as politics, or political science (*NE* 1141^{b}23–24), implying that the science a designer of constitutions needs is precisely politics itself—a description of which is given at *Pol.* 1288^{b}21–1289^{a}25. This would explain why no specifically constitutional science is introduced.

Another relevant distinction is made in the following text: "Some of those who have had something to say about a constitution took no part whatever in political actions, but always lived a private life. . . . Others became legislators, some for their own cities, others for some foreign ones as well, because they engaged in politics themselves" (*Pol.* 1273^{b}27–32). A nascent legislator need not have ever been active in politics or be a citizen of the city for which he is legislating, then, likewise a designer of constitutions.

To become a legislator in the strict sense, a study of collections of laws and constitutions is useful to "people who are able to get a theoretical grasp on them and judge what is correctly done or the opposite and what sorts of things fit with what" (*NE* 1181^{b}7–9).

Legomena: **Say, Things We**

Leiotês: See **Roughness and Smoothness**

Leisure (*scholê*)

Aristotle's way of thinking about leisure overlaps with ours but differs from it in important ways. We think of leisure time as time off work in which we can do as we choose. Aristotle agrees that leisure time and work time are distinct (*Pol.* 1256^{a}32), but he thinks that activities that are entirely leisured must be choiceworthy solely because of themselves. Among these he includes such scientific activities as the exercise of theoretical wisdom or mathematical knowledge, which we might think of as work. In these, he thinks, complete happiness consists (*NE* 1177^{b}19–26).

Entirely unleisured activities are choiceworthy solely because of some additional end, such as producing or providing the necessities of life (*NE* 1176^{b}2–3)—included among these are the canonical productive crafts or sciences (*Met.* 1048^{b}18–35). Activities that are choiceworthy in part because of themselves, and in part because of an additional end, include activities in accord with practical wisdom and the virtues of character. These too constitute happiness, but of a less than complete or secondary sort (*NE* 1177^{b}4–26, 1178^{a}9–22).

Most people would include amusing pastimes as leisured activities par excellence (*NE* 1176^{b}6–17), but Aristotle does not agree. For amusement is not an end, since it occurs "for the sake of activity [in accord with virtue]" (1176^{b}35–1177^{a}1). Nonetheless, because humans do have to engage in unleisured practical and productive activities, in a good political constitution "those introducing amusement should watch for the opportune time to use it, as if dispensing it as a medicine" (*Pol.* 1337^{b}40–42; also 1339^{b}31–42).

Leitourgia: **Public Service**

Lêmê: **Rheum**

Lepidôtos: **Soft-scaled**

Leptos: See **Coarse-grained**

Leukê: **White-sickness**

Lexis: "Expression through use of names" (*Po*. 1450^{b}13–14), but also "speech," "diction," or "style."

Life (*bios, zôê*): *Zôê* typically refers to the sorts of life processes and activities studied by biologists, zoologists, and so on, such as growth, reproduction, perception, and understanding. *Bios* refers to the sort of life a natural historian or biographer might investigate—the life of the otter, the (especially, agentive) life of Pericles—and so to a span of time throughout which someone possesses *zôê* at least as a capacity (*NE* 1102^{b}5–7). Hence we are reminded that a certain *zôê* will not be happiness for a human being unless it occurs "in a complete *bios*" (1098^{a}18–20). But the two notions are often more or less equivalent.

Light (*phôs*): "Light is the activity . . . of the transparent insofar as it is transparent." (*DA* 418^{b}9–10).

Likelihood (*eikos*): (1) "A likelihood is an acceptable premise (for what people know happens or does not happen for the most part, or is or is not so for the most part, is a likelihood)" (*APr*. 70^{a}2–5). (2) "A likelihood is what comes about for the most part, not however simply so, . . . but rather when it concerns things that admit of being otherwise, standing in relation to what it is a likelihood in relation to as the universal stands to the particular" (*Rh*. 1357^{a}34–^{b}1). (3) When it is *eikos* that something is so, it "makes perfect sense" that it is so.

Limit (*peras*): The focal discussion is *Met*. 5.17.

Liparos: **Oily**

Logico-linguistic (*logikos*)
The adjective *logikos* is used to distinguish a set of propositions and problems from those belonging to natural science or ethics: "Premises such as the following are ethical—for example, whether one must obey one's parents rather than the laws, if they disagree; logico-linguistic—for example, whether the science of contraries is the same or not; natural scientific—for example, whether the cosmos is eternal or not. And similarly for the problems" (*Top*. 105^{b}21–25). Since the question about a science of contraries is a philosophical one (*Met*. 996^{a}18–21), *logikos* problems overlap with philosophical ones. At the same time, if an argument is from "false but acceptable premises, it is *logikos*" (*Top*. 162^{b}27), suggesting that *logikos* arguments overlap with dialectical ones, since both may rely on acceptable beliefs (*endoxa*) or—more or less equivalently—on things said (*legomena*) or things that appear to be so about the issue.

When Plato, unlike previous thinkers, is accorded a share of dialectic it is due to his investigation of *logoi* or accounts (*Met*. 987^{b}31–33), which he almost always undertook

through staged Socratic conversations, whose aim was to discover the correct definition (1078^{b}23–25) of what something essentially or intrinsically is, or is itself-by-itself (*auto kath' hauto*)—the "itself" in the name of a Form probably stems from its being the ontological correlate of such a definition (1040^{b}32–34). One core meaning of *logikos*, in fact, relates it to conversation and speaking, while another relates it to reason. When we ask *logikôs* (adverb) why it is that these bricks and stones are a house, what we are asking for is a formal cause or an essence (1041^{a}26–28), which is presumably why a deduction of the essence is a *logikos* deduction (*APo*. 93^{a}15).

When dialecticians are contrasted with natural scientists, it is on the grounds that "the natural scientist gives the matter, the dialectician the form and the account" (*DA* 403^{b}1–2)—again associating dialectic with proceeding *logikôs*. The dialectician proceeds *logikôs*, the natural scientist *phusikôs*—looking to matter but also to form, when the relevant essence requires it: "[that] is why it belongs to the natural scientist to get a theoretical grasp even on some of the soul, that is, on as much of it as is not without matter" (*Met*. 1026^{a}5–6). So to proceed in a strictly *logikôs* way, when there is empirical evidence bearing on the subject, is bad science (*DA* 402^{b}17–403^{a}3).

Before we start defining essences logico-linguistically, then, we should have intimate knowledge of the empirical data that they are supposed to explain (*GC* 316^{a}5–11). A frequent criticism of Plato and the Platonists is that, in proceeding logico-linguistically, they leave the earth and the world of facts too far behind and proceed at too abstract and general a level (*Met*. 987^{b}29–988^{a}7, 1069^{a}26–28). The "craftsmen of logico-linguistic arguments" (*EE* 1221^{b}7) are those who produce sophistries. When the perceptual data are scarce, however, it is still possible to make some scientific headway. Astronomy is a case in point. Our theoretical knowledge of the heavenly bodies is relatively slight, "for both about the things on the basis of which one would investigate them and the things about them we long to know, the things evident to perception are altogether few" (*PA* 644^{b}25–28). There are many puzzles in astronomy, therefore, about which we can do little but conjecture, since "we think that we have given a sufficiently rational demonstration about things inaccessible to perception, if we lead them back to what is possible" (*Mete*. 344^{a}5–7), given the available appearances. "To become a little more puzzle-free" in areas like these is the most we can hope for until further perceptual data (*Cael*. 291^{b}24–28) and better theories (*Met*. 1073^{b}13–17) become available.

Logikos: **Logico-linguistic**

Logos

An important notion—or, better, a series of connected notions—in Aristotle. In many instances a *logos* is a reason, or a capacity to give reasons. As the latter, it is located in each of the two sub-parts of the part of the soul that has it, the scientific part and the rationally calculative or deliberative part (*NE* 1139^{a}3–14), and is contrasted with the desiring part of the soul (comprising appetite, spirit, and wish), which shares in reason "insofar as it is able to listen to reason and obey it" (1102^{b}31), but cannot give reasons, whether scientific or deliberative.

In a related sense *logos* is what reasons, reasonings, and thoughts more generally are typically expressed and communicated in: "A *logos* is a significant voiced sound, some part of which is significant in separation—as a phrase but not as an affirmation" (*Int*. 16^{b}26–28). A *logos* of this sort is a "saying." This may be a single name or word, but when it is assertoric it always involves a name and a verb, and is either true or false (17^{a}2–3, *Cat*. 2^{a}4–7), and may be either an affirmation or a negation. A premise in an argument is thus "a *logos* that affirms or negates something of something" (*APr*. 24^{a}16–17). This sort of *logos* is a "sentence." A combination of sentences may itself result in a *logos*, namely, an "argument"; for "arguments are from premises" (*Top*. 101^{b}15–16). Speech, the capacity to say things and utter sentences, is also *logos*: "speech is for indicating what is advantageous or harmful, and so too what is just or unjust" (*Pol*. 1253^{a}14–15).

The *logos* of N is something that can replace the name "N" because it signifies the same thing as "N" (*Cat*. 1^{a}1–2, *Top*. 101^{b}38–102^{a}1, *Ph*. 184^{b}10, *Met*. 1006^{b}1–2, 1030^{a}7–8). This sort of *logos* is an "account." One important sort of account is a definition (*Top*. 101^{b}38). The form that is in accord with the *logos* (in the sense of a definitional account) is sometimes itself referred to as a *logos* (*DA* 412^{b}16, 414^{a}28) or definition (*Met*. 1086^{b}3–4).

In various contexts, including mathematical ones, a *logos* is a ratio (*Mete*. 379^{b}35, *DA* 424^{a}28), and when it is contrasted with a work (*Rh*. 1371^{b}23) or with a thought (1374^{b}12), it is a word.

Love (*philein*, *philia*): See **Friendship**

Love, Object of (*to philêton*): What friends do is love (*philein*) each other. The object of love (or the lovable) is that feature in a person (such as his virtue or his being a source of pleasure or utility) that attracts his friend's love to him.

Luck (*tuchê*): What happens because of luck in the broad sense is what happens coincidentally or contingently (*APo*. 87^{b}19–22), so that luck in that sense is pretty much the same as the chance or spontaneity (*to automaton*) that applies to all those things "whose cause is indefinite, which do not occur for the sake of anything, or always, or for the most part, or in some orderly way" (*Rh*. 1369^{a}32–34). But in a narrower sense, which is contrasted with chance, what happens by luck is what has a coincidental final cause: "Luck is a coincidental cause in things that come about in accord with deliberate choice for the sake of an end" (*Met*. 1065^{a}30–31). So, if a tree's being by the back door is the sort of thing that might be an outcome of deliberative thought, it is a candidate final cause of action—an end we aim at (*Ph*. 197^{a}5–9, ^{b}20–22). If wish, which is the desire involved in deliberation and deliberate choice, is what causes it to be there, the tree's being by the back door has a genuine final cause. If not, its being there has a coincidental final cause. Unlike chance, then, which applies quite generally to whatever results from coincidental efficient causes, narrow luck applies only to what could come about because of action and deliberate choice. Hence it is the sphere relevant to action: "Luck and what is by luck belong to whatever good luck and, in general, action also belong. That is why luck is of necessity concerned with what is

doable in action" (197^{b}1–2). The sphere of narrow luck is thus that of the practical and productive sciences (*Rh*. 1362^{a}2).

Luein, lusis: See **Refute**

Lune (*mêniskos*): See **Quadrature**

Lydian: See **Harmonies**

Majority (*plêthos*): A *plêthos* can be any multitude—any (typically) large group of people. But often it refers to the majority of the citizens of a city, not the majority of its total population (which may include many non-citizens, such as slaves and resident aliens). Because of this the notion inherits some of the problems inherent in the notion of a citizen. When Aristotle tells us that "the belief of the majority" (*Pol*. 1294^{a}12) has control in all constitutions, the majority he is thus referring to is the majority of the unconditional citizens (1275^{a}19–23) who participate in political office. In the case of an aristocracy or an oligarchy, this may be a relatively small number of people.

Makarios: **Blessed**

Malakia: **Soft-bodied Animals**

Malakodermos: **Soft-skinned**

Malakostrakos: **Soft-shelled**

Male and Female (*to arren kai to thêlu*): (1) "The male and the female are distinguished by a certain capacity and a certain incapacity (for what is capable of concocting, composing, and emitting seed containing the starting-point of the form is male—and by 'starting-point' I mean not the sort from which as from matter an offspring comes to be that is of the same sort as the progenitor, but rather the primary moving-producing one, whether capable of producing it within itself or in something else), while what is receptive of seed, but incapable of composing and emitting it, is female" (*GA* 765^{b}9–15). (2) "The female is like a deformed male, and the menses are seed, but not pure seed" (737^{a}27–29). (3) "We must suppose femaleness to be like a natural deformation" (775^{a}15–16). See **Woman**

Mania, Manic (*mania*, *manikos*): Of the relatively few passages in which Aristotle mentions mania in people, the following are perhaps the most illuminating: (1) "Naturally clever stock degenerates into rather manic characters (for example, the offspring of Alcibiades and of Dionysius), while steady stock degenerates into stupidity and sluggishness" (*Rh*. 1390^{b}28–31). (2) "The craft of poetry is for the naturally clever rather than for the manic person" (*Po*. 1455^{a}32–33). We are not, then, always dealing with literal madness (as at *Ath*. 56.6) but with something more like an overly excited, frenzied condition—a state of "possession"—that may be episodic. *Mania* in other animals, though, does seem to be a sort of madness, as in rabid dogs (*HA* 604^{a}6).

Mannikin (*kanabos*): Apparently, an outline drawing of the human body in which, e.g., its blood vessels can be seen. See *HA* 515^{a}35, *GA* 743^{a}2.

Margites: A lost Homeric burlesque recounting the deeds of a ridiculous hero.

Marriage (*gamos*): Focally discussed in *NE* 8.12, *Pol*. 1.12–13, 7.16.

Marrow (*muelos*): "A certain nature of blood" (*PA* 651^{b}20); "the residue of nourishment from the blood, distributed to bones and fish-spine, when it has been concocted and enclosed" (652^{a}21–23).

Master (*despotês*): Someone who (in the best case) exercises the rule of a master (*despotikê*) over natural slaves in accord with the craft or science of mastership. Discussed in *Pol*. 1.7.

Mates, Is Mated (*ocheuein*, *ocheuesthai*): The male mates (active); the female is mated (passive). Sometimes "mounts" is used for (active) mating to avoid ambiguity (*HA* 614^{a}3–10).

Mathematics (*mathêmatikê*): Many theorems in mathematics are special to some branch of it, such as arithmetic or geometry, but there are also "certain propositions stated by the mathematicians that are universal" (*Met*. 1077^{a}9–10), e.g., that proportionals alternate (*APo*. 74^{a}17–25). Nonetheless, the universality of the demonstration is open to challenge on the grounds that lines and numbers differ in kind. For "the extreme and middle terms [in a demonstration] must be from the same kind" (75^{b}10–11), so that kind-crossing demonstrations are ruled out: "it is impossible for what is proved to cross from one kind to another" (84^{b}17–18). Hence the causes due to which the theorem about proportionals holds in the case of lines and of numbers are distinct (99^{a}8–9), and so separate demonstrations seem to be needed in the case of each. But "insofar as admitting of a certain sort of increase" (99^{a}9–10), the demonstration is the same, so that the theorem is "common to all quantities" (*Met*. 1061^{b}19–21). For while "the kinds of the beings are distinct," some things "belong to quantities alone and others to qualities alone, and it is with the help of these that a proof is given through the common things" (*APo*. 88^{b}1–3). But though the universal theorem holds of all quantities, it does so by analogy (76^{a}37–41). Therefore, the kind to which lines, numbers, and so on belong, which is the ontological correlate of a theorem of universal mathematics, is not a first-order kind, but an analogical unity—a quantity—but no less robust for that. The differences between mathematics, natural science, and primary philosophy or science are discussed in *Met*. 6.1, and the nature of mathematical entities in 13.1–3.

Matter (*hulê*): (1) "By 'matter' I mean the first underlying subject of each thing from which it comes to be and which is present in it non-coincidentally" (*Ph*. 192^{a}31–32). (2) "By 'matter' I mean that which, intrinsically, is neither said to be a something, nor a quantity, nor anything else by which being is given definition" (*Met*. 1029^{a}20–21). (3) "By 'the matter' I mean what, though not actively a this something, is potentially a this something" (1042^{a}27–28). (4) Matter is "what is potentially . . . directly and

intrinsically" ($1070^{b}12–13$). (5) The final matter is that of "what is most of all substance" ($1070^{a}20$). (6) "Where what is predicated is a form and a this something, the ultimate underlying subject is matter and material substance" ($1049^{a}35–36$). (7) "Some matter is perceptible, . . . while some is intelligible—perceptible matter being, for example, bronze, wood, and any matter that is movable, and intelligible matter being the sort that is in the perceptible things but not insofar as they are perceptible, such as the objects of mathematics" ($1036^{a}9–12$). (8) Perceptible matter comes in a variety of different sorts. Movable matter, mentioned at $1036^{a}10$, is the sort something needs if it is to be capable of moving from place to place. Hence it is also referred as "matter for change of place" ($1042^{b}6$). Matter for alteration is the sort that things need if they are to change in quality ($1050^{b}16–18$). Then there is matter needed for movement with respect to magnitude, or increase and decrease (*Ph.* $260^{a}27$). And finally the matter needed for coming to be and passing away, which is most of all matter in the strict sense (*GC* $320^{a}2$). Things that have perceptible matter but not matter for coming to be or passing away include the various heavenly bodies (*Met.* $1050^{b}22–28$, $1069^{b}24–26$). (9) Intelligible matter is mentioned by name only at $1036^{a}10$, $1037^{a}5$, and $1045^{a}34$. But "the matter of the objects of mathematics" ($1059^{b}16$) is fairly certainly a reference to the same—or same sort—of thing.

Matter, Hypothetically Necessary: "Why is a saw such as it is? So that this may be, and for the sake of this. But in fact it is impossible that this thing that the saw is for the sake of should come to be, unless the saw is made of iron. It is necessary, therefore, for it to be made of iron, if there is to be a saw and its work. The necessity, then, is hypothetical, but not [necessary] as an end; for the necessity lies in the matter, while the for-the-sake-of-which lies in the account" (*Ph.* $200^{a}10–15$).

Matter, Intelligible (*noêtê*)

When a mathematician draws a particular equilateral triangle ABC in chalk on a blackboard, he uses it to represent an abstract particular equilateral triangle <ABC> whose sides are perfectly straight, exactly equal mathematical lines that have length but no breadth. <ABC> is an intelligible mathematical object. When he draws a second equilateral triangle DEF in order, e.g., to prove that <ABC> and <DEF> are congruent, what distinguishes these two abstract mathematical triangles from each other is not their form or shape, which is the same in both, but their distinct parcels of matter, and which are the abstract analogs $<m_1>$ and $<m_2>$ of the different parcels of perceptible matter, m_1 and m_2, consisting of chalk and areas of blackboard, that distinguish ABC from DEF (*Met.* $1034^{a}5–8$). <ABC> and <DEF> are particular abstract triangles, just as Callias and Socrates are particular non-abstract humans. And as the universal human is a sort of compound of this form (defined by the account of human) and this matter taken universally ($1035^{b}27–30$), so the universal mathematical triangle is a compound of the form (defined by the account of equilateral triangle) and something else. And this something else is not $<m_1>$ or $<m_2>$, which are distinct parcels of intelligible matter—this being the sort that is "in the perceptible things but not insofar as they are

perceptible" (1036^{a}11–12). Instead it is the abstract universal material of which they are instances—the analog, in other words, of the non-abstract universal material of which m_1 and m_2 are distinct instances.

It is this universal analog that the following text describes: "Of matter, there is some that is intelligible and some that is perceptible, and one part of the account is always the matter and the other the activation—for example, the circle is shape plus plane" (*Met*. 1045^{a}33–35). Here plane is the universal material component of the account or definition of the universal circle, and so of the universal equilateral triangle as well. It is thus a special case of intelligible matter. For what mathematicians leave behind when they do their abstracting from perceptibles is "only the quantitative and the continuous, sometimes in one, sometimes in two, sometimes in three dimensions, and the affections of things insofar as they are quantitative and continuous" (1061^{a}32–35). Intelligible matter taken universally, then, is the continuous—the abstract analog of physical space that the quantitative divides up (notice "lines and the continuous" at 1036^{b}9–10), and so make intelligible mathematical objects divisible.

Matter, Primary (*prôtê*)

At *GA* 729^{a}32 the female menses, which are obviously not intrinsically featureless, are said to correspond to *prôtê hulê* because they provide the matter for the embryo, not the form. At *Met*. 1015^{a}7 *prôtê hulê* is a thing's matter-based nature, which would be water "if all meltable things are water." At 1014^{b}32 it is the matter from which a thing is first made. At 1017^{a}5–6, where it is contrasted with ultimate matter, it is "divisible in form," and so must have a form. At 1044^{a}23, it is contrasted with ultimate matter. At 1049^{a}24–27, fire would be *prôtê hulê* if other elements were composed of it, but not it of anything else. From this survey it is clear that Aristotle does not use *prôtê hulê* to refer to intrinsically featureless (or so-called prime) matter.

Better evidence for a commitment to such matter is provided by the problem of elemental transformation. The elements earth, water, air, and fire, which are by definition the most primitive of sublunary bodies, can nonetheless change into one another in a way determined by their ultimate differences—hot, cold, wet, dry. If elements are adjacent, so that like earth and water, they share a difference, transformation occurs when one of the differences masters its contrary (*GC* 331^{a}27–30). Suppose, then, that earth (E) is first transformed into water (W), then into air (A), then into fire (F), so that m (the underlying subject requisite for all change) is E at t_1 and W at t_2 and A at t_3 and F at t_4. Since m underlies all elemental transformation, it cannot have any of the ultimate differences as an intrinsic affection: if it did, it would not be able to lose them. But because these differences are the ultimate ones, there are no others m can possibly have (329^{a}10–13). So it must have these differences, but not in the same way as the elements themselves (329^{a}24–35): fire is essentially or intrinsically hot, whereas m, while it may in fact be hot, must also be potentially cold, and so must be hot only coincidentally. For matter is that which "directly and intrinsically" is potentially hot, cold, and the rest,

without being any of them intrinsically or actually (*Met.* 1070^{b}12–13). It seems, then, that m must be intrinsically featureless matter.

However, if m is to underlie elemental transformation, a numerically identical portion or quantity of it must persist through the transformation: "The thing (whatever it is) by being which it underlies is the same, but its being is not the same" (*GC* 319^{b}3–4). But because it seems to possess none of the ultimate contrary differences intrinsically, such a portion of intrinsically featureless matter seems to impose no constraints whatsoever on element transformation. So, at the elemental level (and hence on up), anything could come from anything. But this Aristotle rules out: things cannot come to be from or pass away into just any random thing (*Ph.* 188^{a}31–^{b}8). Since elemental transformation is not in fact indiscriminate, then, but is constrained by the causal relations holding between the ultimate differences, m's defining potentialities must themselves be constrained by these causal relations. That is why Aristotle can simultaneously think that the elements come to be from *prôtê hulê*, and that they come to be from each other: "Since the elements cannot come to be either from an incorporeal thing or from another body, it remains for them to come to be from each other" (*Cael.* 305^{a}31–32). What an element comes from, then, is another element, but what underlies the transformation of one into the other is *prôtê hulê*, which is not a body separate from the elements, and has no essential or intrinsic affections besides the potentialities determined by the causal relations between the ultimate differences. *Mete.* 378^{b}34 and 379^{b}19–20 thus identify matter with the affectable capacities, namely, dry and wet.

Normally, a thing's potentialities or dispositional properties are based in its actual or categorical properties, as table salt's solubility in water is based in its molecular structure. But when we get down to ultimate components, there may be no base of this sort, as may be true in the case of mass or gravitational attraction. At that point, what we confront are dispositions or potentialities that are simply brute. All we can say is that m is something that (a) when coincidentally cold and dry (earth) has the potentiality to become cold and wet (water), and (b) when coincidentally cold and wet (water) has the potentiality to become hot and wet (air), and (c) when coincidentally hot and wet (air) has the potentiality to become hot and dry (fire), and (d) when coincidentally hot and dry (fire) has the potentiality to become cold and dry (earth). The higher-order disposition that m possesses to behave in these four ways but not in others shows that it is not a parcel of featureless matter, which is without dispositions as well as in all other ways indefinite. These causal continuities exhibited across the four ways explain why m is the same thing throughout them. Indeed, causal continuity is what explains the diachronic identity of substances themselves.

Matter, Ultimate (*eschatê*): Ultimate—or "proximate"—matter (*Met.* 1035^{b}30, 1045^{b}18) is the matter in which the relevant form is first present. It is referred to as "ultimate" or "last" because in the process of producing matter suitable for receiving the form it comes last. In the case of a statue, this might be bronze, which is produced from copper and tin. In the case of Socrates, it is the matter (namely, his mother's

menses as first set in form-transmitting motions by his father's seed to produce his own fetal heart) that constitutes him when he first comes to be a this something (*GA* 767^{b}29–36).

Maxim (*gnômê*): "A maxim is an affirmation . . . about universals, and not about all of them . . . , but about the things that actions have to do with, and with things that are to be chosen or avoided with a view to doing an action" (*Rh*. 1394^{a}21–26).

Mean, Middle, Intermediate (*mesotês*, *meson*): (1) "Things are said to have a *meson* in many ways" (*Top*. 149^{a}35–36). (2) "We say that those things are intermediates into which what changes must change earlier" (*Met*. 1057^{a}21–22). (3) "The intermediates are all in the same kind, intermediate between contraries, and all composed of the contraries" (1057^{b}32–34). The ethical mean is discussed in *NE* 2.8–9.

Mean, Perceptual: Mentioned at *DA* 431^{a}11, the perceptual mean is the constituent in a perceptual part that functions like a laboratory balance or weighing scale enabling it to detect differences in proper perceptibles, which activate it by tilting it, as it were, one way or another (424^{a}5–9). Depending on the makeup of these perceptibles, the activation of the perceptual modality is either pleasant or painful (426^{b}4–9). It is pleasant provided it is within the limits determined by—or consonant with—the ratio of the perceptual modality (and is painful otherwise). More precisely, since a perceptual modality works better within some areas of its range of operation than others, so that we see better in brighter light than in dimmer, perception is pleasant in the optimal range, the range of maximal consonance (*NE* 1174^{b}18–20). The better-known ethical mean piggybacks to some extent on the perceptual one, since the virtues of character are all involved with pleasures and pains and our correct perception and response to them.

Measure (*metron*): "That by which a quantity is known, and a quantity insofar as it is a quantity is known either by a one [or unit] or by a number, and all number by a one, so that all quantity insofar as it is quantity is known by the one, and what quantities are primarily known by, this is itself one" (*Met*. 1052^{b}20–23). See **Meter**

Mêkôn: A sort of digestive residue in the shelled animals (*HA* 529^{a}11–12, ^{b}10–11).

Melagcholikos: **Impulsive**

Memory (*mnêmê*): "Neither perception nor supposition but rather a state or an affection of one of these when time has passed" (*Mem*. 449^{b}24–25). Remembering is "the having of an appearance as a likeness of what it is an appearance of . . . [in] the primary perceptual [part], that is, the one by means of which we perceive time" (451^{a}15–17). The important distinction between remembering (*mnêmoneuein*) and recollecting (*anamimnêskesthai*), which tracks that between perceptual imagination and deliberative imagination, is discussed at 453^{a}9–14.

Menses (*katamênia*): See **Form, Transmission of**; **Seed**

Metablêtikê: **Exchange, Craft of**

Metaphor (*metaphora*): "The application to something of a name belonging to something else, either from kind to form, from form to kind, from form to form, or by analogy" (*Po*. 1457^{b}6–9).

Metaphysics

Metaphysics is the science of being qua being, which Aristotle calls "primary science" or "primary philosophy" (*Met*. 1026^{a}16, 1026^{a}24) and which we call "metaphysics," after the Greek title of the work (assigned by later editors) in which it is developed: *Ta Meta ta Phusika*. Unlike each of the special sciences, the science of being qua being gives us a picture not of a piece of the world, a region of being, but of the world these sciences collectively portray, which emerges from a meta-level, empirical investigation of the special sciences themselves. As each of these looks for universals (natural kinds) that stand in demonstrative causal relations to each other, so this meta-level investigation looks for higher-level universals that reveal the presence of common structures of explanation—form, privation of form, matter—in diverse sciences (*Met*. 1070^{a}31–^{b}21).

The special sciences show the presence in the world of a variety of *different* explanatory structures. The kind-crossing (or trans-generic) sciences, by finding commonalities between these structures, show the equally robust presence there of the *same* explanatory structure. The science to which form, privation of form, and matter belong is, in the first instance, kind-crossing natural science. It is the one that would be the primary science, were there no eternal immovable substances separable from the natural ones. But there is also a kind-crossing—or universal—mathematical science (*Met*. 1026^{a}13–23). And the introduction of intelligible matter (1036^{a}11–12), as the matter of abstract mathematical objects, allows us to see a commonality in explanatory structure between the mathematical sciences and the natural ones.

Between these two kind-crossing sciences and the theological one (*Met*. 1026^{a}19), on the other hand, the point of commonality lies not in matter, since the objects of theological science have no matter (1071^{b}20–21), but rather in form. For what the objects of theology, divine substances (which includes human understanding or *nous*), have in common with those of mathematics and natural science is that they are forms, though—and this is the crucial point of difference—not forms in any sort of matter whatever. That form should be a focal topic of investigation for the science of being qua being is thus the result of an inductive or empirical investigation of the various special sciences, and then of the various kind-crossing ones, which shows form to be the explanatory feature common to all their objects—to all beings. It is this empirical fact that provides the science of being qua being with a genuine kind-crossing object of study, thereby legitimating it as every bit as much a science as any generic-specific one. The science of being qua being is accordingly a science of form.

The question of how that science can at the same time be theology, the science of divine substance, is answered at *Met*. 1026^{a}23–32. So the primacy of theology, which is based on the fact that theology deals with substance that is eternal, immovable, and

separable, is supposedly what justifies us in treating it as the universal science of being qua being.

Meter, Poetic (*metron*): Paean: ˘˘˘ – (3:1); heroic: – ˘˘ (1:1); iambus: ˘ – (1:2); trochee: – ˘ (2:1). Where –= ˘˘.

Methodical Inquiry (*methodos*): Aristotle's treatises are typically self-described as methodical inquiries: *APr*. 46^{a}32, *Top*. 100^{a}18, *SE* 172^{b}8, *Ph*. 200^{b}13, *GC* 327^{a}31, *Mete.* 338^{a}25, *DA* 402^{a}16, *HA* 491^{a}12, *PA* 642^{b}3, *GA* 742^{b}10, *Met.* 983^{a}23, *NE* 1094^{b}11, *EE* 1214^{a}13, *Pol.* 1260^{b}36, *Rh.* 1355^{b}22, 1410^{b}8, *Po*. 1447^{a}12. In many cases such inquiries provide scientific knowledge (*Ph*. 184^{a}10–13), or, if not scientific knowledge, then a sort of educatedness (*PA* 639^{a}1–4).

Mêtra: **Womb**

Metron: **Measure**

Midriff (*phrenes*): See **Diaphragm**

Mimêsis: **Imitate, Imitation**

Mixolydian: See **Harmonies**

Mixture (*mixis*): Aristotle distinguishes between a mechanical mixture and a chemical one, which involves the formation of a new homogeneous stuff with new emergent properties: "*mixis* is the unification of mixable things when they have been altered" (*GC* 328^{b}22). A blend is a *mixis* particularly of liquids: "a *mixis* of dry things is not a blend" (*Top*. 122^{b}31).

Mnêmê: **Memory**

Mole (*mulê*): A uterine hydatidiform mole is a rare mass or growth that forms inside the uterus at the beginning of a pregnancy. It results from the abnormal fertilization of the egg, resulting in an abnormal fetus. There is little or no growth of fetal tissue. But the placenta grows in the usual way, eventually forming a mass of placental tissue. Molar pregnancies are discussed in *GA* 4.7.

Molunsis: **Parboiling**

Monarchy (*monarchia*): Rule by one person. Kingship is its correct, and tyranny its deviant, form.

Monas: **Unit**

Money (*nomisma*): Money (*nomisma*) is a medium of exchange, a unit of value, and a way of storing wealth for future use (*Pol*. 1.9). And "since it measures everything," it also measures excess and deficiency and how many shoes are equal to a house or food, and thus is "a sort of mean" (*NE* 1133^{a}20).

Monotokos: **One-offspring-bearing**

Monstrosity (*teras*): (1) "What is not like its parents is already in a certain way a monstrosity; for nature in these cases has in a certain way deviated from the kind" (*GA* 767^{b}5–6; also 770^{b}5). (2) "The monstrosity is among the things that are contrary to nature, not contrary to all nature, but the one that holds for the most part" (770^{b}9–11).

More and the Less, the (*to mallon kai to hêtton*)
The more and the less corresponds to our notion of degree, and so is connected to the notion of increasing and decreasing, tightening and loosening. As a musician tightens or loosens his instrument's strings until a certain target note is struck (*Pol*. 1290^{a}22–29), so it is too with vocal cords, sinews, and other string-like things (*GA* 787^{b}10–788^{a}6). As a result, Aristotle employs the notion of tightening and loosening wherever a certain tripartite structure is thought to exist, consisting of a continuous underlying subject, a pair of opposed affections that can vary in degree, and a target, typically a mean or intermediate condition of some sort, that can be achieved by tightening or loosening the underlying subject to change the degree of the affections. Consequently, he speaks of tightening and loosening in characterizing a wide range of phenomena, from the parts of animals to political constitutions (*Pol.* 1309^{b}18–31, *Rh*. 1360^{a}23–30).

In the case of noses and other such parts, the continuous underlying subject is flesh and bone, the pair of opposite affections is hooked and snub, and the target—which lies somewhere in between the two, and so (as in political constitutions) in a mean of some sort—is being a straight nose, or at the very least a nose of some sort. In the case of colors too, while many are constituted out of white and black in some definite ratio, others are constituted "with some excess and deficiency that is incommensurable" (*Sens*. 439^{b}30), and so are apt for tightening and loosening.

Because *to mallon kai to hêtton* is found in many different kinds, it cannot be the subject matter of any of the first-order sciences, since these are restricted to a single kind, but is instead studied by dialectic (*Top*. 114^{b}37–115^{a}24) and rhetoric (*Rh*. 1397^{b}12–27), which are kind-crossing—or trans-generic—sciences.

Most Part, for the (*hôs epi to polu*)
One might think that *hôs epi to polu* simply means "most" (Most As are Bs) in contrast to "all" (All As are Bs), but it does not. For, first, All As are Bs can hold for the most part—"for the most part, all [crabs] have the right claw larger and stronger than the left" (*HA* 527^{b}6–7)—as can universal laws (*NE* 1137^{b}15–16). Second, deductions with universal premises and conclusions remain valid even when these hold only for the most part (*APr*. 43^{b}32–36). But the corresponding deductions with "most" in place of "all" are not always valid: most centenarians are women; most women are under seventy; but no centenarians are under seventy. What is rather the case is that *hôs epi to polu* is a special sort of necessity with a special sort of explanation.

Aristotle associates what holds by unconditional necessity with what holds always: "'necessary' and 'always' go together (for what it is necessary for there to be cannot not be)" (*GC* 337^{b}35–36). He associates what holds *hôs epi to polu* with what rarely fails

to happen (*Top.* 112^{b}10–11), and attributes its existence to matter: "Nature . . . tends to measure comings to be and endings by the number of these revolutions [of the sun and moon], but cannot bring this about in an exact way because of the indefiniteness of matter, and because many starting-points exist that impede their comings to be and passings away from being in accord with nature, and often cause things to happen contrary to nature" (*GA* 778^{a}4–9).

Since the "indefiniteness of matter" seems to be a standing condition, while the "many starting-points . . . which impede" are not, we should presumably divide things up as follows. The indefiniteness of matter explains why laws or theorems of natural science hold *hôs epi to polu*, and so have contraries that are rarely true, while impediments explain why what otherwise would occur rarely may occur quite often. All human beings are two-footed, and this would still hold *hôs epi to polu* even if some freak accident or genetic disorder resulted in all or most human beings having only one foot. For even under normal conditions a human offspring may be born with only one foot simply due to facts about his father's seed (form) and his mother's menses (matter). Because "all human beings are two-footed" admits of exceptions—or of being otherwise—for these reasons, Aristotle says that the necessity it involves is not continuous (*APr.* 32^{b}6). What *hôs epi to polu* really means, then, is something like "it is a non-continuous or gappy necessity that." See **Form, Transmission of**

Mousikê: **Music**

Movement (*kinêsis*): (1) "The actualization of what is potentially, insofar as it is such, is movement" (*Ph.* 201^{a}9–10). (2) "Movement is the incomplete actualization of what is moveable" (257^{b}8–9). A *kinêsis* in this broad sense is a change (*metabolê*) of any sort. But sometimes it is more narrowly a change of place, so that a coming to be or a passing away is a *metabolê* but not a *kinêsis* (225^{b}7–9). See **Activity**

Mover, Primary (*prôton kinoun*): The immovable mover of everything else, identified with the primary god in *Met.* 12.7–9. The most detailed discussion is in *Ph.*7.1–2, 8.5–10, *Cael.* 292^{b}1–25 and 300^{b}21–25.

Muelos: **Marrow**

Multitude (*plêthos*): See **Majority**

Muraena (*smuraina*): A kind of eel.

Music (*mousikê*): The most detailed discussion is in *Pol.* 8.5–7.

Mutis: The liver (or hepatopancreas) in cephalopods.

Name (*onoma*): (1) When contrasted with a verb, an *onoma* is "a composite significant voiced sound, without a reference to time, no part of which is significant by itself" (*Po.* 1457^{a}10–12). Otherwise it is pretty much just a word. (2) In a stricter sense, an

onoma signifies an account or (in some cases) a definition (*Met*. 1012^{a}23–24, 1045^{a}26) of the form (1035^{a}21) or essence (1029^{b}20) of the thing named.

Nation (*ethnos*): A nation occupied a larger territory than a city (*polis*), had a larger population, and a looser political order. It did not need to have a single urban center and could consist of many scattered villages.

Natural Assimilation (*prosphusis*): A sort of growing together (*sumphusis*) that can lead to the formation of a natural unity (*Ph*. 227^{a}23–24, *Met*. 1014^{b}20–26), but also to such things as Siamese twins: most monstrosities are "due to embryos growing together" (*GA* 773^{a}3–4).

Natural Science (*phusikê*): A science is a natural science if the beings it deals with are "capable of being moved" and if the account of the essences of those beings "holds for the most part only, because it is not separable" (*Met*. 1025^{b}25–28), so that, like the snub, they are "grasped in combination with the matter" (1025^{b}32–33; also *DA* 403^{a}25–^{b}28). See **Most Part, for the**

Natural Science, Appropriate to (*phusikôs*): Often, opposed to logico-linguistic (*GC* 316^{a}10–11).

Natural Scientist (*phusiologos*, *phusikos*): The *phusiologoi* or *phusikoi* (*GA* 741^{b}10) were thinkers who tried to give a general account of reality that, among other things, made no reference to incorporeal beings: "They posit the elements of bodies alone, but not of the incorporeal things, although incorporeal ones are also beings. And when they try to state the causes of coming to be and passing away and to give a natural scientific account of all things, they do away with the cause of movement" (*Met*. 988^{b}24–26). Aristotle uses the terms for the most part to refer to the Ionian philosophers (Thales, Anaximander, Anaximenes, Heraclitus), Empedocles, and the Atomists (Democritus, Leucippus), in contradistinction to the Eleatics (Parmenides, Melissus) and Pythagoreans (*Ph*. 186^{a}20, 187^{a}12, 28, 205^{a}5, *Met*. 1078^{b}19).

Naturally Well-disposed (*euphuês*): Something is *euphuês* (contrary: *aphuês*) if it is well (*eu*) grown (*phuô*), or favored by nature in capacities, appearance, or some other respect: the situation of a bodily organ can be *euphuês* (*PA* 666^{a}14), as can that of a city (*Pol*. 1303^{b}8); an animal can be *euphuês* as regards a work, such as reproduction (*GA* 748^{b}8, 12), or the acquisition of a capacity, such as bearing the cold (*Pol*. 1336^{a}20) or becoming a poet (*Po*. 1455^{a}32) or a musician (*EE* 1247^{b}23). The sort that consists in possession of the natural virtues of character is the sort of natural good judgment (*euphuia*) that makes the end, and the deliberate choice of it, correct (*NE* 1114^{b}8, *EE* 1247^{b}40).

Nature (*phusis*)
Many of the things meant by *phusis* are discussed in *Met*. 5.4. But the term is used more widely than that discussion suggests. In the strict sense, a being that is or does something by nature has a nature—an internal starting-point of movement and rest

(*Ph*. 192^{b}13–14, *Met*. 1015^{a}13–15, *Cael*. 301^{b}17–18). The world of nature, investigated by natural science, is a world of such beings, all of which have perceptible matter as a constituent (*Met*. 1025^{b}30–1026^{a}6). This world is, roughly speaking, the sublunary one. Beyond it lies the world of the heavens studied by astronomy and theology (1026^{a}7–22), where beings either have no matter or matter of a different sort (*Cael*. 269^{b}2–6, 270^{b}19–25, *Mete*. 339^{b}25–27). Although, strictly speaking, many of these beings do not have natures, since "the proper order of perceptible things is nature" (*Cael*. 301^{a}5–6), Aristotle nonetheless speaks of them as if they do (298^{b}23, *Met*. 1026^{a}20, 25). We use the term "nature" in a similar way when we speak of the nature of the numbers or the nature of fictional entities, not meaning to imply at all that these things are parts of the natural world.

Sometimes, instead of using *phusis* to refer to the or a *phusis of* X, Aristotle uses the term and its plural *phuseis* to mean something we translate as "a nature" (Greek has no indefinite article) or "natures." The thing or things referred to may or may not have natures in the strict sense; they are pretty much just entities of some sort.

Aristotle also speaks of *phusis* in agentive terms, as when he says that nature produces nothing pointless or superfluous (*Cael*. 271^{a}33, *DA* 432^{b}21–22, 434^{a}31, *PA* 658^{a}8–9, 661^{b}23–24, *GA* 739^{b}19–20, 744^{a}36–37), does things correctly (*Cael*. 270^{a}20) like a craftsman (*PA* 654^{b}29–32, *GA* 775^{a}21–22), does "what is best from among the available possibilities for the substance of each kind of animal" (*IA* 704^{b}16–17), and corrects imbalances in contraries (*PA* 652^{a}31–33). But, as when he speaks of "the nature of the universe" (*Cael*. 268^{b}11) or "the nature of the whole" (*Met*. 1075^{a}11), it is not entirely clear how literally he is to be taken.

Nature, by (*phusei*)

Things that are "by nature are the ones whose cause is within themselves and is orderly" (*Rh*. 1369^{a}35–^{b}1), which cause is an internal starting-point of "moving and being at rest—some with respect to place, some with respect to increase and decrease, others with respect to alteration" (*Ph.* 192^{b}13–15). And each such thing is a substance: "things that have this sort of starting-point have a nature. And each of them is a substance; for they are a sort of underlying subject, and a nature is always in an underlying subject" (192^{b}32–34). Examples are "animals and their parts, plants, and simple bodies—for example, earth, fire, air, and water" (192^{b}9–11). Non-substantial phenomena, like the upward movement of fire, by contrast, though they occur by or in accord with nature, do not themselves have a nature: "And these things [that are by nature and have a nature] are also in accord with nature, as too is whatever belongs intrinsically to them, as spatial movement upward belongs to fire; for this neither is nor has a nature but is by nature and in accord with nature" (192^{b}35–193^{a}1; also *Cael*. 298^{a}27–^{b}1).

When substantial things do have a nature, moreover, it derives not from their matter but from their distinctive manner of composition, or form: "That is why, as regards the things that are or come to be by nature, although that from which they naturally come to be or are is already present [namely, the matter], we still do not say that they have

their nature if they do not have their form or shape" (*Met*. 1015^{a}3–5). A feline embryo thus has within it a starting-point that explains why it grows into a cat, why that cat moves and alters in the ways it does, and why it eventually decays and dies. A house or any other artifact, by contrast, has no such source within it; instead, "the starting-point is in something else and external" (*Ph*. 192^{b}29), namely, the understanding of the craftsman who produces it (*GA* 730^{b}11–19, *Met*. 1032^{a}32–^{b}10).

Nature, Contrary to: See **Force**

Necessary, Necessity (*anagkaion, anagkê*): Sometimes for A to be necessary is for not-A to be not possible, so that what is necessary cannot be otherwise (*Int*. 22^{b}3–10, *APo*. 71^{b}15, 73^{a}22, *Met*. 1015^{a}33–36). This sort of necessity is the unconditional necessity (*NE* 1139^{b}23–24) possessed by the eternal objects (gods, astronomical objects) of unconditional scientific knowledge. A weaker sort of necessity, in which the necessity is not continuous (*APr*. 32^{b}6), is possessed by things that hold for the most part, as in the case of all of the objects of natural science (*Met*. 1025^{b}28). A third sort of necessity is the hypothetical necessity, focally discussed in *Ph*. 2.9, where a certain sort of matter must be present if a certain compound is to have a certain form or work and achieve its end (also *PA* 642^{a}31–^{b}2). A fourth sort of necessity is the sort involved in a valid deduction, where the conclusion follows of necessity from the premises (*APr*. 24^{b}18–20), though the conclusion will not be necessary unless the premises are; in general, a conclusion can be no stronger than the weakest premise (*APo*. 1.30). All these sorts of necessity are contrasted with what is coincidental or a matter of luck (*APo*. 1.30, *Met*. 6.2–3). Though some of them stem from, or are grounded in, natures, forms, or essences, others are a matter of force, of being necessitated contrary to nature. In the case of actions and the like what is necessitated is compelled, or done under compulsion, and is contrasted with what is done voluntarily (*NE* 3.1).

Negation, Negative: See **Affirmation**; **Privation**

Nemesis: **Indignation**

Noble, Beautiful (*kalos*)
The adjective *kalos* is often a term of vague or general commendation ("fine," "beautiful," "good"), with different connotations in different contexts (*Top*. 106^{a}20–22). Similarly, the adverb *kalôs* often means something like "well" or "correct." Even in the general sense, however, *kalos* has a distinctive evaluative coloration suggestive of "order, proportion, and definiteness" (*Met*. 1078^{a}36–^{b}1), making a term with aesthetic connotation, such as "beauty," seem a good equivalent. Moreover, just as a thing need not have a purpose in order to be beautiful, a *kalon* thing can be contrasted with a purposeful one (*NE* 1125^{a}11–12).

At the same time, it seems wrong always to associate *kalon* with beauty in general, since to be *kalon* a thing has to be on a certain scale: "a *kalon* thing, whether a living being or any object composed of parts, must not only have these properly ordered, but also have a magnitude that is not random—for *kalon* lies in magnitude and order"

(*Po.* 1450^{b}34–37; also *NE* 1123^{b}6–8, *Pol.* 1326^{a}33–34). It is this requirement that makes "nobility" (in its more aesthetic sense) a closer equivalent than "beauty" in many cases.

In ethical or political contexts the canonical application of *kalon* is to ends that are intrinsically choiceworthy and intrinsically commendable or praiseworthy (*EE* 1248^{b}20–21)—and that, as such, are contrasted with things that are compulsory. In the same way, what is ethically *kalon* is contrasted with what is compulsory: "one should be courageous not because of compulsion . . . but because it is noble" (*NE* 1116^{b}2–4). It is because ethically *kalon* actions are intrinsically choiceworthy ends, indeed, that a good person can do virtuous actions both because of themselves (*NE* 1105^{a}32) and for the sake of what is *kalon* (1115^{b}12–13). But *kalon* actions also exhibit the sort of order (1180^{a}18), commensurability or proportionality (1104^{a}18), and determinateness (1106^{b}30, 1170^{a}20) that consists in lying in a mean between two extremes. This brings us full circle, connecting what is ethically *kalon* to what is aesthetically noble, lending the former too an aesthetic tinge.

Finally, what is ethically *kalon* includes an element of self-sacrifice that recommends "nobility," in its more ethical sense, as often a good equivalent for it as well (*NE* 1169^{a}18–22). One reason people praise a *kalon* agent, indeed, is that his actions benefit them (*Rh.* 1366^{b}3–7). But since what is *kalon* is a greater good than those an excellent person gives up or confers on others, there is also a strong element of self-interest in what he does: "The greater good . . . he allocates to himself" (*NE* 1169^{a}28–29). An excellent person does *kalon* actions for their own sake, not for an ulterior motive, because it is only as done in that way that they constitute the doing well in action (*eupraxia*) that just is happiness.

Noble-goodness (*kalokagathia*): Noble-goodness in the strict sense is complete virtue of character. The focal discussion is *EE* 1248^{b}9–1249^{a}17. The term is used elsewhere (*NE* 1124^{a}4, 1179^{b}10, †*MM* 1207^{b}23, *Pol.* 1259^{b}34) with the same sense but with less fanfare. The associated adjectival pair *kalos kagathos* ("noble-and-good") is found, e.g., at *NE* 1099^{a}6, 22, *Pol.* 1270^{b}24, 1271^{a}23, 1293^{b}39, 42, 1294^{a}18, *Ath.* 28.5.

Noêma: **Intelligible Object**

Nomes (*nomoi*): Solo competition pieces: songs accompanied by the singer on a lyre; instrumental solos for the lyre; songs accompanied by the pipe; and instrumental solos for the pipe.

Nomisma: **Money**

Nomos: **Law**

Nomothetês: **Legislator**

Nomothetikê: **Legislative Science**

Nourishment (*trophê*): See **Concoction**

Nous: **Understanding**

Now, the (*to nun*): Focally discussed in *Ph*. 6.3. See **Time**

Number (*arithmos*): The numbers we count with (1, 2, 3 . . .) and the things we count (4 shoes, 2 pairs of shoes) are distinguished at *Ph*. 219^{b}5–8, 220^{b}20–22.

Objection (*enstasis*): (1) "An objection is a premise contrary to a premise" (*APr*. 69^{a}37). (2) "Premises from which it is possible to deduce a contrary result are also those from which we try to state objections" (69^{b}28–29). (3) Objections are brought "in four ways: based on itself, on what is similar, on what is contrary, or on what has been judged" (*Rh*. 1402^{a}34–37). See *Top*. 161^{a}1–15.

Ocheuein, *ocheuesthai*: **Mates, Is Mated**

Offspring (*tokos*): A *tokos* is a child or, more generally, an offspring. *Tokos* also means giving birth.

Oikeios: **Proper**

Oily: *Liparos*

Oligarchy (*oligarchia*): A deviant form of aristocracy, where the rich, whether few (as is usually the case) or many, rule for their own advantage (*Pol*. 1279^{b}7–8), so that it is the rule that "exists because of wealth and power" (*NE* 1161^{a}2–3).

Oligôria: **Contempt**

Oligotokos: **Few-offspring-bearing**

On: **Being**

On Nourishment: Or *On Growth and Nourishment*. Referred to at *DA* 416^{b}31, *GA* 784^{b}2, *PA* 650^{b}10, 674^{a}20, 678^{a}19, and perhaps *Mete.* 381^{b}13, *PA* 653^{b}14.

One (*hen*): A and B can be one (or the same) in different ways: numerically, in form, or in kind (*Top*. 103^{a}6–14), or in being (*Ph*. 202^{b}14–16). Things can be the same in one of these ways without being the same in another: politics and practical wisdom are the same state, but they are not the same in being (*NE* 1141^{b}23–24); the underlying subject that comes to be something, while it may be one in number, cannot be one in form or account (*Ph*. 190^{a}15–17). Being one in number is distinctive of particular this somethings (*Cat*. 1^{b}6, 3^{b}10–13, *Met*. 999^{b}34–1000^{a}1, 1040^{b}9–10, 1086^{b}26).

One, the: (1) "Nature as a whole" (*Met*. 984^{a}31). (2) The Pythagorean one, which is "both odd and even" (986^{a}19–20). (3) The immovable one of Parmenides and his followers (*Ph*. 1.2, *Met*. 986^{b}18–987^{a}2). (4) The Platonic one (*Met*. 987^{b}20–22, 987^{b}29–988^{a}14). (5) The unit of measurement (10.1–2).

Onoma: **Name**

Open-structured: See **Condensation and Rarefaction**

Opportune Moment, Crisis: *Kairos*

Opposite (*antikeimenon*): "Things said to be opposites include contradictories, contraries, relatives, privation and having, and the extremes that comings to be and passings away are from and to. And all things that cannot be present at the same time in what is receptive of both are said to be opposed—either themselves or their components" (*Met*. 1018^{a}20–24). See **Privation**

Opson: **Gourmet Dish**

Ordinary People, the Many (*hoi polloi*): Aristotle sometimes uses *hoi polloi* to refer simply to a majority of people of whatever sort—to most people. Often, though, he uses it somewhat pejoratively to refer to the unrefined masses (*NE* 1095^{b}16 and throughout *Ath*., where it is "the many") in contrast to cultivated, sophisticated, or wise people. "Ordinary people" seems often to convey the correct sense.

Orexis: **Desire**

Organon: **Instrument**

Orgê: **Anger**

Ostrakodermos: **Hard-shelled Animal**

Ousia: **Substance**

Outline, Imprint (*tupos*): (1) Sometimes when Aristotle gives an outline, it means that a fuller account is possible, but not desirable, given the goals of the inquiry. But sometimes, as when things in a given area hold for the most part (*NE* 1104^{a}1–5), it seems that the truth about them *must* be stated in outline (*tupô[i]*). In this case, having to treat things in outline seems to be a function of the subject matter, so that it is because we are discussing things that hold for the most part in ethics and politics that these sciences involve outlining. (2) A *tupos* is also the imprint of a perception that constitutes a memory (*Mem*. 450^{a}31).

Oxfish (*bous*): Cartilaginous fish; one of the selachians.

Oxu: See **Sharp and Dull**

Pachus: **Coarse-grained**

Paideia: **Education**

Paiderasteia: **Boy Love**

Pale: See **White**

Pan, to: **Universe, the**

Pancration: A mixture of boxing and wrestling combined with kicking and strangling.

Para: **Beyond**

Paradigm (*paradeigma*): (1) A rhetorical induction (*APr*. 2.24, *Rh*. 1356^{b}3, *EE* 1216^{b}28). (2) A form (*Ph*. 194^{b}26, *Met*. 1013^{a}27). (3) An example or paradigm case (*Top*. 105^{b}28, 151^{b}20, *GA* 746^{a}14, *EE* 1220^{b}36, *Met*. 995^{a}7, *NE* 1102^{a}10, 1160^{b}23). (4) What a Platonic Form is taken to be (*Met*. 991^{a}21, 1034^{a}2, *NE* 1097^{a}2).

Paradoxos: **Unacceptable**

Paralogismos: **Fallacy**

Parboiling (*molunsis*): "Parboiling is the [sort of] unconcoction that is contrary to boiling. And so the contrary of boiling, and what is called 'parboiling' in the primary sense, would be non-concoction of the indefinite [matter] in the body due to a deficiency of heat in the surrounding liquid" (*Mete*. 381^{a}12–24).

Paronymously (*parônumôs*): "Things are said to be paronymous in case one gets its name from the other with some difference depending on derivation—for example, the grammarian gets his name from grammar, the courageous person from courage" (*Cat*. 1^{a}12–15). Paronymy is not simply a linguistic phenomenon, but also an ontological one, since it is things that are paronymously related not names. The definition of a rash person is thus a person in whom rashness is present, and of a grammarian, a person in whom the knowledge of grammar is present.

Part (*meros*, *morion*): (1) Some parts are uniform, in that they are of the same form as the whole (as parts of water are water and parts of flesh flesh). Others are non-uniform (as parts of the hand are not hands) (*GC* 314^{a}20, 328^{a}10–12, *Mete*. 389^{b}23–28, *PA* 640^{b}20, *GA* 715^{a}8–11). (2) Some are parts of the form of a compound, others parts of the matter (*Ph*. 200^{b}4–8, *Met*. 7.10–11). (3) Some are working parts, that cannot survive (except homonymously) in separation from the working whole, as a separated, non-working hand is a hand in name only (*PA* 640^{b}33–641^{a}6, *Met*. 1035^{b}14–25, *Pol*. 1253^{a}20–25). (4) Parts of substances are sometimes classed as substances (*Cat*. 3^{a}29–32, *Cael*. 298^{a}30–31, *Met*. 1017^{b}10–21, 1018^{b}8–15), but when substance is identified with form, this may no longer be true (*Met*. 1039^{a}3–8, 1040^{b}5–16). See **Soul, Parts of**

Participate (*metechein*): The specifically Platonic relation between particulars and Platonic Forms (*Met*. 987^{b}9, 990^{b}28, 991^{a}21, 992^{a}28, 1031^{b}18, 1079^{a}25, ^{b}25), between Forms themselves (987^{b}21), but also used more generally (*DA* 406^{a}12, 21, 412^{a}15, *Met*. 1030^{a}13, 1037^{b}18, 1039^{b}2, 1045^{b}8, 1075^{a}35).

Particular (*kath' hekaston*): See **This**; **Universal**

Passing Away (*phthora*): See **Coming to Be**

Pathos: See **Affection**

Patrikê: **Fatherhood, Science of**

Patron (*chorêgos*): A rich Athenian who paid for a chorus as part of his public service. See *Ath*. 56.3.

Pêgnunai: **Solidify**

Peirastikê: **Examinational**

Pelamys (*pêlamus*): Variety of tuna.

Pentathlon: Competition comprised of running and jumping, throwing the discus and javelin, and wrestling.

People (*dêmos*): The *dêmos* is the class that rules in a *dêmokratia* ("democracy"), also sometimes called a *dêmos*. It typically consists of the poorer people in the city. The term often refers to democracy itself.

Pepaideumenos: See **Education**

Pepsis: **Concoction**

Peras: **Limit**

Perceptible (Object) (*aisthêton*): Perceptible objects (or perceptibles) are discussed in *DA* 2.6 and are either special to a single perceptual modality, as colors are special to sight, or common to a number of perceptual modalities, as shape can be both seen and felt.

Perception (*aisthêsis*)
The noun *aisthêsis* sometimes refers to a perceptual modality (or sense), such as sight or smell, sometimes to the activity of perceiving some perceptible object. Perception proper encompasses the special perceptual modalities (sight, smell, hearing, taste, and touch), whose primary objects are special perceptibles, such as colors, odors, sounds, and so on, which only a single perceptual modality can detect. But it also includes the common perceptual capacity—or so-called common sense (*DA* 431^{b}6, *Mem*. 450^{a}10–11)—which is the "something" responsible for the awareness of the activity or inactivity of the various special perceptual modalities (*DA* 425^{b}12–26).

The common perceptual capacity is responsible too for the simultaneous perception of two or more special perceptibles in a single act, the perception of two or more proper perceptibles as distinct, the control of waking up the special perceptual modalities or letting them sleep (*Somn*. 455^{a}12–26), and perhaps also the perception of common perceptibles (*koina aisthêta*)—which are accessible to more than one perceptual modality—such as change, rest, shape, size, number, unity, and perhaps others (*DA* 425^{a}13–20).

When we perceive something, as when we beget offspring, what is central to the process is the transmission of form without matter: "Speaking in universal terms about every perceptual modality, one must grasp that the perceptual modality is

what can receive the perceptible forms without the matter, as wax receives the seal of the signet ring without the iron or the gold; it takes on a golden or brazen seal of a signet ring, but not insofar as it is gold or bronze" (*DA* 424^{a}17–21; also 425^{b}23–24). Likewise, memory involves the retention of form without matter (*Mem*. 450^{a}30–32).

Perceptual Affection (*aisthêma*): A perceptual affection is the appearance of a perceptible object retained in memory or present in imagination or in dreams (*APo*. 99^{b}37, *DA* 431^{a}15, 432^{a}9, *Mem*. 450^{a}31, *Somn*. 456^{a}26, 460^{b}29, *Insomn*. 460^{b}2, 29, 461^{a}19, 27, 461^{b}22, 462^{a}30, *Met*. 1010^{b}32, 1063^{b}4).

Perceptual Modality (*aisthêsis*): The five perceptual modalities (or senses) are sight, hearing, smell, touch, and taste. These are focally discussed in *DA* 2.7–11. A perceptual modality's exactness is determined by the "purity" of—the absence of heavy earth in—the associated perceptual organ: the less earthen or corporeal the perceptual organ is, the more easily it is moved by small differences in the perceptible object. The organ of touch, however, involves the flesh as a whole as well as the perceptual organ proper, which lies near the heart (*Sens*. 439^{a}1–2).

Perceptual Organ: *Aisthêtêrion*

Perceptual Part, Perceptual Capacity (*aisthêtikon*): The element in the soul in virtue of which an animal is capable of perceiving. In *DA* 3.4 *to aisthêtikon* is "what is capable of perception." See **Soul, Parts of**

Perhaps, Presumably (*isôs*): *Isôs* sometimes signals tentativeness, sometimes a presumption or probability that something is the case.

Perineon: (1) The part between the anus and scrotum, or anus and vagina (*HA* 493^{b}9), i.e., the perineum. (2) The instrumental part that is special to the male and the counterpart of the uterus in the female, i.e., the penis (*GA* 716^{a}33 and 766^{a}3–5).

Peripeteia: **Reversal**

Perittôma: **Residue**

Pêrôma: **Disability**

Perspicuous, Perspicuousness (*saphês*, *saphêneia*): (1) *Saphêneia* is associated with explanation, which is ultimately from starting-points: "On the basis of what is truly but not perspicuously stated, we will make progress toward perspicuousness, always substituting what is more knowable for what is usually expressed in a confused way. . . . That is why even politicians should not regard as superfluous the sort of theoretical investigation that makes evident (*phaneron*) not only the that but also the why" (*EE* 1216^{b}33–40). The same point is made at *NE* 1098^{b}7–8 by noting that when we have a correct definition of the starting-point, much else at the same time "will become evident (*sumphanê*) through it." *Saphês* and *akribês* ("exact") are often equivalent in

meaning (*Top.* 111^{a}8–9). (2) In a less technical sense *saphês* means "evident" or "clear" (*PA* 661^{a}2).

Persuasion, Means of (*pistis*)

The means of persuasion, which are of cardinal importance in rhetoric, are divided into two classes: (1) some are "outside the province of craft," while others are (2) "within the province of craft" (*Rh.* 1355^{b}35–36).

Those in (1) are special to judicial oratory and there are just five of them: "laws, witnesses, contracts, [results of] torture, and oaths" (*Rh.* 1375^{a}24–25). None of these is a deduction, demonstration, or argument of any sort. This distinguishes them from the means of persuasion that are within the province of craft, which are arguments (1354^{a}12). What they have in common is that they are probative items—items productive of persuasion, or conviction (another meaning of *pistis*): a witness, a contract, or an oath (at least in places where oaths are taken seriously) can be as probative as an argument. What puts these outside the province of craft is not just the fact that they are not arguments, however, but that the craft of rhetoric is not in a position to provide them: they are either there for it at the start or they are not.

In the case of (2), we may distinguish the logical aspects of a means of persuasion from other aspects. From the logical point of view a means of persuasion is a certain sort of deduction or demonstration, and, as such, is no different from any other deduction or demonstration. That is why rhetoric is in part "composed of the science of analytics" (*Rh.* 1359^{b}9–10): it draws its logic from there. What makes a demonstration or deduction a peculiarly rhetorical one—an enthymeme (1355^{a}6, 1256^{b}3)—is not its logic, therefore, but something else, namely, the shape the deduction takes and what it is based on, both of which are dictated by the special goals or purposes of rhetoric.

A primary deduction (*Rh.* 1357^{a}17) is the analog of a dialectical deduction: as the latter lies in the background guiding in the one case the questioner's questions, in the other the answerer's answers, so the primary deduction lies in the background guiding the speaker's enthymeme. And, again like a dialectical deduction, a primary deduction is a syllogistic deduction, or chain of such deductions. By contrast, the enthymeme that the speaker actually presents to his listeners is sculpted to accord with their beliefs (if they know a premise, there is no need to state it), with their capacity to follow long chains of deductions, their level of education, and so on (1395^{b}23–1396^{a}3). In this regard enthymemes are no different from deductions used for other productive or practical purposes (*MA* 701^{a}27–28). An actual enthymeme, then, is always the tip of a deductive iceberg, just enough of which it exposes to achieve its end. But while a speaker "should compress enthymemes as much as possible" (*Rh.* 1419^{a}19), that does not mean that he will never have to expose the whole iceberg.

None of this implies that primary deductions are always explicitly articulated by speakers, or that speakers work from them, as from an explicit recipe, to which they have access. They may be—and no doubt usually are—further removed from actual practice than that. What they do is make fully explicit to students of rhetoric what

is needed in order to rationalize or make fully intelligible what skilled speakers are doing when they argue as they do. They articulate part of the craft knowledge—the competence—of a skilled speaker but not necessarily by giving the protocols he actually follows.

Though their logic is that of deductions generally, enthymemes, like dialectical deductions, are not categorical ones, of the sort found in the sciences, which prove their conclusions unconditionally, but so-called hypothetical ones: "a probative enthymeme draws its conclusion from what is agreed to" (*Rh*. 1396^{b}26–27; also *APr*. 41^{a}38–^{b}1, 45^{b}17–19). But as with their length or degree of compression, this seems to be typically, rather than essentially, true of them (*Rh*. 1358^{a}23–26): the premises of enthymemes may be scientific starting-points even though rhetoric does not select them as such (which is why the speaker who selects them is unaware of the fact that he is doing a bit of science), but on other grounds altogether. (Understood in the way we have been discussing, enthymemes are further divided into two forms: probative and refutative (1396^{b}23–25). But while these differ in their popularity (1400^{b}25–33), they are not two distinct sorts of deductions, but rather the very same one used for distinct purposes (1403^{a}25–29). There is nothing formally or logically distinctive about them, therefore, that requires special notice or discussion.)

What is true of enthymemes formally or logically is also true of what they are based on, namely, "such common things as are, in a way, known to all and belong to no definite science" (*Rh*. 1354^{a}1–3). Later these are identified as including topics (1358^{a}10–12). Then topics themselves are identified with elements of enthymemes. Then both elements and topics are described as items "into the province of which many enthymemes fall" (1403^{a}19). See **Topic**

Phainesthai: **Appear**

Phainomena: **Appear to Be So, Things That**

Phantasia: **Appearance, Imagination**

Phantasma: **Appearance**

Phantastikon: **Imaginative Part**

Phasis: **Phrase**

Phaulos: **Base**

Phiditia: **Communal Messes**

Philanthrôpia: **Fellow Feelings for Human Beings**

Philautia: **Self-love**

Philêton: **Love, Object of**

Philos: **Friend**

Philosophy (*philosophia*): Aristotle sometimes applies the term *philosophia* to any science aiming at truth rather than action (*Met.* 993^{b}20). In this sense of the term, all the broadly theoretical sciences count as branches of philosophy, and *philosophia* is more or less equivalent in meaning to *epistêmê* ("science"). *Philosophia* also has a narrower sense, however, in which it applies exclusively to sciences providing knowledge of starting-points. "Natural science and secondary philosophy" thus has the task of providing theoretical knowledge of the starting-points of perceptible substances (*Met.* 1037^{a}14–15), whereas the immovable starting-point is "work for the other and prior philosophy to discuss" (*GC* 318^{a}6). Since there are just "three theoretical philosophies, mathematical, natural, and theological" (*Met.* 1026^{a}18–19), theological philosophy must be primary, mathematical philosophy tertiary (although it is not ever referred to as such). Primary philosophy is the science of being qua being (*Met*. 1026^{b}29–32). Besides these theoretical philosophies, Aristotle occasionally mentions practical ones, such as "the philosophy of human affairs" (*NE* 1181^{b}15). It is among these that his own ethical writings belong (*Pol.* 1282^{b}19–20).

Phlegm (*phlegma*): "A residue from the useful nourishment" (*GA* 725^{a}16).

Phleps, *phlebion*: **Blood Vessel**

Phôlein: **Hiding, Going into**

Pholidôtos: **Hard-scaled**

Phônê: **Voice**

Phora: **Spatial Movement**

Phortikos: **Unrefined**

Phrase (*phasis*): (1) A *phasis*, like an affirmation, can be the object or content of a mental or speech act. In this sense it is a (possibly one-word) phrase that, like a name or verb (*Int*. 17^{a}17), is significant by itself (16^{b}26–28). (2) In a related sense a *phasis* is the mental or speech act itself of phrasing or putting into words, and may be the giving of an account or definition of an essence or incomposite substance: "As regards the incomposite things . . . truth or falsity consists in this—to touch and to phrase are true (for an affirmation and a phrase are not the same), but to be ignorant is not to touch. For it is not possible to be mistaken about the what-it-is, except coincidentally; and the same holds with regard to incomposite substances, for it is not possible to be in error about them; and they are all active, not potential, for otherwise they would have come to be and passed away" (*Met*. 1051^{b}17–29). The idea is this. When we actively understand an essence or an incomposite substance, we do not do so by predicating something of something, because an essence or substance of the relevant sort is a form (an actuality or activity), not a form said or predicated of matter (1043^{b}29–32). What happens instead is that as a result of being grasped by the understanding the essence or substance is phrased (put into words) or defined. For it is the essence or substance itself and not

a representation of it that the understanding grasps: "in the case of those things that have no matter, what understands and what is understood are the same; for theoretical scientific knowledge and what is known in that way are the same" (*DA* 430^{a}3–6). That is what makes touching the appropriate analog. For while we might think that we see not material objects, but their colors and shapes, we do not think parallel thoughts about touching. See **Truth**

Phratra: See **Tribe**

Phrenes: See **Diaphragm**

Phronêsis: **Wisdom, Practical**

Phtheirein, *phthora*: See **Coming to Be**

Phulê: See **Tribe**

Phusikôs: **Natural Science, Appropriate to**

Phusiologos, phusikos: **Natural Philosopher, Natural Scientist**

Phusis: **Nature**

Physical Training (*gumnastikê*): *Gumnastikê*, when provided by a trainer (*gumnastês*, *gumnastikos*), aims to produce a "good physical condition" (*NE* 1138^{a}31; also *EE* 1218^{a}35); when provided by a coach (*paidotribês*), it includes more focused training aimed to inculcate specific physical skills, including athletic and military ones (*Pol*. 1338^{b}6–8).

Pimelê: **Fat**

Pinnae (*pinnai*): The *Pinna nobilis* or fan mussel is a species of large Mediterranean clam.

Pipe (*aulos*): (1) A reed instrument (*HA* 565^{a}24), rather like a modern oboe. "Flute" is the standard but misleading translation. *HA* 581^{b}10–11 refers to "maiden's pipes" and "boy's pipes," which may have been pipes with different pitches. *Pol.* 1342^{b}1–6 discusses a pipe's effects. (2) A duct in the body (*GC* 322^{a}29, *HA* 489^{b}3, 513^{b}6). (3) The blowhole pipe in a whale or dolphin (*HA* 489^{b}3).

Pistis: **Persuasion, Means of**

Pity (*eleos*): "A sort of pain at an apparently destructive or painful bad thing happening to someone who does not deserve it, and one that a person might expect himself too or one of his own to suffer, and this when it appears close at hand" (*Rh*. 1385^{b}13–16). It is made significant use of at *Po*. 1449^{b}27, 1452^{a}3, 1452^{a}38. See **Purgation**

Place (*topos*): "The limit of the encompassing body at which it is in contact with what is encompassed. (By 'what is encompassed' I mean a body that can be moved by way of spatial movement)" (*Ph*. 212^{a}5–6a).

Place, Proper (*oikeios topos*)
In the case of sublunary animals, up and down, front and back, right and left are not just spatially or relationally distinguished but functionally and absolutely so: "the up and the down are distinguished by [their] work, and not only with respect to their position relative to the earth and the heaven. For where the distribution of nourishment and growth is from in each, this is the up; and where it, ultimately, comes to an end, this is the down. For the one is a sort of starting-point, the other a sort of end-point; and the up is a starting-point" (*IA* 705^{a}32–^{b}2). Similarly, the front is a starting-point, because it is where the perceptual organs are located (705^{b}10–13). Even in earthworms, where right and left are more difficult to distinguish perceptually, the functional difference between them still exists: "the starting-point from which movement derives is the same for all of them, and has its position in the same place in accord with nature. The right is indeed the starting-point from which movement derives" (706^{a}10–13): human beings put their left foot forward, unless they accidentally do the opposite, since "they move not with the part they put forward but with the one with which they step off" (706^{a}8–9).

In the case of the universe, the same applies not just to right and left but to all six functionally defined directions (*Cael.* 285^{a}31–^{b}8). It is these functionally defined directions that determine unconditional or absolute locations or places in the universe: "every perceptible body is in a place, and the forms and differences of place are up and down, before and behind, and right and left. And these are not merely relative to us or to our position, but are also distinguished within the whole universe itself" (*Ph.* 205^{b}31–34). The place that is unconditionally up, as opposed to being up relative to something else, is thus at the periphery of the universe; the one that is unconditionally down is at its center (*Cael.* 308^{a}17–29).

It is absolute places, in turn, that figure in the essential definitions of the five elements, making them the closest analog of form that these elements possess: "this is what is being inquired about: why it is that the light and the heavy do move to their own place. And the cause is that it is natural for them to be somewhere, and this is the being for the light and the heavy, the one being determined by up and the other by down" (*Ph.* 255^{b}13–17). Earth is thus what is unconditionally heavy, since unless it is opposed, it naturally moves toward the place at the center. The center of the universe, therefore, is its proper place—the place where it would be unless something else prevented it.

Pleasure (*hêdonê*)
(1) "Pleasure is a sort of movement of the soul, an intensive and perceptible settling down into its original natural state, and pain the contrary" (*Rh.* 1369^{b}33–35). (2) Pleasures are "activities and an end" (*NE* 1153^{a}10). (3) "Pleasure is what completes the activity . . . not as the state does by being present in something but as a sort of supervenient end, like the bloom on those in their prime" (1174^{b}23–33). (1) is the sort of generally acceptable view of pleasure suitable for rhetoricians to learn; it need not be taken as expressing Aristotle's own view, which is expressed in (2) and (3). These, however, appear to conflict: in (2) pleasure is identified with the activity itself, not—as in (3)—with the supervenient end that completes the activity.

Aristotle's primary god, however, who is a simple and entirely immovable being (*Met*. 1072^{a}21–^{b}1), whose one activity, to which he is identical (1072^{b}27), is "a pleasure" (1072^{b}16). In his case, therefore, that pleasure must just be the activity that he is. But what is true of him is that his activity is always and necessarily "the activity of the subject that is in good condition in relation to the most excellent of its objects" (*NE* 1174^{b}22–23). For "active understanding is intrinsically of what is intrinsically best, and the sort that is to the highest degree best is of what is to the highest degree best" (*Met*. 1072^{b}18–19), and "the god is a living being who is eternal and best" (1072^{b}28). This is obviously not true of human beings. For even when their state is in good condition and in relation to the most excellent of its objects, its activity may be disrupted or impeded, and so is not guaranteed even then to be pleasure. This disruption or impedance, moreover, may come from within the human soul itself (*NE* 1154^{b}20–31, 1175^{a}3–10).

It seems reasonable to suppose that Aristotle introduces supervenient ends to register this difference between the god's pleasure and a human being's. (Notice the parallel conclusion about the happy life at *NE* 1101^{a}20–21.) A man in his prime is the analog of the state in the best condition. His bloom, which is the analog of pleasure, is present when the man is actively and unimpededly bloom*ing*. (2) identifies pleasure with unimpeded activity; (3) explains the precise nature of the non-impedance.

Pleonektos: **Get More, One Who Tries to**

Plêthos: **Majority**

Pneuma: **Breath**

Poetry, Craft of (*poiêtikê*): The craft of producing poetry, including epic poetry, tragedy, comedy, and so on (*Po*. 1447^{a}8). The *Poetics* is a methodical inquiry into this craft.

Poiein: **Produce**

Poiêtikê: **Poetry, Craft of**

Point (*stigmê*): (1) "What is indivisible in quantity, when it is indivisible in all dimensions and lacks position, is said to be a unit, and when it is indivisible in all dimensions and has position, a point" (*Met*. 1016^{b}24–26). (2) "Points are cuts or divisions of lines" (1060^{b}13–15).

Poion: **Quality, Sort of Thing**

Polis: **City**

Politeia: **Constitution, Polity**

Politeuma: **Governing Body of a Constitution**

Political Animal (*politikon zô[i]on*): See **Human Being**

Political Club (*hetaireia*): Thucydides 8.54.4 mentions "sworn associations which already existed in Athens for mutual support in lawsuits and in elections." To a

certain extent these are the equivalent of the *hetaireiai* mentioned, e.g., at *Pol.* 1305^{b}32. But *Ath.* 34.3 mentions "the notables in the *hetaireiai* . . . who wanted an oligarchy," contrasting them with others "who did not belong to any *hetaireia*, but were in other respects reputable citizens" and who "aimed at restoring the ancestral constitution."

Politician (*politikos*): A *politikos* is someone who rules a city, or holds political office in it, using, in the best case, his knowledge of political science, and, in the less than best case, some—perhaps very distant—approximation to it. See F90 54.10–56.10.

Politics (*politikê*): (1) *Politikê* is the practical science used in ruling a city (*NE* 1099^{b}29–32, 1102^{a}18–25, 1103^{b}3–6, 1152^{b}1–3, 1180^{b}23–1181^{b}23). For this reason, it is the most architectonic and most controlling science (1094^{a}26–^{b}7). (2) It comprises legislative science, deliberative science, and judicial science (1141^{b}32–33), but also a part concerned with particular cases, and the decrees suited to them (1141^{b}26–28). (3) It is the same state of the soul as practical wisdom, but differs in being: practical wisdom is more directed toward the good of the individual, politics more toward the good of the city as a whole (1141^{b}24–26).

Polity (*politeia*): Aristotle gives a number of different accounts of what a polity is: (1) a constitution ruled by the majority for the common advantage (*Pol.* 1279^{a}37–9); (2) a mixed constitution (1293^{b}33–34, 1294^{a}22–23); (3) a constitution that depends on the middle class (1295^{b}34–1296^{a}9); (4) a constitution that depends on the hoplite or warlike class (1265^{b}26–28, 1288^{a}12–15, 1297^{b}1–2). The nature of the mixture mentioned in (2) is also variously characterized: (2.1) a mixture of democracy and oligarchy (1293^{b}34, 1307^{a}10–12); (2.2) a mixture of the rich and the poor, wealth and freedom (1294^{a}16–17); (2.3) a mixture of elements drawn from democratic and oligarchic constitutions (4.9). Aristotle never explicitly identifies a polity with the middle constitution described in 4.11 (except perhaps at 1297^{a}3–40), but for the following reasons it seems that the latter just is a (well-mixed) polity: (1) There are just six types of constitutions: kingship, aristocracy, polity, democracy, oligarchy, and tyranny (1289^{a}26–30). Hence the middle constitution must be one of these. What could it be besides a polity? (2) A well-mixed polity is in the middle between an oligarchy and a democracy (1294^{b}14–18), so is the middle constitution (1296^{a}22–40). Since there cannot be two middles between two extremes, the middle constitution must be a well-mixed polity.

Polutokos: **Many-offspring-bearing**

Popular Leader (*dêmagôgos*): Occasionally, *dêmagôgos* is a neutral term used to describe an influential democratic leader, such as Pericles (*Pol.* 1274^{a}10), but more often it has a negative connotation, referring to those who act as popular leaders of the people and undermine the rule of law (1292^{a}4–37) in order to gain power.

Poreia: **Progression**

Poros: **Duct**

Positive (*katêgorikos*): When applied to a premise or a deduction the adjective *katêgorikos* seems to be an antonym of **Privative**.

Possible (*endechesthai*): (1) "Things are said to be possible in many ways—for we say that what is necessary is possible, and also that what is not necessary is, and also that what is potential (*dunaton*) is" (*APr*. 25^{a}37–39). (2) "I use the expressions 'to be possible' and 'what is possible (*endechomenon*)' of whatever is not necessary but, when it is supposed to be the case, nothing will be impossible (*adunaton*) because of this (for we say that what is necessary is possible homonymously)" (32^{a}18–21). (3) "It is possible for something to be capable of being and yet not be, or capable of not being and yet be, and similarly for the other categories—to be capable of walking and yet not walk, and to be capable of not walking and yet walk. A given thing is capable if nothing impossible (*adunaton*) follows from the assumption that the activity it is said to have the capacity for belongs to it. I mean, for example, if a thing is capable of sitting and it is possible for it to sit, if sitting should belong to it, there will be nothing impossible occurring" (*Met*. 1047^{a}20–28). In general, *endechestai* and *dunatos* do not differ significantly in meaning. See **Capacity**; **Necessary**

Postulate (*aitêma*): "A postulate is contrary to the learner's belief, or is something which, though demonstrable, one assumes and uses without demonstrating" (*APo*. 76^{b}32–34). The term is often used more loosely.

Potential, Potentiality: See **Activity**; **Capacity**

Pous: **Foot**

Power: See **Capacity**

Practical (*praktikos*): When *praktikos* marks a contrast with *theôrêtikos* it is "practical" while *theôrêtikos* is "contemplative," when applied, as to a type of life or activity (*EE* 1249^{b}14), but "theoretical" when applied to a type of science or thought (1216^{b}11). While in many ways apt, this opposition is also somewhat misleading. For what makes something practical for Aristotle is that it involves *praxis* or action considered as an end choiceworthy because of itself (so sometimes it is "action-involving"), and not—as with "practical"—that it is opposed to what is theoretical, speculative, or ideal. Hence theoretical activities are more practical than those that are widely considered to be most so: "It is not necessary, as some suppose, for a practical life to be in relation to other people, nor are those thoughts alone practical that arise for the sake of the consequences of doing an action; much more practical are the acts of contemplation and thought that are their own ends and are engaged in for their own sake; for doing well in action (*eupraxia*) is the end, and so action of a sort is the end too" (*Pol.* 1325^{b}16–21). If some things are practical because they are useful, effective, or feasible means to some end, then, others are yet more practical because they further an end by constituting it or being identical to it (*EE* 1217^{a}35–40).

Pragmateia: **Study, System**

Praiseworthy (*epainetos*): We praise an ethical agent or a runner not just for being of a certain quality (virtuous, in good athletic condition) but for doing something as a result of it that we value as good or excellent, such as winning a race for our city or country or doing a courageous action in its defense (*NE* 1101^{b}15–16). See **Noble, for the Sake of the**

Prakton: **Action, Doable in**

Praxis: **Action**

Pray, Prayer (*euchesthai*, *euchê*): Though his gods lead strictly contemplative lives (*NE* 1178^{b}7–22, *Met*. 1074^{b}34–35) and so are unaware of our existence, Aristotle sometimes speaks of prayer in an intercessory way, and in some texts tells us how to pray and what to pray for (*NE* 1118^{a}32, 1129^{b}4, *Pol*. 1295^{b}33, 1325^{b}36). Since much can happen in Aristotle's world that is not necessitated by anything, but is a matter of luck or chance, or is up to us and what we freely do, such prayers might amount to little more than wishes focused on such things, which are prayerful simply in that they acknowledge the reality of the divine order of things where necessity prevails. Perhaps their intercessory aura is no more than the un-exorcised ghost of Greek popular religion with its pantheon of gods, ever ready to help or harm. In the absence of Aristotle's lost book *On Prayer* (mentioned in F80), it is difficult to be entirely sure.

Precisely (*hoper*): To say that A is *hoper* B is to say that B is precisely what A is (in other words, that A is precisely B). Sometimes B is the kind of A (*Top.* 116^{a}23–28, 122^{b}18–20, *APr*. 49^{b}6–8), sometimes its essence (*Top*. 120^{b}21–26, *Met*. 1007^{a}33).

Predicate (*katêgorein*): Predicating is sometimes restricted to unconditional or non-coincidental cases, where the subject of predication is a substance. To say that the human is walking is thus to predicate walking of a human, while to say that the white thing is walking is not to predicate walking of the white thing, but of the human, who is coincidentally white (*APo*. 83^{a}1–35). Usually, but not always (*Met*. 1049^{a}34–36), what is predicated is a universal. When B is predicated of A, A is said to be B, and B belongs to A. See **Said to Be**

Predication, Figures of (*schêmata tês katêgorias*): The figures of predication are the categories.

Pregnancy (*kuêsis*): *Kuêsis* occurs in a female when she has a *kuêma* in her uterus (or its analog). As a result, it applies in cases in which we would not naturally speak of pregnancy—e.g., when female fishes have unfertilized roe.

Premise, Proposition (*protasis*): A *protasis* is something put forward. When it is put forward in a deduction or argument, it is a premise, otherwise a proposition. When contrasted with a (dialectical) problem, it is a question (*Top*. 101^{b}28–36).

Primary Things (*prôta*): The primary things in the strictest sense are the primary substances (*Met.* 1059^{a}33–34), and of these, the most primary is the one that is simple and an activity (1072^{a}31–32), and so has no matter (or no reference to matter) in its essence (1071^{b}19–21, 1074^{a}35–36). Unlike the essences of matter-form compounds, therefore, which have a structure like that of the compounds themselves (1037^{a}9–10), its essence is not a compound of this form in this matter, both taken universally (1035^{b}29–30). Equivalently, in its essence the activation or form is not predicated or said of anything else, in the way that it is predicated or said of the matter in matter-form compounds (1043^{a}5–6), and so in their similarly structured essences. That is why it is said or expressed "not by way of saying one thing of another" (1030^{a}10–11; also 1051^{b}17–1052^{a}4). It is for this reason too that the primary things are what the most exact science—theoretical wisdom—is concerned with. For as the starting-points of unconditional demonstrations (1015^{b}8–9), they are the primary starting-points and causes (982^{b}1–4)—the "eternal and the primary things" (*GC* 335^{a}29). So "if they were not, nothing would be" (*Met.* 1050^{b}19).

Prime (*akmê*): The prime time for a man's service in the military is that of his body, which is somewhere between the ages of thirty and thirty-five, while the prime time for that of his soul or his capacity for thought is forty-nine or fifty (*Pol.* 1335^{b}34–36, *Rh.* 1390^{b}9–11), and it is not until then that he has the experience required for practical wisdom (*Pol.* 1329^{a}15). A woman is in her (physical) prime between the ages of eighteen and fifty-four or so (1335^{a}28–29, ^{b}26–38).

Prior (*proteron*): The various sorts of priority are distinguished at *Cat.* 14^{a}26–^{b}8. In *Met.* 5.11, Aristotle mentions priority in the sense of being closer to a starting-point, priority in knowledge, in nature and substance. The Greek words for prior, posterior, and simultaneous all have a (secondary) non-temporal, as well as a (primary) temporal sense. The English words "prior" and "posterior" parallel their Greek counterparts in this respect; "simultaneous" does not, but must sometimes (*Cat.* 14^{b}26) be read as if it did. See **Separable**

Private (*idion*): In contrast to what is public or common (*koinon*) (*Pol.* 1263^{a}26, 1266^{a}31, 1273^{a}35, 1279^{a}30, 1284^{b}5, ^{b}23, 1300^{b}22).

Privation (*sterêsis*)

To say what cold is we refer to the positive notion heat, of which cold is the privation, so that cold is what lacks heat: "The positive is prior to the privation" (*Cael.* 286^{a}25–26). That is why "the same account makes clear both the positive thing and its privation, except not in the same way—that is, in a way it is of both, but in a way it is rather of the positive thing" (*Met.* 1046^{b}8–9). Privation may be a matter of degree, so that what is colder lacks more of the hot than what is less cold.

While a privation can be of one of a pair of contraries, it can also be the lack of something—such as substance—that strictly speaking has no contrary (*Cat.* 3^{b}24–27): "One of a pair of contraries is a privation no less [than a contrary], or a privation of

substance, and a privation is the denial [of something] to some definite kind" (*Met*. 1011^{b}18–20). Privation of substance (or form) is evidenced in cases of existence changes, where a substance either comes to be or passes away.

When we affirm that F does not belong to A, we affirm "A is not F," but when we affirm that "A is deprived of or lacks F," or "A is not-F," an underlying subject is involved. This is the "some kind" referred to at, e.g., *Met*. 1004^{a}13. For when A is not-F, it must belong to a kind that can be F or can be not-F. When we affirm "A is deprived of or lacks F," there is thus an underlying kind, G, to which A must belong. Since belonging to G is what makes it possible for A to have F or to be deprived of or lack F, having F or lacking F must both entail being G, so that F must be a difference of G. This is not true when we affirm "A is not F." See *Met*. 5.22, 1055^{b}11–29.

Privative (*sterêtikos*): When applied to a premise or a deduction the adjectives *sterêtikos* and *apophatikos* ("negative") seem to mean more or less the same.

Probative (*deiktikos*): The term *deiktikos* is used to distinguish direct deductions from indirect ones, which lead to the impossible (*APr.* 45^{b}9) and also to distinguish demonstrations that do not involve a privation from those that are *sterêtikos* because they do (*APo*. 86^{a}32, ^{b}31, 36, 87^{a}5).

Problem (*problêma*): "A dialectical problem is a speculation, directed either to choice and avoidance or to truth and knowledge (either by itself or when working together with something else of this sort), about which people believe nothing either way, or ordinary people believe in a contrary way to the wise, or the wise to ordinary people, or each of them to themselves" (*Top*. 104^{b}1–5). The term is also used in a similar way outside dialectic (*Ph*. 213^{b}3, *GA* 724^{a}7, 746^{b}16, *Pol*. 1268^{b}26, 1284^{b}3, *EE* 1244^{a}3, *Rh*. 1414^{a}35, *Po*. 1460^{b}6). In the *APr*. problems are the four forms of premise or conclusion: universal affirmative and negative, particular affirmative and negative.

Produce, Production (*poiein*, *poiêsis*): (1) In the broadest sense *poiein* is a matter of doing something to something, acting on it or affecting it in some way, so that the latter *paschein* ("suffers," "undergoes," or "is affected") correlatively. (2) In a narrower sense production is contrasted with action, as not being intrinsically an end, but something chosen or desired for the sake of some further end (*NE* 1139^{b}1–4). See **Craft**

Progression (*poreia*): The sort of movement characteristic of animals. The corresponding adjective *poreutikos* is "walker" or "move by walking," when it applies to walkers in contrast to flyers or swimmers, and as "progress" or "move by progression" otherwise.

Prohairesis: **Deliberate Choice**

Proof (*tekmêrion*): "A necessary sign is a proof. . . . I call 'necessary' those from which a deduction comes about. That is why indeed such a sign is a proof; for when people think that it is not possible to refute what has been stated, they think they are putting forward a proof, on the supposition that the matter has been proved and come to an end" (*Rh*. 1357^{b}5–9).

Proper (*oikeios*): *Oikeios* derives from *oikos* ("household"), so that what is *oikeios* to something belongs to it or is proper to it.

Property Assessment (*timêma*): A measure of wealth or property for the purposes of taxation or determining public service, often used to determine citizenship or eligibility for political office.

Pros ti: **Relative**

Prosêkon: **Fitting**

Prostatês: **Champion, Sponsor**

Prôta: **Primary Things**

Protasis: **Premise**

Proteron: **Prior**

Prove (*deiknunai*): To prove something is sometimes to demonstrate it (*APo*. 71^{b}23, 72^{a}39), but proving a starting-point is not demonstrating it. The nominalized form of the verb is "proof" (*APo*. 84^{b}34, 88^{b}2). See **Dialectic**

Proxenos: **Agent**

Psêphisma: **Decree**

Psophos: **Sound**

Psuchê: **Soul**

Psuxis: **Cold**

Ptêtikos: **Flyer**

Public Service (*leitourgia*): Any public service paid for out of private funds, such as funding a chorus for a play, equipping a trireme for the navy, or providing a feast for the city (*NE* 1122^{b}22–23). Sometimes, *leitourgein* comes close in meaning to our notion of charitable giving (1163^{a}29, 1167^{b}12).

Puetia: **Rennet**

Pungent: *Drimus*

Puon: **Pus**

Purgation (*katharsis*)
When something is purged of impurities, it is rendered pure (*katharos*). In biological contexts the term seems to be used exclusively (though *GA* 747^{a}19 may be an exception) in connection with menstruation (*HA* 573^{a}2, ^{b}29, 573^{a}8, 23, *GA* 727^{a}14, ^{b}20), which purges a female (or her menses) of impurities. It is especially, but not exclusively, important in Aristotle's account of tragedy, which is said to accomplish "through pity

and fear the purgation of such feelings" (*Po*. 1449^{b}27–28). A perspicuous account of it is advertised at *Pol*. 1341^{b}38–40, but is not found in the extant works. Nonetheless, the outlines of an intelligible account can be reconstructed with at least moderate confidence, on the basis of 1342^{a}1–16.

Those who are prone to pity or fear or to feelings generally "all get, together with pleasure, a certain purgation and feel their burdens lightened" (*Pol*. 1342^{a}14–15) by listening to "sacred melodies (when they make use of the ones that induce a frenzy in their souls)" (1342^{a}9–10). For the movements in purging music produce correlative movements in the appropriate sort of animate body, which can, when the movements are excellent, produce through repetition and habituation a corresponding virtuous—and so mean—state in the soul (1340^{a}12–28). If we think of the souls of listeners as initially "distorted from the state that is in accord with nature" (1342^{a}22–23), as those of people who are prone to pity and fear are bound to be, we can think of the—perhaps temporary—purgation they experience as stemming from the purging, or correction, of those distortions (*NE* 1109^{b}6–7).

Tragedy, since it involves rhythm, harmony, and melody (*Po*. 1449^{b}29–31), can surely have these very same sorts of effects. But though the whole complex imitation that is the tragedy itself, comprising all its various elements, is "the imitation of a serious and complete action that has magnitude" (1449^{b}24–25), it is the plot that primarily imitates that action and that primarily arouses pity and fear (1450^{b}18–19, 1453^{b}1–7). It seems, then, that it must also be primarily the plot that effects the purgation of these feelings. So the account of music's purging power does not directly carry over to tragedy.

But just as certain movements in the appropriate sort of animate body are correlated with, or realize, certain feelings, so words that evoke those feelings in us are correlated with those same movements, just as images are (*Pol*. 1340^{a}25–28). By operating in the right way, then, and imitating or representing a good person moving from good luck to bad luck, not because of his character but because of "some sort of error" (*Po*. 1453^{a}10), it can (even if only temporarily) purge the distortions, restoring the movements associated with pity and fear to their natural or mean condition (or one closer to it), thereby purging the associated feelings. But this sort of purgation, this rectification of distortions, also has significant cognitive effects. For feelings that are in a mean (or closer to a mean), unlike those that are not, are better discerners of the things—such as danger—that evoke the feelings. That is why, when we have courage, we measure the danger of something correctly, seeing it for what it is, and feeling the correspondingly correct amount of fear toward it, "for the courageous person feels and acts as things merit and in the way reason prescribes" (*NE* 1115^{b}19–20). The same is true mutatis mutandis of pity, where sympathetic consideration rather than courage is involved (1111^{a}1–2). (On the purgation of feelings in comedy, see F111.)

Pus (*puon*): "Blood that putrefies in the body" (*HA* 521^{a}20).

Putrefaction (*sêpsis*): (1) "Putrefaction is the passing away of the proper and natural heat within a given wet thing caused by an alien heat, that is, the heat from its environment"

(*Mete*. 379^{a}16–18). (2) "Putrefaction, that is, the putrefied thing, is a residue of concoction" (*GA* 762^{a}14–15). (3) "Putrescence (*saprotês*) is the end of all these things, that is, of the ones composed by nature, unless something passes away by force; for it is indeed possible to burn flesh, bone, and whatever, but the end of their passing away in accord with nature is putrefaction" (*Mete*. 379^{a}5–8).

Puzzle (*aporia*): (1) A dialectical puzzle about "whether it is so or not so" arises "because there are persuasive arguments on both sides" (*Top*. 104^{b}13–14). (2) A puzzle more generally may simply be a question which as yet has no answer (*HA* 616^{a}30–32). See **Dialectic**

Quadrature by Means of Lunes or Segments: The argument of the mathematician Hippocrates of Chios (fl. c. 450–430 BC) for squaring the circle by means of segments (*Ph*. 185^{a}16) or lunes (*SE* 171^{b}15), which are the figures bounded by two arcs of a circle, is a geometrical fallacy (*SE* 172^{a}3–7).

Quality (*poion*): Defined in *Cat*. 8, *Met*. 5.14. See **Sort of Thing**

Quantity (*poson*): Defined in *Cat*. 6, *Met*. 5.13.

Rare (*manos*): See **Condensation and Rarefaction**

Ratio: See *Logos*

Rational Calculation (*logismos*): See **Deliberation**

Reason: See *Logos*

Reason, Correct (*orthos logos*): The importance of correct reason in ethics is introduced at *NE* 1103^{b}31–34 as something agreed to, and much used subsequently (1114^{b}29, 1119^{a}20, 1138^{a}10). *NE* 6.1 recognizes the need to provide a perspicuous account of it (1138^{b}26) that will determine what it and its defining mark are (1138^{b}34), but though much is said relevant to this in *NE* 6, no such account is explicitly provided. However, *EE* 1249^{a}23–^{b}27 does provide one.

Reasonable (*eulogos*): If X is *eulogos* it is favored by evidence or considerations of various sorts (*DA* 429^{a}25, *GA* 763^{a}4, *Met*. 1074^{a}16, *NE* 1097^{a}8), such as things that appear to be so, things that are said, or acceptable beliefs, so that it is *eikos* ("it makes perfect sense") that X should hold (*NE* 1099^{b}32, 1122^{a}13). But X is typically not something scientifically known or demonstrable, and it may turn out, when more evidence is available, to be false (*Cael*. 2.12, *Met*. 1073^{b}13–17).

Recipient, Primary (*prôton dektikon*): The recipient of, e.g., pale is what the affection paleness belongs to (*Ph*. 186^{a}29), or what "pale" is predicated of. Since "something's being pale will be a composition of surface and paleness" (*Met*. 1045^{b}15–16), surface

figures in the definition of its essence, and so is the primary recipient of paleness. Surfaces, in turn, are the surfaces of substances, so that Socrates is also a recipient of paleness if his surface is a primary recipient of it. Generally, when A is receptive of B, A can take on B.

Reciprocal Replacement (*antiperistasis*): "When . . . the fire is expelled [from a body], . . . propulsion is exerted upon the surrounding air, which in turn compresses the still mobile liquid volume into the places previously occupied by the fire and mixes with it itself" (Plato, *Timaeus* 59a). Aristotle makes use of the notion at *APo*. 98^{a}25–29, *Ph*. 215^{a}15, 267^{a}18, *Mete*. 348^{b}2, 361^{a}1, *Somn*. 457^{b}2, 458^{a}27.

Refutation (*elegchos*): (1) "A refutation is the deduction of a contradiction" (*APr*. 66^{b}11). (2) "A refutation is a deduction together with the contradiction of the conclusion" (*SE* 165^{a}2–3).

Refute, Resolve (*luein*): To *luein* an argument is to untie or resolve (also, *luein*) the knot or puzzle (*aporia*) that it produces when it conflicts with another argument or consideration (*Met*. 995^{a}29). Sometimes it is equivalent in meaning to *elegchein* (also "refute"): "It is possible to refute (*luein*) [an enthymeme] either by stating a counter deduction or by bringing an objection" (*Rh*. 1402^{a}31). But sometimes it differs from it by involving a diagnosis of what is wrong with the target argument: "The person, then, who does away with what the falsehood depends on has entirely resolved the argument, and it is the person who knows that the argument depends on it who knows the resolution" (*Top*. 160^{b}33–35).

Relative (*pros ti*): Neither a relative term, designating a relation, nor a person or thing that a relative term applies to, but rather a person or thing as designated by some relative term. See *Cat*. 6^{a}36–^{b}2, 8^{a}3–34, *Ph*. 200^{b}28–32, *Met*. 1020^{b}26–32, 1056^{b}34–1057^{a}1.

Rennet (*puetia*): "Milk that contains the fire that comes from the heat of the animal when the milk is being concocted [in the stomach]" (*HA* 522^{b}6–8).

Residue (*perittôma*): "A leftover of the nourishment" (*GA* 724^{b}26–27).

Resilience (*karteria*): Resilience is a mean state between luxuriousness and toughness (*EE* 1221^{a}9). It goes along with being hard (*sklêros*) and so is the contrary of being soft (1229^{b}2). At *Cael*. 287^{b}33–34 human conviction is contrasted with a more resilient sort.

Resolution (*lusis*): See **Refute**

Reversal (*peripeteia*): Defined at *Po*. 1452^{a}22–24.

Rhetoric (*rhêtorikê*): A *rhêtôr* is someone who knows the relevant craft, knows how to use it, and puts it to use. Insofar as he does so by writing speeches to be read, or for others to deliver, he is a "rhetorician," or, in the standard translation, an "orator." But the one who actually delivers the speech, considered as such, is a "speaker." To a first

approximation, therefore, rhetoric is the craft in question and a speech the product. More precisely, rhetoric is the counterpart of dialectic (*Rh*. 1354^{a}1), the methodical inquiry concerned with the means of persuasion (1355^{a}4). See **Persuasion, Means of**

Rheum (*lêmê*): Rheum is putrefied tears (*Mete*. 379^{b}31–32), so a healthy eye does not produce rheum (*HA* 633^{b}20–21) and *lêmê* is an "eyesore" (*Rh*. 1411^{a}15).

Rhopê: **Weight, Balance-**

Rolling (*kulisis*), **Rotation** (*dinêsis*): Rotation occurs when a sphere turns around its own axis in the same place, rolling when it at the same time changes place.

Roughness and Smoothness (*trachutês kai leiotês*): Something is smooth "because its parts lie somehow along a straight line, and rough because some parts stick out and others recede" (*Cat*. 10^{a}22–24).

Rule (*archê*): The notion of exercising rule (*archein*) and the correlative notions of being a ruler (*archôn*) or holding ruling office (*archê*) is explained in the following brief passage: "That in accord with whose deliberate choice what is moved is moved and what is changed is changed—for example, the rulers in cities, dynasties, and kingships are said to be *archai*, as are crafts, especially architectonic ones" (*Met*. 1013^{a}10–14).

Said to Be (*legetai*): (1) When A is said to be B (or B is predicated of A, or B belongs to A), A and B are typically not linguistic items, but particular things or universals, so B is not set in quotation marks. (2) When A is said to be B and the grounds on which it is said to be B differ, Aristotle says that A is said to be B "in many ways (*pollachôs*)." These include the following: there is a respect in which A and B are similar (*APo*. 99^{a}11–12); A is said to be B by analogy; and A is said to be B "with reference to one thing (*pros hen*) and one nature—that is, not homonymously" (*Met*. 1003^{a}33–34). (3) When A is said to be B with reference to one thing, there is no single thing X present in both A and B that is is the ontological correlate of B, as there is when A is said to be B by analogy. But there is something else C, to which A and B are related in robustly specifiable ways, and X is present in C. As with A's being B by analogy, X then provides grounds for the scientific knowledge that A is B (*Met*. 1003^{b}11–16). See **Analogy**

Same: See **One**

Saphês: **Perspicuous**

Satyr Play (*saturikê poiêsis*): A mythological burlesque with a chorus of drunken and lascivious followers of Dionysus, performed after a trilogy of tragedies at a dramatic festival.

Say, Things We (*legomena*): The things we say (*legein*) about something, or that seem true of it (*phainomena*), or that are thought or believed about it (*doxa*) are starting-points for a philosophical investigation of it. They need not all turn out to be among the

endoxa or acceptable beliefs that must be left intact, once the puzzles to which they give rise have been gone through.

Saying: *Logos*

Schadôn: **Grub**

Schêma: **Figure**

Scholê: **Leisure**

Science, Productive (*poiêtikê*): See **Craft**

Science, Scientific Knowledge (*epistêmê*)
Knowledge of a science is a state of the soul that enables its possessor to give demonstrative explanations—where a demonstration (*apodeixis*) is a special sort of deduction from scientific starting-points, which are of just three sorts (*APo*. 76^{a}37–^{b}22). Those special to a science are definitions of the real (as opposed to nominal) essences of the beings with which the science deals (90^{b}24, 93^{b}29–94^{a}19). Because these are definitions by kind and difference (96^{a}20–97^{b}39), a single science must deal with a single kind (75^{b}10–11, 84^{b}17–18, 87^{a}38–39). Other starting-points (so-called axioms) are common to all or many sciences (72^{a}14–24, 88^{a}36–^{b}3). A third sort of starting-point posits the existence of the kind with which the science deals, but this may often be left implicit if the existence of the kind is clear (76^{b}17–18). The source of these starting-points, in turn, is perception and experience, which lead by induction, to a grasp of them by understanding (100^{a}3–9).

To constitute a demonstration a deduction must be a valid syllogism in the mood Barbara, whose premises meet a number of conditions. First, they must be immediate or indemonstrable, and so must be reached through induction. Second, our confidence in them must be unsurpassed (*APo*. 72^{a}37–^{b}4). Finally, they must be necessary (and so, of course, true) in a special sense: the predicates in them must belong to the subjects in every case, intrinsically, and universally (73^{a}24–27).

In every case: A predicate A belongs to every subject B if and only if there is no B to which it fails to belong and no time at which it fails to belong to a B: "for example, if animal holds of every human, then if it is true to say that this is human, it is true to say that this is animal too, and if it is now true to say the one, it is now true to say the other as well" (73^{a}29–31).

Intrinsically: A predicate A belongs intrinsically to a subject B just in case it is related to B in one of four ways: A is in the account or definition of what B is, or of B's substance, or essence (73^{a}34–37); B is a complex subject φB_1, where φ is an intrinsic coincident of B_1—e.g., odd number or male or female animal—and A is in the definition of φB_1's essence; A just is B's essence; A is not a part of B's essence or identical to it but stems causally from it, so that being B is an intrinsic cause of being A (73^{a}34–^{b}24).

Universally: A predicate A belongs to a subject B universally just in case "it belongs to it in every case and intrinsically, that is, insofar as the thing is itself" (73^{b}26–27).

Because intrinsic predicates stem in various ways from essences, the subjects to which they belong must have essences. In other words, they must be intrinsic beings, since—stemming as they do from essences—intrinsic predicates identify or make them clear: "The things said to *be* intrinsically are the very ones signified by the figures of predication" (*Met*. 1017^{a}22–23). These figures of predication are the so-called categories (*Top*. 103^{b}7–25). For each of the intrinsic beings in these ten categories we can state its what-it-is (*Met*. 1030^{a}17–24), even if strictly speaking only substances have definitions and essences (1031^{a}7–24). Specifying these beings is one of the tasks of the *Categories*, where Aristotle explains how beings in categories other than that of substance are ontologically dependent on those in the category of substance.

What all four types of intrinsic beings have in common, what makes them worth the attention of someone inquiring into ultimate starting-points and causes, is that they are the ontological correlates or truth-makers for scientific theorems—the beings responsible for the necessary truth of those theorems. Moreover, they would seem to be the only sorts of being that can play this role, since they constitute an exhaustive catalog of the necessary relations that can hold between a subject A and something B predicated of it: B is part of the essence of A; A is part of the essence of B; B is the essence of A; the essence of A (being A) is an intrinsic cause of (being) B.

All sciences of this sort are either theoretical, practical, or productive (*Met*. 1064^{a}16–18). The three kinds of theoretical sciences are the natural, the mathematical, and the theological (1064^{b}2–3). Politics, which comprises ethics (*NE* 1094^{b}11), is a practical science—one concerned with action (1103^{b}26–31). Rhetoric and poetics, together with all the crafts, are productive sciences.

Epistêmê is "science" or "scientific knowledge," and the cognate verb *epistasthai* "have scientific knowledge of" (or an equivalent), even when they may have a looser and less technical meaning (*Pol*. 1255^{b}30, 1271^{b}5, 1277^{a}25). See **Deduction**

Sciences, Free: "Just as a human being is free, we say, when he is for his own sake and not for someone else, in the same way we say that [theoretical wisdom] is the only free science; for it alone is for its own sake" (*Met*. 982^{b}25–28). At *Pol*. 1337^{b}15, the free sciences are those that are fitting for a free person to learn.

Scientifically Known, Knowable (*epistêton*): As in the case of *aisthêton*, *prakton*, and *chôriston*, and verbals ending in *-ton*, *epistêton* sometimes has the meaning of a perfect passive participle and sometimes expresses possibility.

Sea Snail: *Kochlos*

Secretion (*apokrisis*): The noun *apokrisis* is used to refer exclusively to spermatic (*GA* 727^{a}27) or generative (739^{a}5) residues, or to related things, such as milk (776^{a}27, 776^{b}29, 777^{a}4) and the cognate verb *apokrinein* to their expulsion. Another noun, *ekkrisis* (verb: *ekkrinein*) is used a few times to refer to the expulsion of spermatic residues (751^{a}22, 765^{b}29, 774^{a}5, 775^{b}7) and milk (776^{b}20), but is also used for the expulsion

of waste products (719^{b}32, 720^{a}7, 750^{a}30, ^{b}21) and for the outgrowth of bones, horns, and teeth (728^{b}21).

Seed (*sperma, katamênia*): "A residue that comes to be by a change in the nourishment" (*GA* 736^{b}26–27). This is true both of male—and occasionally female (*PA* 689^{a}12)—semen (*gonê*), and of female menses (*katamênia*), or, more exactly, of the useful residue in each.

Seed, a (*gonos*): *Gonos* refers to fish eggs or spawn (*HA* 543^{a}6), to what becomes the larva of a bee (554^{a}21–23), to fully developed offspring, and to a brood of birds or bees (553^{b}21). Context determines its translation, with "seed" and "offspring" usually preferred.

Selachê: **Selachian**

Selachian (*selachê*): A sort of animal that is "footless, has gills, and is live-bearing" (*HA* 511^{a}5–6). Cartilaginous fish, including sharks.

Self-control, Lack of (*akrasia*): Discussed briefly in *NE* 1.13 and more fully in 7.1–10.

Self-deprecator (*eirôn*): (1) Socrates is the canonical *eirôn*, whose disavowal of expert craft knowledge of virtue is a commonplace in Plato's portrait of him (*Apology* 20d–e, 21b, *Meno* 71b, *Protagoras* 361c, *Republic* 354c). As a result many of his interlocutors—especially hostile ones—charge him with *eirôneia* ("irony" as it is usually translated in this context), thinking that he must have such knowledge if he is able to refute others (*Republic* 337a, *Symposium* 216e). Aristotle, however, takes these disavowals at face value (*SE* 183^{b}7–8, *NE* 1127^{b}25), so that "self-deprecation" is generally a less misleading translation. (2) At, e.g., *Pol.* 1275^{b}27 the associated verb *eirôneuomai* means "in jest."

Self-love (*philautia*): Focally discussed in *NE* 9.8.

Self-sufficient (*autarkês*): Something is *autarkês* if (1) it has no needs, or none that it cannot satisfy itself (*Cael.* 279^{a}21, *Met.* 1091^{b}15–20, *NE* 1112^{b}1, 1125^{a}12, 1160^{b}4, 1169^{b}5), or (2) if it satisfies all of a relevant set of needs of something else: happiness is *autarkês* because, on its own, it "makes a life choiceworthy and lacking in nothing" (*NE* 1097^{b}14–15, 1176^{b}5).

Sêmainein: **Signify**

Sêmeion: **Sign**

Semen (*gonê*): See **Seed**

Seminal Fluid (*thoros*): Milt in male fishes and its equivalent in other animals (*HA* 510^{a}1).

Semnotês: **Dignity**

Separable, Separated (*chôriston*)
As in the case of *aisthêton*, *epistêton*, *prakton*, and verbals ending in *-ton* generally, *chôriston* sometimes has the meaning of a perfect passive participle ("separated") and sometimes express possibility ("separable"). When *chôriston* is applied to substances it is translated as "separable," since this often seems to capture its sense better, especially that of its negative. But just what the separability of substances amounts to is another—and controversial—issue.

(1) Walking and being healthy are characterized as not "capable of being separated," on the grounds that there is some particular substantial underlying subject of which they are predicated (*Met*. 1028^{a}20–31). Often, separability is associated with being such a subject: "If one does not posit substances to be separate, and in the way in which particular things are said to be separate, one will do away with the sort of substance we wish to maintain" (1086^{b}16–19; also 1019^{a}5–6). Similarly, not being separable is associated (*Ph*. 185^{a}31–32) with being predicated of such a subject. Being predicated of a substance—being an affection—seems, then, to be a sufficient condition of not being separable. Moreover, not being separable seems itself to be a sufficient condition of being ontologically dependent (*Cat*. 2^{b}3–6).

(2) Couched in terms of priority, what is attributed to primary substances in (1) is substantial priority, or priority in nature, which Aristotle defines in two ways: (2a) Things are said to be prior "in nature and substance, when it is possible for them to be without other things, but not the others without them" (*Met*. 1019^{a}3–4); (2b) "Those things are prior in substance to others which, when separated, surpass them in being" (1077^{b}2–3). Moreover, in a text apparently expressing an idea similar to (2b), the form of a matter-form compound is said to be "prior to the matter and more of a being" (1029^{a}5–6). Since existence, like identity, does not come in degrees, the use of "surpass" and "more" makes it difficult to understand "being" as having an exclusively existential sense. At the same time, "being" does seem to have some existential import, as it surely does in (2c): "if everyone were healthy, health would exist, but illness would not. Similarly, if everything were white, whiteness would exist, but blackness would not" (*Cat*. 14^{a}7–10). It seems reasonable, therefore, to think that to be is to be a being of some sort, and that to be a being entails existing.

To be a being, however, is to be either a coincidental being (the pale human) or an intrinsic being, something with an essence (the human). To be an intrinsic being, in turn, is to be either an intrinsic coincident, a matter-form compound, or simply a substantial form. As identical to its tightly unified essence (*Met*. 1037^{b}10–27), a substantial form is an intrinsic being of the highest order—a primary substance (1037^{b}3–4). A matter-form compound, by contrast, since it is never identical to its essence (1037^{b}4–7), is an intrinsic being of a lower order (1072^{a}30–32), since it is always a complex thing—a this in this (1030^{b}18)—whose essence is complex in a structurally parallel way (1035^{b}27–30). Similarly, an intrinsically coincidental being, while it follows from

an essence, is still a complex of two intrinsic beings, one a substance with an essence, the other an affection. For X to be more of a being than Y, or to exceed Y in being, we might reasonably conclude, is for it to be closer to a substantial form on this scale. It is, as we might put it, for X to be more intrinsic a being than Y. Degrees of being are degrees of being intrinsic, then, not degrees of existence.

(3) Affections depend for their existence on substance, but not on that of some particular substance: any substance that has them will do. White exists if something is white, but the something does not have to be Bucephalus or Socrates. Hence the parallel claim about substances should not be that a substance can exist without any affections, suggesting that substances are bare particulars, but that substances in general can exist whether or not affections do. Now, on an *ante rem* (or Platonist) theory, affections can exist un-instantiated by (perceptible) particulars, whereas *in re* theory, like Aristotle's, they cannot. That is the message of (2c). Hence the ontological dependence of affections—and the cognate ontological independence of substances—must be formulated differently by these theories. It seems, then, that if *in re* affections were ontologically independent of substances, it could only be because they were instantiated by something else, since they cannot exist un-instantiated by particulars of some sort. This is the way we see Aristotle thinking in the following text: "it is possible for the hot or the straight to be present in every thing, but it is impossible for the whole thing to be either hot or straight or white; for then the affections would be separate" (*Long*. 465^{b}12–14). Whiteness would be separate from substance, notice, not if it existed entirely un-instantiated, but if it were instantiated by a being that was wholly and exclusively white. Such a being is obviously not an Aristotelian substance, but something more like the Platonic Form of whiteness, which does seem to be white and nothing else (Plato, *Phaedo* 78d). Aristotelian substances can exist, then, whether or not their affections exist by being instantiated by something else. Affections, on the other hand, cannot exist unless they are instantiated by Aristotelian substances, since such substances are (in Aristotle's view) the only ultimate subjects of predication. The separability of substance from affections, on this way of looking at it, is entirely of a piece with their inseparability from it.

(4) The verb *chôrizein* derives from *chôra* ("place"), and means "to separate, part, sever, or divide" things by causing them (roughly speaking) to be in disjoint places (*Met*. 998^{a}17–19, 1068^{b}26–27): when Aristotle describes Plato as separating the Forms from perceptible particulars (1078^{b}30–32), the primary connotation is that of putting them in separate places: perceptible particulars are "here," Forms are "over there" (990^{b}34–991^{a}1). For a Form is "a particular, they say, and separable" (1040^{a}8–9) and "place is special to particular things, which is why they are separable by place" (1092^{a}18–19). Moreover, the fundamental objection Aristotle makes to such separable Forms is that they are an incoherent mixture of universals and of the particulars needed for their instantiation and existence: "They at the same time make the Forms universal and contrariwise treat them as separable and as particulars. But that this is not possible is a puzzle that was gone through before" (1086^{a}32–35; 1003^{a}5–17). We might expect,

therefore, as (4) implies, that the separability Aristotle accords to his own substances, but denies to affections, is the same as the separability he denies to Platonic Forms: affections are in substances around here, not in substances (= Forms) that are elsewhere.

(5) Though separability is often characterized in terms of existential independence, in some cases this seems not to be required (*Cat*. 14^{b}11–22). What lies at the bottom of separability, then, seems rather to be a sort of ontological independence that is causal or explanatory in nature. And this is clearly what we find in the following texts: "[vegetative soul] can be separated from the others, but in the case of mortal beings the others cannot be separated from it" (*DA* 413^{a}31–32); "these bodily parts . . . cannot even exist when they are separated" (*Met*. 1035^{b}22–24). For what makes perceptual soul inseparable from nutritive soul, or a finger inseparable from an animal, are the causal relations that make the former dependent on the latter. Again, this makes the separability accorded to substances, but denied to affections, the same as the separability denied to Platonic Forms. For the latter too were intended to play an explanatory role: "the Forms are the causes of the what-it-is of other things, as the one is of the Forms" (988^{a}10–11). "What all the gods love" does not pick out the Form of piety, then, because being loved by the gods is not what makes something pious (Plato, *Euthyphro* 10d–e).

(6) The separability of substance and the inseparability of affections, while obviously essential to the account of both, is a special case of a more general phenomenon. For substance as form is not just separable from affections but from matter as well. But if this is the sort of separability characterized in (1)–(5), it must be asymmetrical, so that form can exist apart from matter but not matter apart from form. In the case of the forms of matter-form compounds, whether their matter is perceptible or intelligible, this is clearly not the case: like snub, but unlike concavity, they cannot exist apart from matter (*Met.* 1025^{b}28–1026^{a}15). But in the case of other forms, those that are like concavity, it is possible (1026^{a}15–16, 1071^{b}20–21). These are the primary intelligible substances, on which all others—including matter-form compounds—causally depend for their existence (1050^{b}19) and order (1060^{a}26–27). Matter, by contrast, cannot exist apart from form of some sort (1089^{b}27–28), since without form it is not intrinsically anything at all (1029^{a}20–21).

(7) In (1) separability is tied to being a particular subject of predication, and so seems to be somehow logical or logico-linguistic in nature. (6), on the other hand, seems to tell a different sort of story, in which separability has more to do with causation and explanation than with logic pure and simple. To bring the two together we need only reflect that Aristotle's logic is primarily a logic of science, and that whenever we have a subject-predicate proposition there is always a question as to why the predicate holds of the subject. The target of scientific explanation, indeed, is always precisely this: Why does predicate P hold of subject S (*Met.* 1041^{a}10–11)? If P holds of S coincidentally, or by luck or chance, science has nothing to say about it (1026^{b}3–5): there is no explanation. But if P is an intrinsic coincident of S, or if P is part of S's essence, or is S's essence, science does have something to say about it. What this implies is that the primary explanatory entities cannot themselves have a subject-predicate structure

(*Met*. 1051^{a}34–^{b}5). They cannot be expressed as one thing said of another—they are not thises-in-thises. Instead, in comparison to things with such a structure, they are simple: forms, not matter-form compounds. The problem is how separable forms, which, like all forms, are universals (1036^{a}28–29), can indeed be primary subjects and this somethings—separable "in the way in which particular things are said to be separate" (1086^{b}17–18). Aristotle's answer is given at 1087^{a}10–25.

Sêpsis: **Putrefaction**

Serum (*ichôr*): "Unconcocted blood; either blood that is not yet concocted or that has become serous" (*HA* 521^{b}2–3; also *PA* 651^{a}17–19). The other part consists of fibers (*ines*), which are "intermediate between sinew and blood vessel" (*HA* 515^{b}27) and are "earth" (*PA* 651^{a}7). See also *Mete*. 384^{a}25–33.

Setting-out (*ekthesis*): (1) The verb *ektithenai* means "expose," "exhibit," or "set-out." In Aristotle's logic *ekthesis* is a way of confirming the truth of a third figure syllogism (P belongs to every S, R belongs to every S, P belongs to some R) by exhibiting or setting-out a particular S (call it N). For N will be R and N will be P (*APr*. 28^{a}10–30). The original home of *ekthesis*, though, is in a geometrical proof, where it refers to the stage at which an arbitrary instance is drawn for the student to see and assigned a name: let ABC be a triangle in which the side AB = the side AC (*APr.* 49^{b}33–50^{a}4). (2) The Platonic method, embodied in *the one over many* argument, of introducing a single Form for each many (*Met*. 1031^{b}21, 1086^{b}10, 1090^{a}17).

Sex Organ (*aidoion*): An *aidoion* can be a penis (*HA* 493^{a}25), a vagina (493^{b}2), or a uterus (*GA* 764^{b}23), and may also be employed for the excretion of residues (719^{b}30–31).

Shameful (*aischron*): See **Noble**

Shape (*morphê*): See **Form**

Sharp and Dull (*oxu kai baru*): "It is the rapid sound that is sharp (as those who do arithmetical harmonics say)" (*Top*. 107^{a}15–16). The sound is rapid because it is produced by rapid vibrations of a tight string, producing a high, sharp, piercing sound. Slower vibrations of a slacker string produce flat, bass, or dull sounds. *To oxu* in the case of sound is high-pitched, and *to baru*, low-pitched, flat, or bass. To better preserve the analogy with touch *baru* is often "dull."

Sheatfish (*glanis*): The catfish family.

Seeing, Sight (*horasis, opsis*): The movement of the eye-jelly "insofar as it is transparent, but not insofar as it is liquid" (*GA* 780^{a}3–4). *Opsis* is generally the perceptual modality of sight, focally discussed in *DA* 2.7 and *Sens*. 2–3, but sometimes seems to be a ray of sight (*GA* 781^{a}3–12).

Sign (*sêmeion*): (1) Aristotle often declares something to be a sign of something. Signs, however, are of two sorts: related as (a) particular to universal or (b) as universal to

particular (*Rh*. 1357^{b}1–2). An example of (a): "if someone were to say that, since Socrates is wise and just, it is a sign that the wise are just" (1357^{b}11–13); an example of (b): "if someone were to say that there is a sign that a person is feverish, for he is breathing rapidly" (1357^{b}18–19). Both of these are refutable (1357^{b}13, 19–20). Yet "truth . . . may exist in all signs" (*APr*. 70^{a}37–38). This truth cannot be necessary truth: signs are not proofs or demonstrations. It must, then, be either contingent truth or the sort of non-continuous or gappy necessary truth found in things that hold for the most part (*APr*. 32^{b}6). But only a universally quantified proposition can hold for the most part, as in the examples Aristotle gives about crabs (*HA* 527^{b}6–7). With signs, by contrast, there are some that are related as particular to universal, as the fact that Socrates is wise and just is a sign that the wise are just. So a sign can be a particular proposition; one that holds for the most part cannot. At the same time, though, it is not just a contingent fact that Socrates is both wise and just, as it might be that he was married to Xanthippe, but something (putatively) more robust than that: a non-continuous or gappy necessity. (2) A *sêmeion* can also be a point (*APo*. 76^{b}5, *Top*. 141^{b}12, *Ph*. 240^{b}3) or a token (*PA* 669^{b}29).

Signify (*sêmainein*): Aristotle uses the verb *sêmainein* and the cognate noun *sêmeion* to express (1) a relation between a linguistic element, such as a noun or name, and the thing it signifies, means, or denotes, but also (2) a relation between two nonlinguistic elements. In general, when A signifies B, A is not enclosed in quotation marks.

Simple: See **Unconditionally**

Skôptein: **Jibe**

Slave (*doulos*)
A slave is an animate piece of property belonging wholly to his master (*Pol*. 1254^{a}12–23)—an instrument or tool for use in matters having to do not with production but with action (1254^{a}7–8). Some people are legal slaves, or slaves simply because they have been enslaved. Others, however, because their souls lack a deliberative part (1260^{a}12), are natural slaves. As a result, they are not self-sufficient (1291^{a}10) and cannot be happy (1280^{a}32–34). For such people slavery is coincidentally advantageous and just (1255^{a}1–3, 1278^{b}32–37). But it is neither just nor advantageous for merely legal slaves to be enslaved, unless perhaps if they have been living as slaves for some time.

There are also various sorts of natural slaves, some of whom seem to have a larger share in virtue (or reason) than others (*Pol*. 1255^{b}27–29, 1260^{a}14–20, 1330^{a}30–31). Similarly, there are also various sorts of free people: an unrefined craftsman is a free man whose soul presumably has a deliberative part, yet he has "a sort of limited slavery" (1260^{a}41–^{b}1), but he is not a free citizen in most constitutions (3.5).

It is presumably in these doctrines, if anywhere, that we should look for an easing of the tensions that exist in Aristotle's account of natural slaves, three of which are particularly evident. First, though it is just and advantageous for natural slaves to be enslaved, all slaves, natural or legal (it seems), should be offered freedom as a reward for

good service (*Pol*. 1330^{a}32–33). Second, though slaves lack a deliberative part, those heads of household who have the resources delegate the position of household manager (a position that seems to require both deliberative ability and foresight) to a steward, who is himself (presumably) a slave (1255^{b}35–37). Third, and related to the second, is the fact that insofar as a slave is a human being, there is even possibly a sort of friendship between master and slave (1255^{b}12–15).

Perhaps the thought underlying these claims is that training can, as in the case of non-human animals, make up for much of what nature fails to provide. For though these animals too lack a deliberative part, they are capable, because they have imagination, of making associative connections between experiences, which can guide their behavior in much the way that explicit deliberative reasons can guide mature human action. A natural slave with an adequately stocked imagination, then, might well, even without autonomous access to deliberative reasons, make an excellent steward, a passable friend, and be ready, at a certain point, to be released from slavery. Moreover, unlike wild animals, but like children, slaves do have reason, in the sense that, like the desiring part of the soul (*NE* 1102^{b}30–1103^{a}3), they can listen to reasons generated by others, and both understand and follow them.

Sleep (*hupnos*): "Sleep is not every incapacity of the perceptual part, but this affection comes about from the exhalation that rises in connection with nourishment. For the product of the exhalation is necessarily pushed up to a certain point, and then it must turn and change its course like the tide in a narrow strait. And the hot material of each of the animals is naturally carried upward. But when it reaches the upper places, it turns back in a mass and is carried downward. . . . When, then, it comes to a stop, it weighs one down and makes one doze off. And when it turns, sinks downward, and pushes away the hot material, then sleep comes about and the animal sleeps" (*Somn*. 456^{b}17–28).

Snub, the (*to simon*): Often used as an example of something whose definition involves a reference to an underlying subject, usually matter of some sort (*Ph*. 186^{b}22, *Met*. 1025^{b}31, 1030^{b}29, 1035^{a}26).

Soft-bodied Animals (*malakia*): "All the ones which, being bloodless, have their fleshy part outside, and their solid part, if any, inside, as in the case of the blooded animals—for example, the cuttlefish kind" (*HA* 523^{b}3–4). The cephalopods.

Soft-scaled (*lepidôtos*): E.g., fishes.

Soft-shelled Animals (*malakostraka*): "All the ones that have the solid part outside and the soft fleshy part inside; the hard part of these is not receptive of impressions but is shatterable" (*HA* 523^{b}6–7). The crustaceans.

Solidify (*pêgnunai*): (1) Solidification is "a sort of drying" (*Mete*. 382^{b}1). It is what water and liquids that we speak of as "freezing," as well as blood and milk, which we speak of as "congealing," undergo. (2) "Things that solidify solidify because they are

either water or a mixture of earth and water, and do so due to either dry heat or cold" ($382^{b}31–33$).

Sôma: **Body**

Sophia: **Wisdom, Theoretical**

Sophist (*sophistês*): *Sophistês* stems from *sophos* ("wise"). The sophists, who first appear in Athens in the mid-5th cent BC, were itinerant, fee-charging teachers of rhetoric, ethics, and other subjects relevant to public life, and Aristotle sometimes refers to them as such (*Pol*. $1280^{b}11$). More often, though, he represents the sophists in a negative light as pretenders to philosophical knowledge and employers of sophistical or fallacious arguments: "Sophistry is apparent wisdom, not real wisdom; and a sophist is someone who makes money from apparent but not real wisdom" (*SE* $165^{a}21–23$). (*SE* is devoted to an examination of such arguments. Other significant discussions are found at *Met*. $1004^{b}17–26$, $1026^{b}14–24$, $1061^{b}5–11$, *Rh*. $1355^{b}15–21$, and more causal remarks of the same negative tenor at *APo*. $71^{b}10$, $74^{b}23$, *Top*. $126^{a}31$, *Ph*. $219^{b}20$.) This negative attitude was not special to Aristotle. It was also shared by Plato, and by Athenians more generally, who were not always careful to distinguish sophists from other thinkers and teachers. A decree introduced sometime in the 430s BC provided for the impeachment of "those who do not believe in what has to do with the gods or teach theories about what is up in the sky" (Plutarch, *Pericles* 32.32)—teachings which identified one as a sophist (Plato, *Apology* 19b–d). It may be that this decree was the legal basis of Socrates' indictment in 399 BC, and for that of many other intellectuals, including Anaxagoras, Diagoras, Protagoras, Euripides, and later, in 323/2, of Aristotle himself (F223). A reference to this may lie behind the claim at *Rh*. $1397^{b}24–25$ that "if generals are not base because they are often put to death, neither are sophists."

Sôphrosunê: **Temperance**

Sort of Thing (*poion*): An account or definition consists of a kind and a difference (*Met*. $1027^{b}29–30$), of which the kind is stated first: "the kind . . . is meant to signify the what-it-is, and, of the things mentioned in the definition, is put first" (*Top*. $142^{b}27–29$). Sometimes both elements are included in the what-it-is: "the kinds and the differences are predicated in the what-it-is" ($153^{a}17–18$; also *APo*. $91^{b}28–30$, $97^{a}23–25$). But sometimes the kind tells us what the thing is while the differences tell us what sort or quality of thing it is: "no difference signifies a what-it-is but rather a quality" (*Top*. $122^{b}16–17$; also $128^{a}26–27$, *Met*. $1020^{a}33$).

Soul (*psuchê*): Unlike souls as we conceive them, which are supposedly found only in "higher" beings like us, Aristotelian souls are found wherever there is life and movement: souls are animators; animate things are ensouled. All plants and animals, however primitive or simple, have some sort of soul. Moreover, unlike Cartesian souls or souls as conceived by some religions, Aristotelian souls (the understanding aside) are tightly tied to the bodies whose souls they are: "It is necessary, then, for the soul to be substance as

form of a natural body that has life potentially" (*DA* 412^{a}20–21). An ensouled body is thus a matter-form compound whose body is matter and whose soul is form. Although the various sorts of soul are found separated from each other in other living things, they are also found hierarchically organized within the human being, with higher ones presupposing lower ones (*Pol*. 1333^{a}21–30, 1334^{b}15–17). On the lowest rung in the hierarchy is nutritive soul, responsible for nutrition and growth. It is the only sort of soul possessed by plants. The next rung up is perceptual soul, responsible for perception and for the feeling and appetite that cause animal movement. Together with nutritive soul it is found in all animals. In human beings, both are constituents of the non-rational part of the soul. The third sort of soul, found only in human beings, is rational soul, which comprises the part of the soul that has reason and the understanding. Looked at from the bottom up rather than from the top down, this hierarchy is teleological: lower sorts of soul and their works are for the sake of the higher ones. The uniform parts, such as flesh, and their works thus exist for the sake of the non-uniform or structured parts and their works. Among the latter parts, the perceptual organs are particularly important with regard to survival, which is essential for all other functioning (*DA* 434^{a}21–^{b}24). In animals with rational soul, the perceptual modalities (especially smell, hearing, and sight) "report many differences, from which practical wisdom concerning intelligible objects and things doable in action comes about" (*Sens*. 437^{a}2–3), and so also exist for the sake of the good. Finally, practical wisdom, though it exists for its own sake, also exists for the sake of the understanding (*NE* 1145^{a}6–9). Understanding, then, is at the teleological peak of the organization, and so is the final or teleological cause of everything else in it.

Soul, Parts of: Aristotle uses terms ending in *-ikon* in his discussions of the soul and its functions—for example, *aisthêtikon* (*DA* 432^{a}30), *bouleutikon* (†*MM* 1196^{b}16), *dianoêtikon*, *doxastikon*, *epistêmonikon* (*NE* 1139^{a}12), *epithumêtikon* (1102^{b}30, 1119^{b}14), *logistikon* (1139^{a}12), *orektikon* (1102^{b}30), *phantastikon* (*DA* 432^{a}31), *phutikon* (*NE* 1102^{b}29), *threptikon* (*Juv*. 468^{a}28), *thumikon* (*DA* 432^{a}25, 433^{b}4). Sometimes he uses the term "part (*meros*, *morion*)" to refer to some of these: the *aisthêtikon* is the "perceptual part" at *Ph*. 247^{a}17 and the *noêtikon* the "understanding part" at 247^{b}1; the *dianoêtikon* is the "thinking part" at †*MM* 1182^{a}18. Sometimes, he omits the term, but it seems implied, so that, e.g., the *doxastikon* is "the believing part" at *DA* 413^{b}30 (notice *moria* at 413^{b}28), while *to phantastikon* is the "imaginative part" at 432^{a}31 (notice *moria* at 432^{b}2).

Parts can be separable from other parts: the nutritive part is separable from all the other parts (*DA* 411^{b}27–30, 413^{a}25–^{b}9, 434^{a}22–30, ^{b}9–25); the perceptual part, while not separable from the nutritive, is separable from the rationally calculative or deliberative part (*DA* 433^{b}30–31, *NE* 1149^{a}9–11, *Pol*. 1260^{a}12); the understanding part is separable from the other parts even in animals that have both it and them (*DA* 408^{b}18–26). Parts can also be inseparable parts of other parts: it would be "absurd" to break up the *orektikon* ("desiring part"), which comprises the *epithumêtikon* ("appetitive part") and the *thumikon* ("spirited part") (432^{b}5–6).

Parts can be identical, like the *logistikon* and the *doxastikon* (*NE* 1140^{b}26), but differ in being (*Insomn*. 459^{a}15–17). They can also, which may amount to the same thing, be distinct in account: "the remaining parts of the soul are not separable . . . ; but that they are distinct in account is evident; for the perceptual part and the believing part are distinct, if indeed perceiving and believing are, and similarly for each of the others mentioned" (*DA* 413^{b}27–32); or "both in account and in capacity" (432^{b}3–4).

It is clear, then, that calling things "parts" of the soul should not be taken to imply that they are separable parts of it or that they are distinct from other things called "parts." As Aristotle himself puts it: "which of them [the imaginative part] is the same as and which it is distinct from involves much puzzlement, if one is to posit separate parts of the soul" (*DA* 432^{b}2–3; cf. *NE* 1102^{a}28–32). About the distinction between a soul's parts and its capacities too he signals some indifference: "Let us now, then, leave aside the other parts or capacities of the soul (whichever they should be called)" (*Juv*. 467^{b}16–18).

Soul-involving (*psuchikon*): Both starting-points (*GA* 737^{a}8, 751^{b}6, 762^{a}26, 762^{b}17) and heat (732^{a}18, 739^{a}11, 752^{a}2, 755^{a}20, 762^{a}20) are said to be soul-involving. See **Breath**

Sound (*psophos*): "The movement of something that can be moved in the way in which things bounce back from a smooth surface when someone strikes it" (*DA* 420^{a}21–22).

Spatial Movement (*phora*): (1) Usually movement with respect to place (*Top*. 122^{a}22–30, *Ph*. 243^{a}35–40), but sometimes distinguished from it (*Top*. 122^{b}31–35). (2) "Spatial movements caused by something else are of four forms: pulling, pushing, carrying, and rotating" (*Ph.* 243^{a}16–17).

Special Affection (*idion*): (1) "A special affection is one that does not indicate the essence of a thing, belongs to that thing alone, and is counterpredicated of it. Thus it is a special affection of humans to be receptive of grammar; for if someone is human, he is receptive of grammar, and if he is receptive of grammar, he is human" (*Top*. 102^{a}18–22). (2) "But since of what is special one part signifies the essence and another part does not signify it, let us divide what is special into both of the parts just stated, and let us call the part that signifies the essence a 'definition,' while the remaining part, in keeping with the name commonly assigned to them, may be called a 'special affection'" (101^{b}19–23). Putting (1) and (2) together shows that there are two sorts of Aristotelian special affections: (3) definitions, which are obviously counterpredicated of what they define, but do express the essence of the thing defined (101^{b}21–22, 101^{b}38); (4) those that are counterpredicated of their subject (so that each is predicated of the other) but are not—or do not signify, or express—its essence, and so are not definitions. Those in (4) are Aristotelian special affections in the strict sense; those in (3) are special affections in an extended sense. To these we may add (5) a popular sense, in which A is special to B if and only if A always accompanies B and belongs to B alone (*Top*. 122^{a}22–28, 131^{b}8–9). (6) A further, temporal sense gives us now-special affections

(131^{b}5). In this sense, A is a now-special affection of B if and only if at the time that is now, A is either a strict or popular special affection of B.

Special Object of Perception (*idion*): "Whatever cannot be perceived by another perceptual modality, and which we cannot be deceived about—for example, sight is of color, hearing of sound, taste of flavor, while touch has several different ones" (*DA* 418^{a}11–14).

Speculation, Observation (*theôrêma*): A *theôrêma* is an object of contemplation (*Mem*. 450^{b}26, *NE* 1066^{a}26), so that *theôrêmata* (plural) are often theoretical views or speculations (*Somn*. 455^{a}25, *Mete*. 345^{b}2), such as the mathematical speculations mentioned at *Met*. 1093^{b}15. But they can also be (perhaps theory-laden) observations, like the astronomical ones mentioned at *Mete*. 339^{b}8.

Speech (*dialektos*): "The articulation of voiced sound by means of the tongue" (*HA* 535^{a}30–31).

Speech (*lexis*), **Parts of**: Distinguished and defined in *Po*. 20.

Sperma: **Seed**

Spine, Fish-spine (*akantha*): The analog of bone in boneless animals (*HA* 511^{b}6–7), but also the spines on a hedgehog (517^{b}24) and the like.

Spiral Shell (*strombôdês*): When the term is hyphenated ("spiral-shell") it refers to the animal; when unhyphenated it refers to the shell.

Spirit (*thumos*): Aristotle often uses *thumos* and *orgê* ("anger") interchangeably (*Rh*. 1369^{b}11), and very often uses *thumos* in contexts where its aggressive side is highlighted (*NE* 1116^{b}23). In other places, however, he says only that anger is "in (*en*)" the spirited part (*Top*. 113^{a}36, 126^{a}10), alongside other feelings, such as fear and hatred (126^{a}8–9). He also identifies spirit as the source not just of "negative" feelings but also of love and friendship: "spirit is what produces friendliness; for it is the capacity of the soul that makes us disposed to love" (*Pol*. 1327^{b}40–1328^{a}1). This is in keeping with his claim that if hatred is in the spirited part, then love, as its contrary, must be there too (*Top*. 113^{a}33–^{b}3). Presumably, then, we should think of spirit as passionate—"hot and hasty" (*NE* 1149^{a}30)—rather than as always aggressive.

Spit-lamp (*obeliskoluchnion*): A military tool that could be used either as a roasting spit or as a lamp holder (*PA* 683^{a}25, *Pol*. 1299^{b}10).

Sponsor (*prostatês*): See **Champion**

Spontaneous (*automaton*): Living beings that come to be by chance are said to come to be spontaneously or to be spontaneously generated from "some sort of composition from a seed-like starting-point" (*HA* 539^{a}18). The fullest catalog is given in *HA* 5.19.

Spoudaios: **Excellent**

Standard (*kanôn*): (1) "By the straight we know both itself and the crooked; for the standard straightedge is a judge of both, while the crooked is a judge neither of itself nor of the straight" (*DA* 411^{a}5–7). (2) "Each state [of character] has its own special set of things that are pleasant or noble, and the excellent person is perhaps distinguished most by his seeing what is true in each case, since he is like a standard and measure of them" (*NE* 1113^{a}31–33). (3) "The standard of what is indeterminate is itself indeterminate, just like the lead standard used in Lesbian-style building; for the standard is not fixed but adapts itself to the shape of the stone" (1137^{b}29–32). (4) "The wish of human beings . . . is not a safe standard" (*Pol*. 1272^{b}6–7). (5) "One should not distort [the judgment of] the judge by arousing anger, fear, or pity in him; for this would be as if someone who is going to use a standard [first] made it crooked" (*Rh*. 1354^{a}24–26).

Star (*astêr*, *astron*): *Astêr* refers to a planet at *Mete*. 343^{b}30, 33, but to a fixed star at *Cael.* 298^{a}3. *Astron* (usually in the plural: *astra*) is used explicitly for both fixed stars and planets (*Mete*. 346^{a}2) in contrast to the sun and moon (*Cael.* 278^{b}18, 292^{a}1), and for planets in contrast to these (*Mete*. 341^{a}22). It seems to be used less frequently for the shooting stars and comets (346^{b}12) than *astêr*, which is used for shooting stars (341^{a}33, 341^{b}3, 28, 34, 342^{b}4, 21, 344^{a}15, 28, 32) and for comets (343^{b}5, 344^{a}20, 34, 345^{b}12, 35).

Starting-point (*archê*): "The cause of many things, with nothing above it being a cause of it" (*GA* 788^{a}15–16; also *EE* 1222^{b}30–31). There is no demonstration of starting-points (*GA* 742^{b}32–33); scientific knowledge of them is provided by understanding (*NE* 1141^{a}7–8). A common translation of *archê* is "first principle," but as a uniform translation "starting-point" is preferable. See **Rule**

Stasis: **Faction**

State (*hexis*): (1) When related to a privation, as in *Met*. 5.22, a *hexis* is a having. (2) When related to a capacity, a *hexis* is the penultimate stage in its development or completion of a capacity, and is a relatively stable condition (*Cat*. 8^{b}25–9^{a}13) ensuring that a thing is "well- or ill-disposed, and either intrinsically or with reference to something else" (*Met.* 1022^{b}10–12). (3) More narrowly, a state is a condition "due to which we are well or badly off in relation to feelings" (*NE* 1105^{b}25–26). (4) "The things in accord with which someone is of a certain sort in life; for lives are not of the same sort in accord with every state" (*Rh*. 1408^{a}29–30).

Statement: See *Logos*

Stear: **Suet**

Sterêsis: **Privation**

Stock, True to One's (*gennaios*): See **Breeding, Good**

Stoicheion: **Element**

Stomach (*koilia*): The term *koilia* sometimes refers to (1) the stomach plus the bowel (i.e., the intestinal tract as a whole) (*PA* 650^{a}13); (2) the stomach alone (673^{b}12);

(3) the bowel alone (*GA* 728^{a}15); (4) the first of a ruminant's four stomachs, or the entire set of four (*HA* 507^{b}1–11).

Stomachos: **Gullet**

Strigil (*stleggis*): An instrument with a curved spoon-like blade used to scrape off sweat and dirt after exercising. At *Top*. 145^{a}23 it is a device for drawing off wine from a cask.

Strombôdês: **Spiral Shell**

Struphnos: **Astringent**

Studies in Circulation (*egkuklia*): See **External Accounts**

Study, System (*pragmateia*): Aristotle often refers to one of his investigations of a subject, regardless of its sort, as a *pragmateia* (*Top*. 100^{a}18, *Ph*. 194^{b}18, *NE* 1103^{b}26, 1105^{a}11), which is usually broader in connotation than what we would call a "treatise" (*SE* 183^{b}35). He also uses it to refer to a philosophical or other sort of system that might be embodied in many different treatises or practices (*SE* 183^{b}28, *Met*. 986^{a}8, 987^{a}30) and in a looser sense to any sort of business (*Top*. 155^{b}27) or dealings (*Rh*. 1376^{b}4).

Substance (*ousia*): *Ousia* is a noun that is perhaps formed from the present participle *ousa* of the verb *einai* ("to be"). "Substance" is the traditional translation. (1) The substance *of* something is its what-it-is or its essence. (2) *A* substance, on the other hand, is a this something—an ultimate subject of predication, of which a particular human or a particular horse are examples.

Substance, Primary: (1) "Substance in the strictest sense, that which is primarily and most of all called 'substance,' is what is neither said of any subject, nor is it in any subject—for example, a particular human or a particular horse. What are called 'secondary substances' are the forms that the things primarily called 'substances' are instances of, both these forms themselves and the kinds of these forms" (*Cat*. 2^{a}11–16). (2) "What is not said to *be* by being one thing in another, that is, in an underlying subject as matter" (*Met*. 1037^{b}3–4). (3) "What is intrinsically intelligible is the one column [of opposites], and in this substance is primary, and in this the one that is simple and in accord wth activity [is primary]" (1072^{a}30–32).

Substance, Secondary: "The forms that the things primarily called 'substances' are instances of, both these forms themselves and the kinds of these forms—for example, the particular human is an instance of the form human, and the kind of the form is animal" (*Cat.* 2^{a}14–19).

Suet (*stear*): A sort of concocted blood (*PA* 651^{b}6–7), like fat, but different in nature from it. Discussed in *HA* 3.17–18, *PA* 2.5.

Suggnômê: **Sympathetic Consideration**

Sugkrisis: See **Disaggregation**

Sullambanein: **Conceive**

Sullogismos: **Deduction**

Sumbebêkos: **Coincident**

Sumbolon: **Token**

Sumperasma: **Conclusion**

Sunesis: **Comprehension**

Sunolon: **Compound**

Sunthesis: **Composition, Composite**

Superfetation (*epikuêma*): For Aristotle superfetation occurs when eggs produced at two different periods are fertilized by earlier and later impregnations, but it can also occur when eggs produced at the same period are fertilized by two different impregnations (this is now called superfecundation). It is discussed in *GA* 4.5.

Supervision (*epimeleia*): Supervision (*epimeleia*) of X, which involves taking care of (*epimeleisthai*) X, is often exercised by a type of craft or science that has X's welfare as its end or goal: a king supervises his subjects to ensure that they do well (*NE* 1161^{a}13), medicine supervises the sick with the aim of making them healthy (1180^{b}17), and "the gods exercise a sort of supervision over human affairs" and "reward those who most like and honor [understanding]" (1179^{a}24–29).

Supposition (*hupolêpsis*): *Hupolêpsis* is like belief, but unlike scientific knowledge, in that it can be false as well as true (*NE* 1139^{b}17). It differs from belief in that what one believes is "already a sort of affirmation" (1142^{b}14), whereas "*hupolêpsis* is that by which we play a double game with everything, as to whether it is so or not so" (†*MM* 1197^{a}30–31). See **Double Game, Play A**

Surface (*epiphaneia*): Often used as an equivalent of *epipedon* ("plane").

Sussitia: **Communal Messes**

Sustasis: **Composition**

Sustoichia: **Column**

Swift (*drepanis*): Literally, "sickle-bird" (from the shape of its wings). Its precise identity is unclear. Perhaps, in particular, the Alpine swift.

Sycophant (*sukophantês*): Athenian law provided rewards to those who successfully prosecuted cases that enriched the city (such as recovered tax revenues or property confiscated because of the offense). By the late 5th cent BC this led to the practice of sycophancy, which consisted in bringing (often bogus) suit against someone in hopes either of getting a bribe from him for dropping the suit or of getting a reward from the city if the suit proved successful.

Syllogism: See **Deduction**

Sympathetic Consideration (*suggnômê*): Discussed in *NE* 6.11.

Synonymous (*sunônumos*): "Things are said to be synonymous when they have both a name in common and the account that corresponds to the name is the same—for example, both a human and an ox are animals; for each of them is called by the same name, 'animal,' and, moreover, the account is the same; for if one gives an account of what it is for each of these to be what it is, an animal, one will give the same account" (*Cat*. 1[a]6–12).

Teaching (*didaskalikê*): *Didaskalikê* is essentially language based (*HA* 608[a]17–21). In the strict sense, it involves formal instruction in a craft or science that results in scientific knowledge of causes: (1) "Those people teach who state the causes of each thing" (*Met*. 982[a]29–30). (2) "Argument in accord with scientific knowledge is teaching" (*Rh*. 1355[a]25–26).

Technê: **Craft**

Technitês: **Craftsman**

Tekmêrion: **Proof**

Teleios: **Complete**

Telos: **End**

Temperance (*sôphrosunê*): Focally discussed in *NE* 3.10–11, *EE* 3.2. See **Virtue, Human**

Teras: **Monstrosity**

Term: See **Defining Mark**

That, the (*to ti*), **the Why** (*to dia ti*): "Experienced people know the that but do not know the why, while craftsmen know the why, that is, the cause" (*Met*. 981[a]28–30). The focal discussion is *APo*. 1.13.

The + Noun: Noun phrases consisting of the definite article plus a noun ("the N") are ambiguous (homonymous) in English, since they can be either singular terms referring to unique particulars ("The dog bit me") or generic terms ("The dog is a domestic animal"). Similarly in Greek "something is said to be the circle homonymously, [since the term is applied] both to the one said to be such unconditionally [the generic or universal circle] and to the particular one" (*Met*. 1035[b]1–3). In the biological treatises (*HA*, *PA*, and *GA*), the + noun ("the human being," "the sheep") generally refers to the kind, not to a particular instance of the kind.

Theôrein: See **Practical**

Theôrêma: See **Speculation**

Theoretical Grasp on, Get a (*theôrein*): The verb *theasthai*, with which *theôria* is cognate, means "to look at" or "gaze at" or "view." Hence *theôria* itself is sometimes what someone is doing in contemplating, investigating, looking closely at, observing, or viewing (as at *Po*. 1450^{b}38, 1451^{a}1) something. *Theôria* can thus be an exercise of understanding (*nous*), which is the element responsible for grasping scientific starting-points (*NE* 1141^{a}7–8), such as (the definition of) right angle in the case of geometry or (the definition of) happiness in the case of ethics and politics. As a result, the verb *theôrein* sometimes means "to be actively understanding" or "to be actively contemplating" something. Often "get a theoretical grasp on" seems to convey the right sense.

Theôrêtikos: See **Practical**

Theôria: **Theoretical Investigation**

Theos: **God**

Thêriôdês: **Beast-like**

Thês: **Laborer, Hired**

Thesis (*thesis*): Defined at *Top*. 104^{b}19–35.

Thin (*leptos*): See **Coarse-grained**

Third man (*tritos anthropos*): The argument is mentioned at *SE* 178^{b}36–37 and *Met*. 990^{b}17, given at F174 (83.1–85.12), discussed in some detail at *Met*. 1031^{b}28–1032^{a}4, and the problem with it succinctly characterized at 1038^{b}34–1039^{a}3.

This (*tode*), **This Something** (*tode ti*)
Tode ti involves a particularizing element and a generalizing element. Here the demonstrative pronoun *tode* is taken as particularizing (as suggested by *Met*. 1030^{a}5–6) and the indefinite pronoun *ti* as generalizing, but since *tode* need not be particularizing (as it may not be at 1032^{b}6–21) and *ti* may be, it is possible to go the other way and translate as "thing of a certain sort."

In very many cases, being a *tode ti* is a distinctive mark of an *ousia* ("substance"), and so has some share in the ambiguity of the latter, as between an ultimate subject of predication and the substance or essence of something. This is reflected in the fact that a particular man and a particular horse are primary substances (*Cat*. 2^{a}11–14), so that "it is indisputable and true that each signifies a *tode ti*" (3^{b}10–12), while at the same time what is separable and a *tode ti* is "the shape or form of each thing" (*Met*. 1017^{b}24–26; also 1042^{a}27–29, 1049^{a}35, 1070^{a}11). Some things, though, are one and the same as their forms or essences—which would remove the ambiguity at least in their cases—but it is not true that all are (1037^{a}33–^{b}7).

As strong as the connection between substance and being a *tode ti* is the disconnection between being a *tode ti* and being a universal—"no common thing signifies a this

something but a such-and-such sort of thing" (*Met*. 1003^{a}8–9; also 1039^{a}15–16)—and the connection between being substance and being a *kath' hekaston*: "If one does not posit substances to be separate, and in the way in which the *kath' hekasta* are said to be separate, one will do away with the sort of substance we wish to maintain" (1086^{b}16–19). Apparently, then, a form that is a primary substance—as some are explicitly said to be (1032^{b}1–2)—must be a *kath' hekaston*.

A *kath' hekaston*, in turn, is "one in number" (*Met*. 999^{b}34–1000^{a}1), so that no two things can be one and the same *kath' hekaston*. Hence it is translated as "particular." But it is also possible to take "one in number" to mean "indivisible" or "individual," so that like an ultimate difference—identified with form and substance at 1038^{a}25–26—something is *kath' hekaston* because it cannot be further divided or differentiated.

As we try to disambiguate *tode ti*, then, we run into ambiguities that parallel the initial one in substance itself, or that are related to it. That this may be no accident, but rather the heart of the issue, is suggested by *Met.* 1087^{a}19–21.

Finally, a point about matter. What *Ph*. 190^{b}25 refers to as "countable matter," and treats as a generalization of such things as the human and the bronze, is "more a this something," as, no doubt, is the "this (*todi*) wood of this [box]" at *Met*. 1049^{a}24 and the "this (*toudi*), which is bronze" at 1033^{b}2, from (some or all of) which the smith makes this brazen sphere. But these are particular identifiable and countable parcels of matter—minimally shaped up by form, perhaps, but enough to count as (low-grade) *tade tina*. Matter taken more generally, however, is "what not being actually a this something is potentially a this something" (1042^{a}27–28).

Thorax: "The cavity from the neck to the sex organs is called the 'thorax'" (*HA* 491^{a}29–30).

Thoros: **Seminal Fluid**

Thought (*dianoia*): *Dianoia* is often contrasted with the body (*Pol*. 1270^{b}40, 1335^{b}16–17), making "mind" seem a natural translation of it. But unlike the mind, which includes perception, imagination, belief, knowledge, and desire, *dianoia* is contrasted with each of these. It is not perception because all animals have that, while "many do not have *dianoia*" (*DA* 410^{b}24). It is not imagination because, as we might put it, *dianoia* is propositional, or operates on things that can be true or false, affirmed or denied (*Pol*. 1273^{a}22), while imagination is a representational state that is more like perception, more "imagistic." Hence "what affirmation and denial are in the case of thought, that, in the case of desire, is precisely what pursuit and avoidance are" (*NE* 1139^{a}21–22). Unlike belief and knowledge, however, "thought is not yet affirmation" (1142^{b}13), making it natural to think of it, or some of it anyway, as the process of reasoning that can culminate in a belief or an affirmed proposition. *Dianoia* is not desire, because, while desire can cause animal movement, without thought, as it does in the case of non-rational animals, "thought by itself . . . moves nothing" (1139^{a}35–36).

Thrattai: Perhaps shad; the identity is uncertain.

Ti, to: **That, the**

Ti, to dia: **Why, The**

Tiktein: Birds and fishes "lay" eggs (or in the latter case "spawn"), insects "produce" larvae, animals (including human beings) "give birth." Aristotle uses the verb *tiktein* for all of these.

Time (*chronos*): (1) "Time is a number belonging to movement with respect to the before and after" (*Ph*. 220^{a}24–25). (2) "Time is a measure of movement" (220^{b}32–221^{a}1) that does its measuring by "defining some movement that will measure out the whole (just as the cubit measures length by defining some magnitude that will measure out the whole), and for a movement to be in time is for both it and the existence of it to be measured by time" (220^{b}32–221^{a}5). A unit of time is something like a least discernible length of time—call it "one second." Seconds, then, are the units in which the time taken by a spatial movement M is measured. To ask how long M is is thus to ask what number of seconds M takes. And the way to determine that number is to tick off a second S_1 at the now (or instant) at which one second has passed since the start of M, S_2 at the now at which one more second has passed, and so on, until at S_n a now is reached at which M finishes. The length of M is n seconds. And the now, because of the role it plays in determining n, is like a unit of time.

Timê: **Honor**

Timêma: **Property Assessment**

Timios: **Estimable**

To ti ên einai: **Essence**

To ti esti: **What-it-is, the**

Token (*sumbolon*): *Sumbola* (plural) were originally two pieces of a bone or coin that uniquely fit together, enabling a person with one to recognize a person with the other. At *GC* 331^{a}24 Aristotle uses *sumbolon* to refer to a difference shared by two consecutive elements, like the cold in earth and water. When water becomes earth, then, only one difference has to be changed (dry to wet), which makes that change easier than one in which both differences have to be changed.

Tokos: **Offspring**

Topic (*topos*): "Dialectical and rhetorical deductions are those concerned with what we call 'topics,' which are common when they concern what is just, what is natural, what is political, and many things that differ in form—for example, the topic of the more and the less" (*Rh*. 1358^{a}10–14). These topics, moreover, are the elements of enthymemes (the rhetorical equivalent of dialectical deductions): "By 'element' and 'topic' of an enthymeme I mean the same thing" (1396^{b}22). Two sorts of things in a deduction are what we might intuitively call "elements," namely, premises and a logical form determi-

native of the deduction's syllogistic mood, which is something like a rule of inference. And in fact common things seem to include such rules or premises expressing them: "By 'the starting-points of demonstration' I mean the common beliefs on the basis of which we all prove things, such as that in every case it is necessary either to affirm or deny, and that it is impossible for something at the same time to both be and not be, and any other propositions like that" (*Met*. 996^{b}27–29). In keeping with this idea is the identification of topics with acceptable beliefs (*Rh*. 1402^{a}32–34). Apparently somewhat at odds with it is their characterization as something "into the province of which many enthymemes fall" (1403^{a}19). But a common premise (or premise for a dialectical deduction) is also something that can serve as a mnemonic device—a *topos*—for arguments, and as such is an item into the province of which these arguments fall (*Top*. 163^{b}22–33). In one way topics are common premises; in another they are common premises serving as reminders of correlative arguments. They are thus at once headings in those catalogs of evidence that are all important in any science and items falling under them.

Trachutês: See **Roughness and Smoothness**

Tragedy (*tragô[i]dia*): Defined in *Po*. 6.

Tribe (*phulê*): In the system developed by Cleisthenes for Attica in 508/7 BC, the land was divided into three zones: city, shore, and inland. Each of these was in turn divided into ten sections called *trittyes*, to each of which was assigned between one and ten of the 139 existing settlements, including villages and towns, which were all called "demes." Three units, one drawn from each of the three zones, were put together to form a tribe. See *Ath*. 21.1–6.

Trophê: **Nourishment**

Trumpet Shell (*kêrux*): When the term is hyphenated ("trumpet-shell") it refers to the animal; when unhyphenated it refers to the shell.

Truth (*alêtheia*)

One sort of truth Aristotle recognizes is plain, or theoretical, truth, which is a feature of propositions, statements, or thoughts: "to say of what is that it is not, or of what is not that it is, is false, while to say of what is that it is, or of what is not that it is not, is true" (*Met*. 1011^{b}26–27). About such truth, as about scientific knowledge, he is a realist: "it is not because we truly think you to be pale that you are pale, but it is because of your being pale that we who say this grasp what is true" (1051^{b}6–9).

Another sort, practical truth, which is "truth in agreement with correct desire" (*NE* 1139^{a}30–31), is plain truth plus something. The idea is this: For an agent A's deliberation to be correct (a) it must result in a conclusion C prescribing that A do X, which in his circumstances is what best furthers his happiness. Moreover, (b) the desire D that comes about as a result of that deliberation must be correct, that is, it must be a desire to do X. And (c) D must be effective in producing X. When as a result A does

X, his action makes C a practical truth—something made true by a *praxis* or action. Notice: "the truth in practical matters must be judged from the works and the life; for these are what have the controlling vote" (*NE* 1179^{a}18–20).

A third sort of truth is "objectual" truth (*Met*. 1027^{b}18–33). Both it and falsity are present in objects, unless the objects are either simple (non-composite) or essences that involve no reference to matter, in which case only objectual truth can be present, since no combination or separation is involved in them (*Met.* 1051^{b}17–1052^{a}4): "Understanding is not like that in every case; on the contrary, that of the what-it-is in the sense of the essence is true, and is not something [predicated] of something. However, just as the seeing of a special object is true, but seeing whether the pale is a human or not is not always true, so it is also with [understanding] what is without matter" (*DA* 430^{b}27–31). See **Deliberation**; **Phrase**

Tuchê: **Luck**

Tupos: **Outline**

Tyranny (*turannis*): A deviant sort of kingship that consists in the rule of involuntary subjects (*Pol*. 1313^{a}14–16, 1314^{a}34–38) by one master, who aims at his own advantage rather than that of the community as a whole (1279^{b}6–7). It is a mixture of ultimate oligarchy and ultimate democracy (1310^{b}2–7), and is the worst constitution of all, and the one that is furthest from being a true constitution (1289^{b}1–2, 1293^{b}27–30). If a tyrant listens to good advice, however, he will rule in a more moderate way and will either be "nobly disposed to virtue or else half good, not wicked but half wicked" (1315^{b}9–10). The various sorts of tyranny, discussed in 3.14 and 4.10, include foreign kingship and dictatorship.

Unacceptable (*paradoxos*): Contrary (*para*) to belief (*doxa*), including acceptable belief, and so unacceptable as a premise or conclusion, particularly in dialectical argument.

Unconditionally, Simply (*haplôs*): The adjective *haplous* means "simple" or "single." The adverb *haplôs* thus points in two somewhat opposed directions: (1) To speak *haplôs* sometimes means to put things simply or in general terms, so that qualifications and conditions will need to be added later. (2) When opposed to what is complex, compound, or variegated, *haplous* means "simple" in the relevantly opposed sense (*HA* 603^{b}28–29). (3) Sometimes to be F *haplôs* means to be F unconditionally or in a way that allows for no ifs, ands, or buts (as at *Top*. 115^{b}29–35). In this sense, things that are F *haplôs* are F in the strictest, most absolute, and most unqualified way (*Met*. 1015^{b}11–12), so that what is unconditionally F is what is intrinsically F (*NE* 1151^{b}2–3). (4) *Haplôs* is also at times equivalent in meaning to *holôs* ("in general").

Underlying Subject, Condition (*hupokeimenon*): A *hupokeimenon* is often the underlying (*hupokeisthai*) subject that persists through change, as Socrates persists through

a change from being bearded to being clean-shaven. If the change in question is a substantial (or existence) change, so that it is the coming to be or passing away of a substance, as when Socrates dies, the *hupokeimenon* is matter.

Understanding (*nous*)
In the broadest sense of the term *nous* is what enables a soul to suppose, believe, deduce, calculate, reason, and believe, so that it is possible to *noein* something incorrectly (*DA* 427^{b}9). In the narrow sense, *nous* is what makes possible a type of knowledge of universal scientific starting-points that, unlike scientific knowledge proper, is not demonstrable from anything further (*NE* 1141^{a}7–8; also 1142^{a}25–26). This applies equally well in practical (1143^{a}35–^{b}5) or productive areas (*Met*. 1032^{a}32–^{b}17) as in theoretical ones.

In human beings, this *nous* is of two sorts, one productive or active, the other passive and analogous to matter (*DA* 3.5). Active *nous* may be the primary god himself or a divine substance (*NE* 1177^{b}28)—or anyway the most divine one—present in human beings (1177^{a}16), which, as such, shares in the immortality that is characteristic of gods (*DA* 430^{a}23). Consequently, it alone of these parts is separable from the human body and can survive its death (408^{b}18–25). Among sublunary animals this *nous* is fully possessed only by human beings (*PA* 656^{a}7–8, *NE* 1178^{b}24–25; cf. *HA* 610^{b}22). In fact, a human being is most of all his *nous* (*NE* 1168^{b}31–32, 1178^{a}2–8). In embryology too it is transmitted to offspring in a different manner than that of other types of soul (*GA* 736^{b}13–29).

Although often classified as a substance, *nous* is also sometimes classified as a state (*hexis*) of the soul that "grasps the truth by way of affirmation and denial" (*NE* 1139^{b}15). For in its case the distinction between a state and its activation collapses, since it is "in substance an activity" (*DA* 430^{a}18), though it must be in touch with an intelligible object in order to grasp the truth about it (*Met*. 1072^{b}20–21).

Uniform (*homoiomerês*): Something is uniform in the strict sense if its parts, however small, are of the same sort as the whole (*PA* 647^{b}17–20).

Unit (*monas*): "What is indivisible in quantity, when it is indivisible in all dimensions and lacks position" (*Met*. 1016^{b}24–25).

Universal (*to kath' holou*): (1) Universals (which include forms, qualities, and affections generally) are things that belong in common to many numerically distinct particulars (*Met*. 1038^{b}11–12), while particulars are things that are severally one in number and jointly many (999^{b}34–1000^{a}1). But sometimes what is *kath' hekaston* is what is less universal than something else. Thus, while perceptible particulars are indefinable (*Met*. 1039^{b}27–29, 1040^{a}27–^{b}4), it is "easier to define *to kath' hekaston* than the universal" (*APo*. 97^{b}28), and a definition of a universal divides it into *kath' hekasta* (*Ph*. 184^{a}23–24), where these are things that are particular in the sense of being "indivisible in form" (*PA* 644^{a}30–31). (2) A universal premise or proposition is one that holds in every case and always (*APo*. 96^{a}15). (3) In the *Poetics* the universal

is "the sort of thing that a certain sort of person would say or do, in accord with likelihood or necessity, which is what poetry aims at, while adding proper names" (1451^{b}8–10).

Universe, the: *to pan*

Unlimited (*apeiron*): "Nothing is actively unlimited, and is potentially so only in the direction of division" (*GC* 318^{a}20–21). The unlimited—or "infinite"—is focally studied in *Ph*. 3.4–8.

Unrefined (*banausos*, *phortikos*): When *banausos* is applied to crafts, it is defined and distinguished from *phortikos* and *chrêmatistikos* as follows: (1) "By *phortikos* I mean those undertaken with a view to reputation only; by *banausos* I mean the sedentary ones and wage-earning ones; by *chrêmatistikos* I mean the commercial ones related to buying and selling" (*EE* 1215^{a}30–33). (2) "Any work should be considered *banausos*, and so too any craft or branch of learning, if it renders the body, the soul, or the thought of free people useless for the uses and actions of virtue" (*Pol*. 1337^{b}8–11). However, Aristotle's use of the terms is not always consistent with these definitions. The most *phortikos* people suppose happiness to be bodily pleasure (*NE* 1095^{b}16), to show oneself superior to humble people is *phortikos* (1124^{b}22), as is going to excess in trying to make people laugh (1128^{a}5) and praising the gods for being temperate (1178^{b}16). A person who spends more than one should is *banausos* (1123^{a}19), and *banausia* itself consists in "being extravagant in circumstances one shouldn't and in ways one shouldn't" (1122^{a}32–33), but many other things that have nothing to do with the use of wealth are also *banausos*, such as playing music rather than listening to it (*Pol*. 1339^{b}9, 1340^{b}34, ^{b}41, 1341^{a}7, ^{b}14), though some of the pleasure it produces is *phortikos* (1341^{b}13). Not to work at any *banausos* craft is noble, "for it is characteristic of a free person not to live in dependence on others" (*Rh*. 1367^{a}32), while a craft concerned with delivery is *phortikos* (1404^{a}1). A common translation of these terms is "vulgar," but in the relevant sense this is not now in common use.

Unscrupulous (*panourgos*): An unscrupulous person is ready to do anything, and so "tries to get more in every way and from every source" (*EE* 1221^{a}36). That is to say, he takes as much as he can of money, honors, bodily pleasures, and other goods of the sort that are greed's particular targets (*NE* 1168^{b}15–21), regardless of to whom they belong. As applied to animals such as the fox (*HA* 488^{b}20), *panourgos* means "cunning."

Up, Down; **Front, Back**; **Right, Left**: See **Place, Proper**

Vapor (*atmis*): (1) "Disaggregated water" (*Mete*. 340^{b}3). (2) "A disaggregation due to burning heat, from liquid into air and wind, capable of wetting things" (387^{a}24–26).

Virtue (*aretê*): Anything that has a work has a correlative *aretê*, the state of it that enables it to do that work well (*NE* 1098^{a}8–11). It is thus possible to speak of the *aretê*

of thieves, scandalmongers, and other bad things that are good at doing what they do (*Met*. 1021^{b}17–20), as well as of the *aretê* of inanimate tools and instruments.

Virtue, Human

A virtue of character is a "deliberately choosing state, which is in a mean in relation to us, one defined by a reason and the one by which a practically wise person would define it" (*NE* 1106^{b}36–1107^{a}2). Virtue of character as a kind is a relative (*Cat*. 6^{b}15–16), but the particular virtues (courage, temperance) and vices (cowardice, intemperance) are qualities, as is true of states generally (11^{a}23–32). It has different degrees, levels, areas of usefulness, sorts of activation, degrees of accessibility, and relativities.

Degrees: Virtue of character may be natural, habituated, or virtue in the strict sense (*Pol*. 1332^{a}38–^{b}8). In the strict sense, it involves understanding of the correct end (*NE* 1144^{b}9) and the possession of practical wisdom (1145^{a}1–2), while natural virtue and habituated virtue do not. A person with virtue in the strict sense may fail to do what is virtuous "because of things that overstrain human nature and that no one could endure" (1110^{a}25–26) without compromising his claim to such virtue. Someone with heroic virtue, on the other hand, has a degree of virtue exceeding the ordinary (1145^{a}18–20), and can endure many such things, and act virtuously. By the same token, greatness of soul (4.3) seems to go beyond an ordinary degree of virtue in the strict sense, since not every fully virtuous person is virtuous enough to have it.

Levels: Regardless of their degree, some virtues are apparently at a higher level of excellence, because they are more complete than others: "the human good turns out to be activity of the soul in accord with virtue and, if there are more virtues than one, then in accord with the best and most complete" (*NE* 1098^{a}16–18).

Areas of usefulness: "Courage and resilience are for unleisure, philosophy for leisure, and temperance and justice are useful during both, and particularly when people remain at peace and are at leisure" (*Pol*. 1334^{a}22–25), while magnificence requires "great sums" in order to be exercised (*NE* 1107^{b}18).

Activations: An activation of a virtue may be unconditional or on the basis of a hypothesis: "By 'on the basis of a hypothesis' I mean the necessary ones, by 'unconditionally' I mean what is nobly [done]. For in the case of just actions, for example, just penalties and punishments spring from virtue, but are necessary, and nobly [done] has [the quality of] necessarily [done]" (*Pol*. 1332^{a}10–14).

Degrees of accessibility: How accessible the virtues of character are to a given person depends in part on the factors just mentioned. This may help explain the different things Aristotle says on the question (focally at *Pol*. 1332^{a}36–^{b}8). Sometimes he paints a somewhat bleak picture: "It makes no small difference, then, whether people are habituated in one way or in another way straight from childhood; on the contrary, it makes a huge one—or rather, *all* the difference" (*NE* 1103^{b}23–25; also 1104^{b}11–13). But ethical improvement, even for those less fortunate in their upbringing, seems to pretty much always be possible (*Cat*. 13^{a}22–31), provided one is "not disabled in relation to virtue" (*NE* 1099^{b}19).

Relativity to self and others: Virtue of character may be used in relation to another person or in relation to its possessor himself: "for many people are able to use their virtue in what properly belongs to themselves but unable to do so in matters relating to another person" (*NE* 1129^{b}33–1130^{a}1).

Relativity to gender and nature: All these features apply to virtues of character regardless of who has them or what sort of constitution their possessor is situated in. But the gender and natural status of their possessor has important consequences for the sort of virtue he or she can develop and possess in any political constitution: the virtues of men, women, and (natural) slaves are different, because their works are different (*Pol.* 1.13).

Relativity to a constitution: The virtues discussed in *NE*, *MM*, and *EE* are those of (primarily) a good *man*. But it is only in the best constitution (discussed in *Pol.* 7) that the virtues of a good man coincide with those of a good citizen; in others, the virtues are relative to the constitution (*NE* 1135^{a}5, *Pol.* 1293^{b}3–6, 1276^{b}30–1277^{a}5) and further its characteristic conception of happiness (*Pol.* 1328^{a}41–^{b}2).

The virtues of thought, which are focally discussed in *NE* 6, are practical wisdom and theoretical wisdom. The first is the virtue of the deliberative (or rationally calculative) sub-part of the part of the soul that has reason: it involves all the virtues of character, which cannot be possessed in their strict sense without it (6.13). The second is the virtue of the scientific sub-part, and is "the best and most complete" one referred to at 1098^{a}17–18.

Viscous (*glischros*): "A thing is viscous when, being wet or soft, it is pullable. . . . And those that are not of this sort are crumbly" (*Mete*. 387^{a}11–15).

Voice, Voiced Sound (*phônê*): A voice is what makes a voiced sound, and a voiced sound is the sort that is made by a voice. (1) "The blow struck on the so-called windpipe by the air that is breathed in, due to the soul in these parts, is voiced sound" (*DA* 420^{b}26–29). (2) "Voiced sound is a sort of sound belonging to something animate" (420^{b}5–6). (3) "Voice and sound are distinct, and speech is a third thing" (*HA* 535^{a}27–28). (4) "It is most of all to [human beings] that nature has assigned this capacity, because they alone among the animals make use of speech, and the matter for speech is voiced sound" (*GA* 786^{b}19–22). (5) "A voiced sound is a sign of what is pleasant or painful. . . . But speech is for indicating what is beneficial or harmful, and so too what is just or unjust" (*Pol.* 1253^{a}10–15).

Voluntary (*hekôn*), **Involuntary** (*akôn*): The fullest discussion is in *NE* 3.1, 3.5, *EE* 2.7–9.

Wanton Aggression (*hubris*): "Doing or saying things that involve shame for the one who suffers them, not in order that something or other [beneficial] may come about for the agent himself, or because something [bad] has happened to him, but in order to take pleasure in it" (*Rh.* 1378^{b}23–25). In what is perhaps a looser sense, wild animals can also exhibit it (*HA* 614^{a}10).

Water (*hudôr*): Also, rain.

Wealth (*chrêmata*): "Everything whose worth is measured by money" (*NE* 1119^{b}26–27).

Wealth Acquisition, Craft of (*chrêmatistikê*): Because of complexity in the notion of wealth, the craft or science of acquiring wealth is of at least two different sorts. The natural sort is concerned with the acquisition (but not the use of natural wealth, and is a part of (*Pol*. 1253^{b}12–13) or assistant to (1256^{a}3–7) the craft of household management. The unnatural sort is the craft of commerce. In *Pol*. 1.11 a third sort, which "comes between" these two, is discussed; it deals with metals and other things extracted from the earth, and timber and other non-foodstuffs grown on it (1258^{b}27–31).

Weasel (*galeê*): *Galeê* is the name of various animals, including weasels and polecats, some of which were kept as house pets.

Weight (*baros*): When *baros* is contrasted with *kouphos* or *kouphotês* ("light," "lightness") it is "heavy" or "heaviness," but when it applies to whatever has either heaviness or lightness it is "weight." It helps to think of the contrast, as Aristotle does, in terms of tendencies to move to proper places. If something naturally tends to move down toward the center it has some degree of heaviness; if it tends to move upward, away from the center, it has some degree of lightness.

Weight, Balance- (*rhopê*): (1) A's heaviness (weight) is its non-comparative tendency to move downward; its lightness, its non-comparative tendency to move upward (*Cael*. 308^{a}29–33). A's balance-weight is its weight or lightness in comparison to B's, when A is in one pan of a (fair) balance or weighing-scale and B is in the other. If the A-pan moves downward, A has a greater balance-weight of heaviness than B, and a smaller balance-weight of lightness. (2) A *rhopê* is also the tilt or turn of the balance itself, whether literal or figurative (*Juv*. 474^{b}31, 478^{a}16).

Wet (*hugros*): See **Dry**

What-it-is, the (*to ti esti*): When we ask *Ti esti A*? we are asking what A is. The correct answer defines or expresses the what-it-is of A, or (a related notion) the being (*einai*) for A, or (another related notion) the essence or what-it-is-to-be of A, or (yet another related notion) the substance of A. Any intrinsic being, regardless of its category, has a what-it-is: "The what-it-is signifies in one way the substance and the this something, and in another way it signifies each of the other things that are predicated—quantity, quality, and the like . . . ; for we can also ask what quality is, and so quality too is something with a what-it-is" (*Met*. 1030^{a}18–24).

White (*leukon*): The opposite of black (*melan*), where black is "the non-transparent" (*GA* 780^{a}34–35). Thus, while *leukon* is usually "white" or "pale," it comes closer, perhaps, to meaning "clear" or "bright," i.e., the color of light, so that, unlike its English equivalent, it can be applied to horses, dogs, water, and sound.

White Sickness (*leukê*): Mentioned at *HA* 518^{a}13, *GA* 784^{a}26. Perhaps albinism, since it can affect the hair as well as the skin.

Whole (*holos*): A *holon* (nominalized adjective) is typically a matter-form compound, which is not identical simply to the sum of its parts: at *Met*. 1052^{a}22 a whole is what has a certain shape and form by nature, and at 1016^{b}12–13 not being "some sort of whole" is identified with "not possessing one form." At 1045^{a}10 it is something beyond the parts and the cause of their being one, namely, a form (^{a}23). And at 1084^{b}30, "whole" goes together with "one" and "form." That is why the identity of a city is determined by its constitution (form) rather than by its inhabitants (matter) (*Pol*. 1276^{b}6–9).

Why, the (*to dia ti*): The causal explanation of why something is the case.

Wildness (*agriotês*): The contrary of tameness (*hêmerotês*), but not a difference in animals (*PA* 643^{b}8). *Agrios* when used to characterize a sort of wild animal (*HA* 598^{b}1, 607^{a}5) means "savage."

Wind (*anemos, pneuma*): Wind and air are more "a this something and a form" than earth is (*GC* 318^{b}29–33): earth is cold (privation) and dry (privation), while air is hot (positive) and wet (positive) (330^{a}30–^{b}7). A wind, which is analogized to a river or spring, is even more a this something, since it is not just air in movement, but has a specific starting-point and a distinctive cause (*Mete*. 360^{a}31–33): like an animal, "a wind too has a sort of life and a coming to be and passing away" (*GA* 778^{a}2–3). This helps explain why Aristotle finds it natural to use *pneuma* for both: a wind is, as it were, the earth's breath. By the same token, wind (as we too call it) of the sort that results in farts and belches occurs in animals (*HA* 637^{a}31, *PA* 672^{a}32). See **Breath**

Wisdom, Practical (*phronêsis*): (1) *Phronêsis* (verb *phronein*) in the broad sense refers to thought or wisdom of a general sort (*Met.* 1009^{b}13, 30, F84). (2) In a narrower sense, it refers to the distinctively practical wisdom discussed in *NE* 6.5, 6.7–9, 6.12–13, which is the virtue or excellence of the rationally calculative or deliberative part of the soul, which ensures that we aim at and hit the best good—happiness. (3) Sometimes it is equivalent in meaning to *sophia* ("theoretical wisdom"), with which it is usually contrasted. Though (2) is a distinctively human possession, Aristotle does sometimes attribute a weaker form (*HA* 588^{a}18–^{b}3) of it to non-human animals (488^{b}15, 9.6, *PA* 648^{a}6, *GA* 753^{a}10–17). (4) Since practical wisdom is the same state of the soul as politics, though differing from it in being (*NE* 1141^{b}23–24), what is said about the latter is also relevant to it (*Pol*. 1277^{b}25–30). See **Politics**

Wisdom, Theoretical (*sophia*): "Scientific knowledge of certain sorts of starting-points and causes" (*Met*. 982^{a}2–3), namely, "the primary starting-points and causes" (982^{b}9–10), or "the starting-points and the highest causes" (1003^{a}26–27). It is virtue of the scientific part of the soul (*NE* 1144^{a}15), the best and most complete virtue (10.8), and the most exact form of scientific knowledge (1141^{a}16–17).

Wish (*boulêsis*): Wish seems to be the quintessential thought-involving desire (*NE* 1139^{b}5): "all wish is in the rationally calculative part" (*Top*. 126^{a}13; also *DA* 432^{b}5, *Rh*. 1369^{a}1); "when something is moved in accord with rational calculation, it is moved in accord with wish" (*DA* 433^{a}24–25). But at *Pol*. 1334^{b}22–25 and elsewhere we are told that "spirit and wish, and appetite besides, are present in children straight from birth, while rational calculation and understanding are made by nature to arise as they grow." When wish is contrasted with deliberate choice, however, the point of contrast is this: "there is no deliberate choice of impossible things, and if someone were to say he was deliberately choosing them, he would seem silly. But there is wish for impossible things—for example, immortality" (*NE* 1111^{b}22–23). And when wish is understood in this way there is nothing especially rational about it, which makes it easy to see why children are said to have it. The reason that wish has these two apparently inconsistent aspects lies in its definition as a desire that is "unconditionally and in truth . . . [for] the good" but in each individual for "the apparent good" (1113^{a}23–24). As a desire for the apparent good, then, wish *is* present in children straight from birth, but with proper habituation and training it can come to be for the real good, and so to be properly responsive to the deliberation that best furthers it, by having its "starting-point and cause" (*EE* 1226^{b}20–21) in it.

Woman (*gunê*)

The soul of a woman is different from that of a man: "A slave does not have the deliberative part of the soul at all; the female has it but it lacks control (*akuron*); a child has it but it is incomplete" (*Pol*. 1260^{a}12–14). As a result the works of a man and a woman "are divided, those of a man being different from those of a woman, so they assist each other by putting their special works into the common [household] enterprise" (*NE* 1162^{a}22–24). Household management is thus "of distinct sorts for a man and a woman; for his work is to acquire property and hers to preserve it" (*Pol*. 1277^{b}24–25). Since virtue and work go together, their virtues are divided too: "for each of the parties involved [in the household] there is a different virtue and a different work" (*NE* 1158^{b}17–18); "men have the courage of a ruler and women the courage of an assistant, and the same holds of the other virtues" (*Pol*. 1260^{a}23–24).

When it comes to what makes a woman's deliberative part lack control, however, matters are somewhat unclear. It might be, as *NE* 1150^{b}15–16 suggests, that women are congenitally lacking in self-control, so that they cannot control themselves, or that, as less spirited than men (*HA* 608^{a}33–^{b}12, *PA* 661^{b}32–33), they are unable to control others. A difficulty for both views is that sometimes women succeed in controlling cities (*NE* 1161^{a}1–3), and so themselves too to the requisite extent.

The term *akuron* ("lacks control") is tied to the notion of a decree: beliefs are *akuron*, "insofar as these are like decrees" (*NE* 1151^{b}15–16), where "a decree is doable in action, as the last thing" (1141^{b}27–28) reached in deliberation. Since one way a decree can be *akuron* is by being invalid, as a result of not being issued by the proper body, the one with the authority to make laws and issue decrees, what makes a woman's deliberative part lack control would seem to be that it lacks such authority. Since law is

"understanding without desire" (*Pol.* 1287ª32), and understanding is what grasps such starting-points as the practical good, or happiness, the implication is that a defect in women's understanding must be what explains the defect in their deliberative part. But just what Aristotle thinks that defect is, it is difficult to say with confidence.

Womb (*mêtra*): The term *mêtra*, which is sometimes synonymous with the more technical *hustera* ("uterus") (*HA* 632ª25), also sometimes refers to the mouth of the uterus and cervix (510ᵇ11) or to the interior womb (586ª28, ᵇ11).

Word: *Logos*

Work (*ergon*)
An *ergon* in the strict sense is the use or actualization of a state, capacity, or disposition, so that an activity can be an *ergon* (*Met.* 1050ª21–23). In this case the traditional translation is "function." An *ergon*, however, may also be the further result of a work in the strict sense (*NE* 1094ª5, *EE* 1219ª13–19). Here the traditional translation is "product." But this further result, though it may be a product (*GC* 329ª17, *Met.* 1015ª9), may also be another activity, as in the case of activity in accord with practical wisdom and the virtues of character, which, while intrinsically valuable, is also for the sake of theoretical wisdom and activity in accord with it (*NE* 1145ª8–9, 10.7–8). To capture these three features of *ergon* in a uniform way, it is translated as "work." For "work" can be a verb ("they work in bronze"), a noun applying to a craft product ("a work in bronze"), or an action ("by their works ye shall know them"). In a further sense an *ergon* is simply a fact (*Pol.* 1268ᵇ39).

A thing's work in the strict sense is identical to its end or final cause (*EE* 1219ª9) and is intimately related to its nature, form, and essence: a thing's nature is its for-the-sake-of-which (*Ph.* 194ª28–29), its form is more its nature than its matter (193ᵇ6–7), and its essence and form are the same (*Met.* 1032ᵇ1–2). Hence all things are "defined by their work" (*Mete.* 390ª10), with the result that if something cannot do its work it has no more than a name in common with its working self (*PA* 640ᵇ33–641ª5, *Met.* 1035ᵇ14–25 *Pol.* 1253ª20–25). And a thing's good or doing well "seems to lie in the work" (*NE* 1097ᵇ26–27), though this holds only when the thing itself is not already something bad (*Met.* 1051ª15–16). Moreover, if something "is naturally composed of several capacities, it is clear that, of the several things it can naturally accomplish, the best of them is always its work" (F90 42.15).

Works are thus attributed to a wide variety of things, whether living or nonliving. These include plants (*GA* 731ª24–26) and animals generally (*NE* 1176ª3–5), including divine celestial ones (*Cael.* 286ª8–11), parts of their bodies and souls (*PA* 652ᵇ11, 686ª29), instruments or tools of various sorts (*EE* 1242ª14–19), crafts, sciences (1219ª17), philosophies (*Met.* 1037ª15) and their practitioners (*NE* 1141ᵇ10), cities (*Pol.* 1326ª13), and nature itself (1258ª35).

Wretched (*athlios*): Though *athlios* often has no ethical connotations (as at *NE* 1150ᵇ5), sometimes it does, so that someone dies in a wretched way when, unlike Priam, he dies in a way that shows him to be a wretch—someone lacking in virtue (1100ᵇ33–1101ª14).

Writ (*graphê*): A *graphê* was a specific sort of legal action in Athenian law, of which the *graphê asebeias* ("writ of impiety") brought against Socrates in 399 BC and described at Plato *Apology* 24b–c is a well-known example. A legislative speaker in the Athenian assembly was liable to a writ of illegality (*graphê paranomôn*) if he proposed legislation that contravened already-existing law. See **Denunciation**; **Indictment**

Xenos: See **Guest-friend**

Xêros: See **Dry**

Zêtein: **Inquire, Seek**

Zôê: See **Life**

Zô[i]on: See **Animal**

MEASURES AND CURRENCY

Length

1 fingerbreadth (*daktulos*)	= 19.3 mm, 0.76 in.
4 fingerbreadths	= 1 palm (*palaistê*) (77.1 mm, 3.04 in.)
12 fingerbreadths	= 1 span (*spithamê*) (231.2 mm, 9.10 in.)
16 fingerbreadths	= 1 foot (*pous*) (308.2 mm, 12.13 in.)
24 fingerbreadths	= 1 cubit (*pêchus*) (462.3 mm, 18.20 in.)
96 fingerbreadths	= 1 fathom, rod (*orguia*) (1.85 m, 6.1 ft.)
1,600 fingerbreadths	= 1 plethron = 100 feet (30.8 m, 33.7 yd.)
9,600 fingerbreadths	= 1 stade (184.9 m, 202.2 yd.)

Volume

Liquid

1 ladle (*kuathos*)	= 45.5 ml, 0.39 fl. oz.
6 ladles	= 1 *cotyle* (272.8 ml, 9.22 fl. oz.)
6 *cotyles*	= 1 *maris* (plural: *mareis*)
12 *cotyles*	= 1 *chous* (plural: *choes*)
1 *chous*	= 3.37 L, 6.9 gal.
144 *cotyles*	= 1 *metretes* (plural: *metretae*) (39.3 L, 10.4 gal.)

Amphora (*amphoreus*): A unit of measurement roughly equal to 9 gal.

Dry

1 basket (*kophinos*)	≈ 7.6 L
192 *cotyles*	= 1 Attic medimnus (plural: medimni)
	≈ 52 L (a "bushel" or 60 lbs. in weight)

Weight

1 drachma	= 4.31 gm, 0.152 oz.
1 Attic talent	= 60 minas (26 kg, 58 lbs.)
	= 6,000 drachmas
	≈ 58 lb., 26 kg.

Currency

1 obol	= 0.17 drachmas
1 drachma	= 4.31 gm, 0.152 oz. of silver

ANNOTATED INDEX OF PEOPLE AND PLACES

(Line numbers are to the Greek texts and are approximate in the translations.)

Abdera: 470[b]28, 742[b]20. Major city on the Thracian coast.

Abydus: 1305[b]32, 1306[a]31. City on the Asiatic coast of the Hellespont.

Acarnania: F210. Area in west-central Greece.

Acastus: *Ath*. 3.3. The second of the life archons after Medon.

Acastus: F222. Greek hero.

Achaea, Achaeans: 343[b]2, 366[a]26, 368[b]6, 1269[b]6, 1303[a]29, 1338[b]22. Region in the north-central part of the Peloponnese.

Achelous: 350[b]15, 352[a]35, 420[b]12, 535[b]18, 579[b]7, 606[b]15. River in western Greece.

Acherdus: *Ath*. 38.3. A deme of Athens.

Achilles: 97[b]18, 117[b]15, 24, 166[a]38, 239[b]14, 24, 548[b]1, 618[b]27, 1071[a]22, 1230[a]21, 1359[a]3, 1363[a]19, 1378[b]32, 1396[a]25, [b]12, 15, 1397[b]22, 1401[b]18, 1406[b]24, 1416[b]27, 1418[a]35. Greatest of the Greek heroes at Troy who, unlike the other Greek leaders, had not sworn to defend Menelaus' right to Helen (referred to at 1396[b]14–18).

Acropolis: 1400[a]32, *Ath*. 24.3

Acte: *Ath*. 42.3, 61.1. Peninsula south of Piraeus.

Adamas: 1311[b]22. Killer of Cotys.

Adrastus of Aphrodisias: F150. 2nd-cent BC Peripatetic philosopher.

Adriatic: 558[b]16, 598[b]16, 18, 749[b]29

Aeacus: 1418[a]36. Grandfather of Achilles.

Aedepsus: 366[a]29. City in Euboea.

Aegean Sea: 354[a]14, 598[a]26, [b]30, 1393[b]1

Aegeus: 1461[b]21. Archaic figure in the founding myth of Athens.

Aegina: 1015[a]25, 1025[a]25, 1291[b]24, 1306[a]4, 1396[a]19, 1411[a]14. Island in the Saronic Gulf.

Aegisthus: 1453[a]37. Lover of Clytemnestra, killed by Orestes.

Aegon: 350[b]11. Unidentified river.

Aegospotami: 344[b]32, *Ath*. 34.2. On the Hellespont.

Aenesidemus: 1373[a]22. Father of Theron, tyrant of Acragas (c. 489–473 BC).

Aenus: 1311[b]21. Town in Thrace on the trade route between the Black Sea and the Aegean.

Aeolian Islands: 367[a]3.

Aeschines: 1417[b]1. 4th-cent BC teacher of oratory.

Aeschylus: 633[a]18, 1111[a]10, 1388[a]7, 1449[a]16, 1456[a]17, 1458[b]20, 1458[b]22. 5th-cent BC Athenian tragic poet.

Aeschylus: 342[b]36, 343[a]27. Associate of Hippocrates of Chios.

Aesion: 1411^{a}25. Athenian orator.

Aesop: 356^{b}11, 663^{a}35, 1393^{a}30, 1393^{b}9, 23. Supposed author of fables.

Aetolia: F108, F210. Area north of the Gulf of Corinth.

Agamemnon: 166^{b}6, 1161^{a}14, 1285^{a}11, 1287^{b}14. Leader of the Greeks at Troy.

Agathon: 1139^{b}9, 1140^{a}19, 1230^{a}2, 1232^{b}8, 1392^{b}7, 1402^{a}9, 1451^{b}21, 1456^{a}18, 24, 30. Athenian tragic poet of the late 5th cent BC.

Agesilaus II: 1306^{b}35. Eurypontid king of Sparta (c. 400–360 BC).

Agesipolis: 1398^{b}32. King of Sparta (c. 394 BC).

Agyrrhius: *Ath*. 41.3

Ahura Mazda (Oromasdes): F19. Zoroastrian god.

Ajax: 97^{b}18, 117^{b}13, 24, 1456^{a}1. Greek hero at Troy.

Ajax of Theodectes: 1399^{b}28, 1400^{a}27, 28

Alcaeus: 1285^{a}37, 1367^{a}9. Lyric poet from Mytilene in Lesbos (born c. 620 BC).

Alcibiades: 97^{b}18, 578^{b}28, 1300^{b}29, 1390^{b}29, 1451^{b}11, F88. Athenian general and statesman (452–404 BC).

Alcidamas: 1373^{b}18, 1398^{b}10, 1406^{a}1, 9, 18, ^{b}11. 4th-cent BC rhetorician and student of the sophist Gorgias.

Alcinous: 1317^{a}13, 1455^{a}2. In Homer, the ruler of the Phaeacians.

Alcmaeon: *Ath*. 13.4

Alcmaeon of Croton: 405^{a}29, 492^{a}14, 581^{a}16, 752^{b}25, 986^{a}27, 1110^{a}28, 1397^{b}3. 5th-cent BC author.

Alcmaeonids: *Ath*. 19.3, 28.2. Prominent Athenian family.

Alcman: 557^{a}2. Choral poet from Sparta (fl. 7th cent BC).

Alcmeon of Theodectes: 1397^{b}3

Alcyione: 1274^{a}35

Alexamena of Styra: F106. Early writer of dialogs.

Alexander of Aphrodisias: F7, F58, F59, F145, F191. 2nd- and 3rd-cent AD Aristotelian commentator.

Alexander of Molossia: F218. King of Epirus (c. 370–331 BC).

Alexander the Great: F99

Alexias: *Ath*. 34.2

Alope of Carcinus: 1150^{b}10

Alopeconnesus: 598^{a}22. City on the western coast of Thrace.

Alphesiboa: 1397^{b}5. Character in Theodectes' Alcmeon.

Amadocus I: 1312^{a}14. Thracian king of the Odrysae (a union of Thracian tribes).

Amasis: 1259^{b}8, 1386^{a}19. King of the Egyptians (596–525 BC).

Ambracia: 1303^{a}23, 1304^{a}31, 1311^{a}40, *Ath*. 17.4. Colony of Corinth in northwest Greece.

Amisus: 554^{b}15. City on the coast of Asia Minor.

Ammon: 352^{b}32

Ammonos: *Ath*. 61.7. Trireme kept in reserve at the Piraeus for state purposes.

Amphiaraus: 1389^{a}16, 1455^{a}27. Early Greek hero.

Amphipolis: 1303^{b}2, 1306^{a}2. City on the river Strymon in Macedonia.

Amphyctyons: F219, F222. Political and religious organization of cities.

Amphytaeans: 1319^{a}14. Inhabitants of Amphytis, a small city on the northeast coast of Pallene in Chalcidice.

Amyntas: 1311^{b}14. Son of Archelaus II of Macedon.

Amyntas the Little: 1311^{b}3. Otherwise unknown.

Anacharsis: 78^{b}30, 1176^{b}33. Largely legendary Scythian prince.

Anacreon: *Ath*. 18.1. Lyric poet from Teos (c. 575–c. 495 bc).

Anaxagoras of Clazomenae: 187^{a}22, 26, 189^{a}17, 203^{a}20, 205^{b}1, 213^{a}24, 250^{b}24, 252^{a}10, 256^{b}24, 265^{b}22, 270^{b}24, 294^{b}14, 301^{a}11, 302^{a}31, ^{b}14, 309^{a}19, 314^{a}13, 17, 25, 339^{b}22, 342^{b}27, 345^{a}25, 348^{b}12, 365^{a}17, 19, 369^{b}14, 404^{a}25, ^{b}1, 405^{a}13, 405^{b}19, 429^{a}19, ^{b}24, 470^{b}30, 33, 677^{a}5, 687^{a}8, 723^{a}7, 756^{b}16, 763^{b}31, 984^{a}11, ^{b}18, 985^{a}18, 988^{a}17, 28, 989^{a}30, 991^{a}16, 1007^{b}25, 1009^{a}27, ^{b}26, 1012^{a}26, 1056^{b}28, 1063^{b}25, 1069^{b}21, 1072^{a}5, 1075^{b}8, 1079^{b}20, 1091^{b}11, 1141^{b}3, 1179^{a}13, 1215^{b}6, 1216^{a}11, 1398^{b}15. Presocratic philosopher (c. 500–c. 428 bc).

Anaxandrides: 1152^{a}22, 1411^{a}18, 1412^{b}16, 1413^{b}25. 4th-cent bc comic poet from Camirus in Rhodes.

Anaxilaus: 1316^{a}38. Tyrant of Rhegium (494–476 bc).

Anaximander: 187^{a}21, 203^{b}14, 295^{b}12, 1069^{b}22. Presocratic philosopher from Miletus (died soon after 547 bc).

Anaximenes: 294^{b}13, 365^{a}18, ^{b}6, 984^{a}5. Presocratic philosopher from Miletus (fl. 546–525 bc).

Anchimolus: *Ath*. 19.5.

Androcles of Pitthus: 1400^{a}9. Prominent popular leader in Athens in the latter part of the 5th cent bc.

Androdamus of Rhegium: 1274^{b}23. Otherwise unknown.

Andromache: 1239^{a}36. In Antiphon's *Andromache*.

Andros, Andrians: 1270^{b}12. The northmost of Cyclades, about six miles southeast of Euboea.

Androtion: 1406^{b}27. Athenian politician (c. 410–340 bc), who studied under Isocrates.

Angra Mainyu (Areimanius): F19. Zoroastrian god.

Antandria: 519^{a}16. City in the Troad region of Anatolia.

Anthemion: *Ath*. 7.4. Perhaps the father of Anytus.

Antheus of Agathon: 1451^{b}21. Lost.

Antidosis of Isocrates: 1418^{b}28

Antidotus: *Ath*. 26.4

Antigone: 1373^{b}9, 1375^{a}34, 1417^{a}29, 1418^{b}32. Daughter of Oedipus.

Antigone of Sophocles: 1415^{b}19, 1417^{a}28, 1454^{a}1

Antileon: 1316^{a}32. Tyrant of Chalcis, but otherwise unknown.

Antilochus of Lemnos: F109. Purported rival of Socrates.

Antimachus: 1408^{a}1. Poet and scholar from Colophon (fl. 400 bc).

Antimenides: 1285^{a}36. Brother of Alcaeus.

Antipater: F233, F234, F235, F236, F237. Macedonian statesman and general.

Antipheron of Oreus: 451^{a}9. Otherwise unknown.

Antiphon: 1239^{a}37, 1379^{b}15, 1385^{a}9, 1399^{b}25. 4th-cent BC tragic poet from Syracuse.

Antiphon of Rhamnus: 172^{a}7, 185^{a}17, 193^{a}12, 1232^{b}8, *Ath*. 32.2. 5th-cent BC Athenian politician and orator.

Antiphon the Soothsayer: F109. Purported rival of Socrates, possibly Antiphon of Rhamnus.

Antissa, Antissaeans: 1303^{a}34. Aeolians from the north coast of Lesbos.

Antisthenes: 104^{b}21, 1024^{b}32, 1043^{b}24, 1284^{a}15, 1407^{a}9. Philosopher, follower of Socrates (445–365 BC).

Anytus: *Ath*. 27.5, 34.3. Late-5th-cent BC politician. An accuser of Socrates in 399 BC.

Aparctias Wind: 363^{b}14

Apeliotes Wind: 363^{b}13

Apelles: F103. 4th-cent BC painter.

Aphidna: *Ath*. 34.3

Aphrodite: 406^{b}19, 1149^{b}15, 1269^{b}29, 1400^{b}22, 1413^{a}34. The goddess of sexual love.

Apis: 1216^{a}1. Egyptian god.

Apollo: 1380^{b}28, 1398^{b}33, *Ath*. f1, 55.3, F15, F105. Greek god.

Apollodorus of Lemnos: 1259^{a}1. A contemporary of Aristotle's who wrote on practical farming.

Apollonia, Apolloniates: 511^{b}30, 1303^{a}36, 1306^{a}9. City on the Black Sea.

Apollonia: 511^{b}30, 1290^{b}11. City on the Ionian Gulf.

Arabia: 349^{a}5, 494^{b}8, 498^{b}9, 499^{a}15, 546^{b}3, 606^{b}5

Arachotae: 499^{a}4. Now Baluchistan.

Araxes River: 350^{a}24. Perhaps the Syr Darya.

Arcadia, Arcadians: 351^{a}3, 388^{b}6, 617^{a}14, 647^{a}14, 1261^{a}29, 1269^{b}4, 1270^{a}3, F211, F222. Highland region at the center of the Peloponnese.

Arcesius: F210. Greek hero and grandfather of Odysseus.

Archagoras: F96

Archelaus: 1311^{b}8, 30, 1398^{a}25. King of Macedon (c. 413–399 BC).

Archemorus: F222. Mythical son of Lycurgus.

Archestratus: *Ath*. 35.2. Identity unknown.

Archias: 1306^{b}1. Tyrant of Thebes c. 379 BC.

Archibius: 1376^{a}10. Otherwise unknown.

Archidamus: 1406^{b}30. Otherwise unknown.

Archilochus: 1328^{a}3, 1398^{b}12, 1418^{b}27. 7th-cent BC poet from the island of Paros.

Archinus: *Ath*. 17.4, 34.3, 40.1–2. Democratic leader.

Archytas of Tarentum: 1043^{a}21, 1340^{b}26, 1412^{a}12. Pythagorean mathematician and philosopher (fl. c. 400–350 BC).

Areopagus: 1138^{b}33, 1188^{b}33, 1273^{b}39, 1274^{a}7, 1304^{a}20, 1315^{b}22, 1354^{a}23, 1398^{b}26, *Ath*. 3.6, 4.4, 8.2, 8.4, 16.8, 23.1, 27.1, 35.2, 41.2, 47.2, 60.3. Prominent rock outcropping in Athens.

Ares: 1269^{b}28, 1407^{a}17, 1412^{b}35, 1413^{a}6, 1457^{b}21, 22, 33. The god of war.

Argestes Wind: 363^{b}24

Arginusae: *Ath*. 34.1. Site, near Lesbos, of a sea battle between the Athenians and Spartans in 406 BC.

Arginussa: 578^{b}27

Argonauts: 1284^{a}23, 24. Heroes who went in his quest of the Golden Fleece.

Argos, Argive, Argolid: 117^{a}27, 352^{a}9, 602^{a}8, 1269^{b}4, 1270^{a}2, 1302^{b}18, 1303^{a}6, 1304^{a}25, 1310^{b}27, 1365^{a}27, 1375^{a}5, 1452^{a}8, *Ath*. 17.3, 17.4, 19.4. Ancient city in the eastern Peloponnese.

Arimnestus: F243. Aristotle's brother.

Ariobarzanes: 1312^{a}16. Probably satrap of the Persian province of Pontus who led the Satrap's revolt c. 362 BC.

Ariphrades: 1458^{b}31, 1459^{a}3. Otherwise unknown.

Ariphron: *Ath*. 22.6. Pericles' father.

Aristaechmus: *Ath*. 4.1

Aristides: 1398^{a}10, 1414^{b}36, *Ath*. 22.7, 23.2, 23.4, 24.3, 28.2, 41.2. Athenian statesman (c. 520–c. 468 BC).

Aristion: *Ath*. 14.1. Identity uncertain.

Aristippus: 996^{a}32, 1398^{b}29. Associate of Socrates noted for his luxurious lifestyle.

Aristocrates: *Ath*. 33.2. Athenian politician and general.

Aristodicus of Tanagra: *Ath*. 25.4. Otherwise unknown.

Aristogeiton: *See* Harmodius

Aristomachus: *Ath*. 32.1

Aristomenes: 47^{b}22, F243. Member of the Lyceum.

Ariston of Ceos: F128. 3rd-cent BC peripatetic philosopher.

Aristophanes: 1362^{b}11, 1405^{b}30, 1448^{a}27. Athenian comic poet (?450–386 BC).

Aristophon: 1398^{a}5. Athenian statesman (431–404 BC).

Aristoxene: F216

Arrabaeus: 1311^{b}12. Possibly the king of the Lyncestians.

Artabanus: 1311^{b}37. Leader of Xerxes' bodyguard and killer of Darius.

Artapanes: 1311^{b}38. Killer of Xerxes.

Artemis: *Ath*. 58.1. Greek god.

Asclepius: *Ath*. 56.4. Mythical figure regarded as the first doctor.

Asia: 350^{a}18, 353^{a}9, 569^{a}19, 578^{b}27, 606^{b}16, 18, 1271^{b}36, 1285^{a}21, 1289^{b}40, 1327^{b}27, 1415^{a}17

Assyria: F65

Assyritis: 519^{a}15

Asteios: 343^{b}19

Aster: F222

Astyages: 1312^{a}12. Last king of the Medes (594–559 BC).

Astydamas: 1453^{b}33. Prolific and successful 4th-cent BC tragic poet.

Atarneus: 1267^{a}32, 35, F242. Stronghold on the coast of Asia Minor.

Athena: 1341^{b}3, 7, 1347^{a}15, 1363^{a}18, 1413^{a}34, *Ath*. 14.4, 30.2, F189, F222, F243. Patron goodness of Athens.

Athens, Athenians: 5^{b}23, 69^{a}1, 94^{a}37, 202^{b}13, 224^{b}22, 559^{a}12, 569^{b}11, 26, 577^{b}30, 618^{b}15, 1010^{b}11, 1124^{b}17, 1236^{a}38, 1242^{b}25, 1267^{b}18, 1268^{a}10, 1275^{b}35, 1284^{a}39, 1291^{b}24, 1300^{b}28,

1302b19, 1303a8, b10, 1304a6, 9, 28, 1305a26, b25, 1307b22, 23, 1310b30, 1315b30, 1319b21, 1322a20, 1341a33, 1367b8, 1375b30, 1384b33, 1396a8, 24, 1398b1, 16, 1411a9, 11, 1412b4, 1415b34, 1418a29, F63, F64, F96, F120, F226, F237, F239

Athos, Mount: 549b17, 607a12, 1410a11

Atlas: 284a20, 699a25, 699a30, 699b1, 1023a20, F65. Mythical carrier of the universe.

Attalus: 1311b3. *See* Periander, tyrant of Ambracia.

Attica: 1398a1, 1411a25, *Ath*. f1, 33.1

Ausones: 1329b20

Autocles: 1398b26. Athenian ambassador to Sparta in 371 BC.

Autophradates: 1267a32, 36. Satrap of Lydia.

Babylon, Babylonia, Babylonians: 282a8, 1265a14, 1276a28, 1284b1, 1352b26, F65

Babylonians: 1405b30. Play by Aristophanes.

Bacchiad Family: 1274a33. Leading oligarchic family in Corinth in the 6th cent BC.

Bactria: 498b8, 499a14. Region in Central Asia.

Bactrus River: 350a23. Perhaps the Amu Darya.

Basilids: 1305b19. Found at Ephesus, Erythrae, and perhaps at Chios.

Bear, the: 350b7, 362a16, 32, b34, 363a3, b15, 364a6, 377a15, b27. Ursa Major.

Bias of Priene: 1130a2, 1389b22, F15. One of the so-called Seven Sages (6th cent BC).

Bird Winds: 362a23

Bistonis, Lake: 598a23. On the Thracian coast near Abdera.

Black Sea: 350b4, 351a12, 354a14, 17, 543b3, 566b10, 567b16, 568a4, 571a15, 597a15, 598a24, 27, 30, b2, 10, 29, 571a15, 21, 601b17, 603a25, 604b22, 606a10, 682a28, 782b33, 1148b22, 1303a37, 1305b36, 1306a9, 1338b21, 1338b22

Boeotia(ns): 559a3, 605b31, 1407a3, F210

Bolbe, Lake: 507a17. Now Lake Volvi.

Boreas Wind: 362b35, 363b14, 698b25

Borysthenes River: 462b25, F121. Now the Dnieper.

Bosporus: 353a7, 372a15, 600a5

Bosporus, Cimmerian: 552b18

Bottiaea: F212

Brasidas: 1134b23. Distinguished Spartan general (d. 422 BC).

Brauronia: *Ath*. 54.7

Bryson: 75b40, 171b16, 172a4, 563a7, 615a10, 1405b9. Early-4th-cent BC sophist from Heraclea Pontica on the coast of Bithynia in Asia Minor.

Byzantium, Byzantines: 571a17, 598b10, 14, 599a2, 612b8, 1247a19, 1291b23, 1303a33. Present-day Istanbul.

Cadmus: F213. Greek hero.

Caecias, Wind: 363b17

Caeneus: 78a1. Probably a character in a comedy.

Callias: 1405^{a}20. One of the richest men in Greece and a patron of the sophists.

Callias: *Ath*. 32.1, 32.2

Callias of Angele: *Ath*. 34.1

Callibius: *Ath*. 37.2, 38.1

Callicles: 173^{a}8. Character in Plato's *Gorgias*.

Callicrates: *Ath*. 28.3

Calliope: 173^{b}30, 1405^{a}33. The muse of epic poetry.

Callippides: 1461^{b}35, 1462^{a}9. Tragic actor, active 427–400 BC.

Callippus: 1373^{a}19. Friend of Dion, later involved in his death.

Callippus: 1399^{a}16, 1400^{a}4. Athenian student of Isocrates.

Callippus of Cyzicus: 1073^{b}32. Astronomer (fl. c. 330 BC).

Callisthenes: 1380^{b}12. 4th-cent BC Athenian general active in the Hellespont.

Callistratus: 1364^{a}19, 1374^{b}26, 1418^{b}10. 4th-cent BC Athenian politician.

Calydon: 1409^{b}10, 12. City in Aetolia.

Calypso: 1109^{a}31. Nymph in the *Odyssey*.

Camicus: 1271^{b}40. Fortress town, near Acragas.

Canopus: 351^{b}33. Ancient Egyptian coastal town.

Carcinus: 1150^{b}10, 1400^{b}10, 1417^{b}18, 1454^{b}23, 1455^{a}26. 4th-cent BC Athenian tragic poet.

Caria: 518^{a}35, 547^{a}6, 548^{a}14, 607^{a}15, 631^{a}10, 11, 673^{a}17. Region in western Anatolia.

Carpathian: 1413^{a}16. Carpathus was an island between Crete and Rhodes.

Carthage, Carthaginians: 1272^{b}24, 29, 1273^{a}21, 28, ^{b}9, 25, 1275^{b}12, 1280^{a}36, 1293^{b}15, 1307^{a}5, 1316^{a}34, ^{b}5, 1320^{b}4, 1324^{b}13, 1344^{a}33, 1372^{b}28. City in present-day Tunisia, on the eastern shore of Lake Tunis.

Caspian Sea: 354^{a}3

Catana: 1274^{a}23. City in Sicily.

Caucasus: 350^{a}27, 351^{a}8

Cedripolis: 620^{a}33. Early-4th-cent BC king of part of Thrace.

Celtic Territory: 350^{b}2, 606^{b}4. Ancient Gaul.

Celts: 748^{a}25, 1115^{b}28, 1229^{b}30, 1269^{b}26, 1224^{b}12, 1336^{a}18, F65

Cephalonia: 605^{b}27, 1461^{b}6. Ionian island.

Cephalus: F214. Greek hero and ancestor of Odysseus.

Cephisodotus: 1407^{a}9, 1411^{a}5, 23, 28. Probably the orator referred to in Demosthenes, *Against Leptines* 146.

Cephisophon: *Ath*. 54.7

Cerbes River: 646^{b}38

Cercidas: 673^{a}22

Cercops: F21

Cercyon: 1150^{b}10

Ceryces: *Ath*. f2, 39.2, 57.1. Aristocratic Athenian family.

Chabrias: 1364^{a}21, 1411^{b}6. Athenian soldier (c. 420–357/6 BC).

Chaeremon: 1400b24, 1413b13. Mid-4th-cent BC tragic poet.

Chalcedon: 721b33, 1266a39. Now a district of Istanbul.

Chalcis, Chalcidian: 496b25, 519a14, 531b12, 677a3, 1274a24, 1289b39, 1303b2, 1304a29, 1306a3, 1316a31, F237, F243. Chief town in Euboea.

Chaldeans: F65. Probably astronomers from the ancient Near East.

Chamaeleon: F16. Peripatetic philosopher and literary critic (4th to 3rd cent BC).

Chaonia: 359a25. In Epirus, northwest Greece.

Chares: 1306a5, 1376a10, 1411a6, b3, 1418a31. Athenian general (c. 400–c. 325 BC).

Chares of Paros: 1258b40. Otherwise unknown.

Charicles: 1305b26. One of the Thirty Tyrants.

Charidemus: 1399b2. 4th-cent BC mercenary general in Oreus.

Charilaus: 1316a25. King of Sparta (c. 780–750 BC).

Charillus: 1271b25, 1316a34.

Charon the Carpenter: 1480b30. Apparently a character in Archilochus.

Charondas of Catana: 1252b14, 1274a23, 30, b5, 1297a23, 1352b13. Late-6th-cent BC legislator.

Charybdis: 356b13

Chilon: 1389b3, 1398b13, F15, F16, F17. Spartan sage (fl. 560–556 BC).

Chionides: 1448a34. Early comic poet in Athens (active from the 480s and 470s BC).

Chios, Chians: 343a1, 763b1, 1259a13, 1284a40, 1291b24, 1303a34, 1306b5, 1347b35, 1398b11, 1409b26, *Ath*. 24.2. Island near the Anatolian coast.

Chiron: 1230a3. Centaur wounded by Heracles' arrow.

Choaspes River: 350a24. Perhaps the Panjkora.

Choerilus: 157a16, 1415a4. Late-5th-cent BC epic poet from Samos.

Chonians: 1329b21

Choraxi: 351a11. On the east coast of the Black Sea.

Chremetes River: 350b14. Perhaps the Senegal River.

Chytrus: 1303b9. Site unknown.

Cimon: 1233b14, 1390b31, *Ath*. 26.1, 27.1, 27.3, 28.2. Athenian politician and general (470s BC).

Cinadon: 1306b34. Spartan who fomented a rebellion in the reign of Agesilaus II.

Cineas the Thessalian: *Ath*. 19.5.

Clazomenae: 984a11, b19, 1215b7, 1303b9. City on the Ionian Coast.

Cleander: 1316a37. Tyrant of Gela (assassinated in 498 BC).

Clearchus: F15. Peripatetic philosopher (4th to 3rd cent BC).

Cleidemus: 370a11

Cleisthenes: 1275b36, 1319b21, *Ath*. f2, 20.1–22.4, 28.2, 29.3, 41.2. Athenian statesman (570–c. 508 BC).

Cleisthenes: 1315b16, 18, 1316a31. Tyrant at Sicyon.

Cleitophon: *Ath*. 29.2, 34.3

Cleomenes: F17. Greek philologist.

Cleomenes I: 1303^{a}7, 1355^{b}1, *Ath*. 19.2, 19.5. King in Sparta c. 519–487 BC.

Cleon: 43^{a}26, 182^{a}32, 420^{b}4, 425^{a}26, 1040^{b}2, 1055^{b}35, 1378^{a}35, 1407^{a}26, 1408^{b}26, 1457^{a}28, *Ath*. 28.3. Athenian politician.

Cleontimus: 1306^{a}2

Cleopatra: 1311^{b}15

Cleophon: 174^{b}27. Character in the *Mandrobulus* of Xenocrates.

Cleophon: 1375^{b}32, *Ath*. 28.3, 34.1. Late-5th-cent BC democratic leader in Athens.

Cleophon: 1408^{a}14, 1448^{a}12, 1458^{a}20. Athenian tragic poet.

Cleotimus: 1306^{a}2

Clerachus: 1203^{a}23. Probably, the tyrant of Heraclea (c. 364/3–353/2 BC).

Clotho: 401^{b}22. One of the Fates.

Clytemnestra: 1453^{b}23. Wife of Agamemnon.

Cnidus: 569^{a}14, 1305^{b}12, 1306^{b}5. City on the coast of present-day Turkey.

Codrus: 1310^{b}37, *Ath*. f5, 3.3. Legendary early king of Athens.

Collytus: *Ath*. 14.4

Colophon: 1290^{b}15, 1303^{b}10. City in Ionia.

Comeas: *Ath*. 14.1

Conon: 1399^{a}5, 1400^{b}18. Athenian naval commander.

Conon: *Ath*. 25.2

Corax: 1402^{a}17, F163. 5th-cent BC teacher of rhetoric from Syracuse.

Coraxi: 351^{a}11

Corinth: 345^{a}5, 1265^{b}12, 1274^{a}32, 1280^{b}13, 1306^{a}24, 1310^{b}30, 1315^{b}23, 1363^{a}15, 16, 1375^{b}31, F93. City in the Peloponnese.

Coriscus of Scepsis: 85^{a}25, 166^{b}32, 173^{b}31, 173^{b}38, 175^{b}19, 176^{a}7, 178^{b}39, 179^{a}1, ^{b}2, 181^{a}10, 182^{a}20, 219^{b}21, 227^{b}32, 450^{b}31, 461^{b}23, 462^{a}5, 644^{a}25, 26, 31, 767^{b}25, 768^{a}1, 1015^{b}17, 1026^{b}18, 1037^{a}7, 1220^{a}19, 1240^{b}25. Platonist philosopher; often used as an example.

Cos: 551^{b}16, 1304^{b}26. Island in the Dodecanese chain.

Cotys: 1311^{b}21, 22. King of Thrace (assassinated in 359 BC).

Crantor of Soli: F17. Member of Plato's Academy (4th and 3rd cent BC).

Crataeas: 1311^{b}8. Killer of Achelaus II of Macedon.

Crates: 1449^{b}6. 5th-cent BC comic poet.

Crates of Thebes: F81. Cynic philosopher (c. 365–285 BC).

Cratylus: 987^{a}32, 1010^{a}12, 1417^{b}1. Heraclitean philosopher.

Creon: 1375^{a}34, 1454^{a}1. Brother of Jocasta.

Cresphontes: 1454^{a}5

Crete: 572^{a}14, 598^{a}16, 612^{a}3, 1102^{a}10, 1229^{a}25, 1252^{b}15, 1263^{b}41, 1264^{a}20, 1269^{a}29, 39, 1271^{a}29, ^{b}20, 23, 27, 40, 1272^{a}1, 3, 5, 8, 9, 13, 27, 16, ^{b}20, 28, 1273^{b}25, 1274^{a}27, 1324^{b}8, 1329^{b}3, 5, 6, 1418^{a}24, 1461^{a}14, F90, F212. Island in the southern part of the Aegean.

Creusa: *Ath*. f1

Critias: 405^{b}6, 1375^{b}32, 34, 1416^{b}28. Leader of the Thirty Tyrants.

Croesus: 1407^{a}38. King of Lydia (c. 560–546 BC).

Cronos: *Ath*. 16.7, F183. Father of Zeus.

Croton: 581^{a}16, 752^{b}25, 986^{a}26, F175, F176. City in southern Italy.

Crown, the: 360^{b}10. Corona Borealis.

Ctesias of Cnidos: 501^{a}25, 523^{a}26, 606^{a}8, 736^{a}2. Late-5th-cent BC Greek physician and historian.

Cyclops: 1180^{a}27, 1380^{b}24, 1448^{a}15, F166. One-eyed giant in the *Odyssey*.

Cycnus: 1396^{b}17. Son of the sea god Poseidon.

Cydias: 1384^{b}32. Athenian orator. Otherwise unknown.

Cyllene, Mount: 617^{a}14

Cylon: *Ath*. f6. An Olympic victor married to the daughter of Theagenes.

Cyme: 1269^{a}2, 1305^{a}1. Possibly Aeolian Cyme, Euboean Cyme, or Italian Cyme.

Cypria: 1459^{b}2, 4

Cypriots: 1455^{a}1. Of Dicaeogenes.

Cyprus: 298^{a}3, 511^{b}24, 552^{b}10, 1311^{b}4, 1457^{b}6, F67, F81. Large island in the eastern Mediterranean.

Cypselus, Cypselids: 1310^{b}29, 1313^{b}22, 1315^{b}24, 27, *Ath*. 17.4. Tyrant(s) of Corinth.

Cyrenaic School: F89

Cyrene: 556^{a}22, ^{b}2, 557^{a}29, 606^{a}6, 607^{a}2, 1319^{b}16. Greek colony on the Libyan coast of Africa, founded from Thera in c. 630 BC.

Cyrus: 1310^{b}38, 1312^{a}12. First ruler of the Persian empire (559–529 BC).

Daedalus: 406^{b}18, 1253^{b}35. Legendary craftsman and inventor.

Damasias: *Ath*. 13.2

Damonides: *Ath*. 27.4

Danaus: 1452^{a}28, F222

Daphnaeus: 1305^{a}26. General in Syracuse.

Darius: 352^{b}28, 1212^{a}5, 6, 1311^{b}38, 1393^{a}33. King of Persia (521–486 BC).

Daughters of Phorcys: 1456^{a}1

Decamnichus: 1311^{b}30. Leader of a revolt against Archelaus. Otherwise of uncertain identity.

Decelea: *Ath*. 34.1. Near Parnes.

Deer Mountain: 578^{b}27

Deiliad: 1448^{a}13. Of Nicochares.

Deinon of Colophon: F66. 4th-cent BC historian.

Delos: 580^{a}18, 1099^{a}25, 1214^{a}1, *Ath*. 54.7, 56.3, 62.2. Island near Mykonos.

Delphi: 1303^{b}37, 1398^{b}32, *Ath*. 19.4, F13, F236. City on the southwestern spur of Mt. Parnassus.

Delphic Oracle: *Ath*. 21.5

Delphinium: *Ath*. 57.3. South of the temple of Olympian Zeus.

Demades: 1401^{b}32. Athenian politician and orator (c. 380–319 BC).

Demaretus: *Ath*. 38.2. Otherwise unknown.

Demeter: F222, F243. Goddess of the harvest.

Democritus: 1407^{a}7. Identity uncertain.

Democritus of Abdera: 184^{b}21, 188^{a}22, 194^{a}20, 203^{a}20, 33, 213^{a}34, 251^{b}16, 252^{a}34, 275^{b}30, 294^{b}14, 300^{b}8, 303^{a}4, 305^{a}34, 307^{a}17, 313^{a}21, 314^{a}18, 21,

315[a]35, [b]6, 29, 316[a]1, 323[b]10, 325[a]1, 326[a]9, 327[a]19, 342[b]27, 343[b]25, 345[a]25, 356[b]10, 365[a]18, [b]1, 403[b]31, 404[a]27, 405[a]8, 406[b]17, 20, 409[a]12, 32, [b]8, 419[a]15, 438[a]5, 442[a]29, [b]10, 464[a]5, 11, 470[b]28, 471[b]30, 482[a]30, 623[a]32, 640[b]31, 642[a]26, 665[a]30, 740[a]13, 36, 742[b]20, 747[a]26, 29, 764[a]6, 20, [b]14, 765[a]6, 769[a]17, [b]30, 788[b]10, 789[b]2, 985[b]4, 1009[a]27, [b]11, 15, 1039[a]9, 1042[b]11, 1069[b]22, 1078[b]20, F194. Atomist philosopher (c. 460–c. 360 BC).

Democritus of Chios: 1409[b]27. Well-known musician.

Demodocus: 1151[a]8. 6th-cent BC poet from the island of Leros near Miletus.

Demosthenes: 1401[b]33. Athenian orator (384–322 BC).

Demosthenes: 1397[b]7, 1407[a]5. Probably not the famous orator. Otherwise unknown.

Departure of the Ships: 1459[b]7

Derdas: 1311[b]4. Otherwise unknown.

Deucalion: 352[a]32. Son of Prometheus, associated with the myth of the great flood.

Dexander: 1304[a]9. Citizen of Mytilene. Otherwise unknown.

Diagoras: 1306[a]36. Mentioned in connection with the overthrow of an oligarchy in Eretria. Otherwise unknown.

Diares: 418[a]21. Example.

Dicaearchus: F221. Student of Aristotle.

Dicaeogenes: 1455[a]1. A tragic and dithyrambic poet, probably of the 4th cent BC.

Didymus: F17

Diocles: 1274[a]33. Olympic victor.

Diogenes of Apollonia: 322[b]13, 405[a]21, 470[b]31, 471[a]2, 511[b]30, 512[b]12, 984[a]5. 5th-cent BC Presocratic philosopher.

Diogenes the Cynic: 1411[a]24. Philosopher (c. 412/403–c. 324/321 BC).

Diomedes: 1116[a]22, 1136[b]10, 1396[b]15, 1416[b]12. Greek hero at Troy.

Diomedon: 1397[a]26. Otherwise unknown.

Dion of Alexandria: F133. 1st-cent BC Platonist philosopher.

Dion of Syracuse: 1312[a]4, 34, [b]16, 1344[b]35, 1373[a]20. Killer of Dionysius II.

Dionysiac Contests: 1023[b]10, 1323[a]2, 1416[a]32, F90. Athletic, musical, and dramatic competitions that were held throughout the year in many Greek cities.

Dionysius: 1448[a]6. Painter. Otherwise unknown.

Dionysius I: 1259[a]28, 1286[b]39, 1305[a]26, 1306[a]1, 1310[b]30, 1313[b]27, 1344[b]36, 1357[b]31, 34, 1385[a]10, 1390[b]29, 1401[b]13. Ruling tyrant of Syracuse (430–367 BC).

Dionysius II: 1307[a]39, 1312[a]4, 35, [b]11, 16. Ruling tyrant of Syracuse (c. 367–357, 346–344 BC), son of Dionysius I by his wife Doris.

Dionysius the Brazen: 1405[a]32. Early-5th-cent BC poet and rhetorician.

Dionysius the Sophist: 148[a]27. Otherwise little-known.

Dionysus: 1023[b]11, 1323[a]2, 1407[a]16, 1416[a]32, 1457[b]21, 22, *Ath*. 3.5, 54.8, 56.3, 56.5, 57.1. Greek god.

Diopeithes: 1386^{a}14. Probably the Athenian general, who led Athenian settlers to the Chersonese in c. 343 BC.

Diophantus: 1267^{b}18. Otherwise unknown.

Dioscuri: 1245^{b}34. Castor and Pollux.

Dioteles: F243. Member of the Lyceum.

Diphilus: *Ath*. 7.4. Identity uncertain.

Dodona: 352^{a}35. In Epirus in northwestern Greece; site of an ancient oracle of Zeus.

Dodonis: 1398^{b}3

Dolon: 1461^{a}12

Dorian Mode: 1276^{b}9, 1290^{a}22, 1342^{b}16

Dorians: 1448^{a}30

Dorieus: 1357^{a}19. The son of Diagoras of Rhodes.

Draco: 1274^{b}15, 1400^{b}21, 22, *Ath*. 3.1, 4.1, 7.1, 41.2. Draco set up laws for Athens in 621 BC, notorious for their harshness.

Dracontides: *Ath*. 34.3. A member of the Thirty Tyrants.

Druids: F65

Ecphantides: 1341^{a}36. Early Old-Style comic poet.

Eëtionia: *Ath*. 37.1. On the north side of Piraeus.

Egypt, Egyptians: 274^{b}16, 292^{a}8, 298^{a}3, 343^{b}10, 31, 351^{b}28, 352^{b}21, 500^{a}4, 502^{a}9, 503^{a}1, 557^{a}30, 559^{b}1, 562^{b}25, 581^{a}1, 584^{b}7, 31, 597^{a}6, 602^{a}21, 608^{b}33, 606^{a}21, 612^{a}16, 617^{b}27, 29, 30, 770^{a}35, 981^{b}23, 1216^{a}1, 1235^{b}3, 1286^{a}13, 1313^{b}2, 3, 24, 32, 1329^{b}32, 1393^{a}32, 33, 1417^{a}6, *Ath*. 11.1, F19

Elea: 1400^{b}6. City (now Velia) in southwest Italy on the Tyrrhenian Sea.

Electra of Sophocles: 1460^{a}31

Eleusinia: F37, F222

Eleusis: *Ath*. 39.1–5, 54.7, 57.1. On the Saronic Gulf; site of the Eleusinian mysteries.

Eleven, the: 1322^{a}20, *Ath*. 39.5, 52. Officials in charge of the custody and execution of prisoners in Athens.

Elimeia: 1311^{b}13. City in central Greece, south of Macedon.

Elis: 586^{a}3, 722^{a}9, 1306^{a}16, 1416^{a}1. City in the northwestern Peloponnese.

Empedocles: 105^{b}16, 127^{a}18, 187^{a}22, 188^{a}18, 189^{a}15, 194^{a}20, 196^{a}20, 198^{b}32, 250^{a}26, 252^{a}7, 279^{b}15, 280^{a}16, 284^{a}26, 294^{a}25, 295^{a}8, 30, 300^{b}2, 29, 301^{a}16, 302^{a}29, ^{b}23, 305^{a}34, ^{b}1, 314^{a}16, 25, ^{b}7, 20, 315^{a}3, 324^{b}33, 325^{b}1, 5, 16, 19, 326^{b}6, 329^{a}3, ^{b}1, 330^{b}20, 333^{a}18, 35, 357^{a}26, 369^{b}12, 381^{b}32, 387^{b}4, 404^{b}11, 408^{a}19, 410^{a}3, 28, 415^{b}28, 418^{b}20, 427^{a}22, 430^{a}28, 432^{b}11, 437^{b}11, 23, 441^{a}7, 10, 446^{a}26, 473^{a}15, 477^{a}32, 482^{a}29, 484^{a}38, 485^{b}26, 640^{a}18, 642^{a}18, 648^{a}31, 722^{b}8, 19, 723^{a}24, 731^{a}4, 747^{a}26, 34, 764^{a}2, 12, 18, 765^{a}6, 9, 764^{b}17, 769^{a}17, 777^{a}8, 779^{b}16, 984^{a}8, 985^{a}2, 985^{a}21, 29, 988^{a}16, 27, 989^{a}20, 993^{a}17, 996^{a}8, 998^{a}30, 1000^{a}25, 1001^{a}12, 1014^{b}37, 1069^{b}21, 1072^{a}6, 1075^{b}2, 1091^{b}11, 1147^{a}20, ^{b}12, 1155^{b}7, 1208^{b}12, 1212^{a}16, 1373^{b}14, 1407^{a}35, 1447^{b}18, 1457^{b}24, 1461^{a}24, F94, F95, F105. 5th-cent BC Presocratic philosopher.

Endymion: 1178^{b}20. Made immortal by Selene, but cast into a deep sleep.

Enyalius: *Ath*. 58.1. A Greek god, possibly Ares.

Ephesus: 371[a]31, 1201[b]8. City in Ionia.

Ephialtes: 1274[a]8, *Ath*. 25, 26.2, 28.2, 35.2, 41.2. Democratic leader in Athens (assassinated in 462/1 BC).

Ephorus: F213. Greek historian (c. 400–330 BC).

Epicharmus: 724[a]28, 1010[a]6, 1086[a]17, 1167[b]25, 1365[a]16, 1410[b]3, 1448[a]33. Late-6th-, early-5th-cent BC writer of comedies from Syracuse.

Epicurus: F45, F92, F133

Epidamnus: 1267[b]18, 1287[a]7, 1301[b]21, 1304[a]13. Adriatic colony of Corinth and Corcyra founded in the 7th cent BC.

Epidaurus: 1411[a]11. City on the Argolid peninsula.

Epilycus: *Ath*. 3.5

Epimenides the Cretan: 1252[b]14, 1418[a]23, *Ath*. 1.1. Religious teacher of the late 6th and early 5th cents BC.

Epirus: 522[b]16, 20, 572[b]19, 595[b]17, 606[b]4. Area in northwest Greece.

Equals, the: 1271[a]26. Spartan citizens, born of citizen parents, who possessed sufficient wealth to participate in the communal messes.

Erechtheus: *Ath*. f1. Legendary king of Athens.

Eresus: F228. City on Lesbos.

Eretria, Eretrians: 94[b]1, 1289[b]39, 1306[a]35, *Ath*. 15.2, 33.1. City on the island of Euboea.

Ergophilus: 1380[b]12. Athenian general active in the Hellespont in 363/2 BC.

Eriphyle: 1453[b]24

Erytheia: 359[a]28. One of the Hesperides.

Erythrae: 1305[b]19. Ionian city on the coast of Asia Minor.

Eryxis: 1231[a]17

Eteobutadae: *Ath*. f2. Aristocratic Athenian family.

Etesian Winds: 361[b]24, 35, 362[a]12, 23, 24, 30, 363[a]15. North winds.

Ethiopia, Ethiopians: 167[a]11, 349[a]5, 362[b]21, 490[a]11, 517[a]18, 523[a]18, 573[b]28, 586[a]3, 4, 722[a]10, 736[a]11, 782[b]35, 1290[b]5, F201

Ethiopian Mountains: 350[b]11

Etna: 400[a]34. Volcano on Sicily.

Etruscans: 1280[a]36

Euathlus: F96

Euboea: 366[a]27, 496[b]25, 677[a]3, 1411[a]10, *Ath*. 33.1. Large island off the coast of Boeotia.

Eubulus: 1267[a]31, 1376[a]9. Tyrant of Atarneus (c. 405–c. 335 BC).

Euclees: 343[b]4

Eucleides: *Ath*. 39.1

Eucleides the Elder: 1458[b]7. Otherwise unknown.

Euctemon: 1374[b]36.

Eudemus of Cyprus: F67, F241. Philosopher, politician, and friend of Aristotle.

Eudoxus of Cnidus: 991[a]17, 1073[b]17, 1079[b]21, 1101[b]27, 1172[b]9. Mathematician, astronomer, and philosopher (c. 390–c. 340 BC).

Eumathes: 1203[b]23. Otherwise unknown.

Eumelides: *Ath*. 45.1. Otherwise unknown.

Eumolpidae: *Ath*. f2, 39.2, 57.1. Aristocratic Athenian family.

Eunicus: 1238^{b}38. Poet of the Old Comedy.

Euripides: 443^{b}30, 1110^{a}28, 1136^{a}11, 1142^{a}2, 1155^{b}2, 1167^{a}33, 1169^{b}7, 1209^{b}35, 1210^{a}13, 1244^{a}10, 1252^{b}8, 1277^{a}19, 1310^{a}34, 1311^{b}33, 1328^{a}15, 1339^{a}19, 1370^{b}3, 1371^{a}28, 1371^{b}32, 1384^{b}16, 1394^{a}29, ^{b}16, 1395^{b}29, 1397^{a}18, 1400^{b}22, 1404^{b}25, 1405^{a}29, 1407^{b}34, 1411^{b}29, 1415^{a}19, 1415^{b}21, 1416^{a}30, 1418^{b}21, F96, F108, F127. Tragic poet (480s–407/6 bc).

Euripus: 366^{a}23, 547^{a}6, 763^{b}2. Narrow tidal strait between Euboea and Boeotia. Used as a simile for psychological turbulence (456^{b}17–28, 1167^{b}6–7).

Euronoti Winds: 363^{b}22

Europe: 224^{b}21, 579^{b}6, 606^{b}14, 15, 16, 18, 1285^{a}21, 1327^{b}24, 1415^{a}17

Euryphon: 1267^{b}22. Father of Hippodamus.

Eurypylus: 1459^{b}6

Eurystheus: 1245^{b}32. Imposed the famous labors on Heracles.

Eurytion of Heraclea: 1306^{a}39

Eurytus: 1092^{a}10. Early-4th-cent bc disciple of Philolaus of Croton.

Euthycrates: 1304^{a}12

Euthydemus: 177^{b}12, 1401^{a}27. Sophist from the island of Chios; contemporary of Socrates.

Euthynous: 1392^{b}12. Reference uncertain.

Euxenus: 1406^{b}30. Otherwise unknown.

Euxenus of Phocaea: F216

Evagoras: 1311^{b}5, 1399^{a}4, 6. King of Salamis in Cyprus (411–374 bc).

Evenus [of Paros]: 1015^{a}29, 1152^{a}31, 1223^{a}31, 1370^{a}11. Poet and orator (5th cent bc).

Favorinus: F14, F106. 1st- and 2nd-cent ad philosopher.

Figland: 507^{a}17

Florus: F91, F140. Unknown Roman.

Four Hundred: 1304^{b}12, 1305^{b}27, 1419^{a}28, *Ath*. 29.1, 31.3–34.1, 37.1. Oligarchy in Athens in 411 bc.

Gaul: F65

Gela: 1316^{a}27. City on the south coast of Sicily.

Gelon: 1302^{b}32, 1312^{b}10, 11, 12, 1315^{b}34, 36, 1316^{a}33, 1373^{a}22. Tyrant of Syracuse 485–478 bc.

Geraestus: *Ath*. 22.8

Glaucon of Teos: 1403^{b}26, 1461^{b}1. Rhapsode.

Glaucus: 1136^{b}10, 1236^{a}37. Homeric hero.

Gorgias of Leontini: 183^{b}37, 1260^{a}28, 1275^{b}26, 1404^{a}26, 1405^{b}37, 1406^{b}8, 15, 1408^{b}20, 1414^{b}31, 1416^{a}1, 1418^{a}34, 1419^{b}3, F159, F163. Orator and sophist (c. 483–376 bc).

Gorgilus: *Ath*. 17.4

Gorgus: 1315^{b}26. Half-brother of Periander.

Graces: 1133^{a}3, F4, F5, F228. Goddesses of beauty and creativity.

Graeci: 352^{b}2

Great Goddess: 1401a18. Cybele, the mother goddess.

Greece, Greeks: 152a13, 182a34, 270b8, 351a7, 352a9, 33, 584b11, 606a22, 1252b8, 20, 1255a29, 1271b33, 34, 1285a30, 1295a13, 1296a33, 1297b16, 1327b22, 29, 34, 1333b5, 1384b34, 1396a18, 1397b26, 1401a10, 1411a5, 27, 33, b30, 1414b32, 1460a16, *Ath*. 23.2, F8, F30, F136, F208, F213, F242.

Gryllion: F243. A sculptor.

Grylus: F97, 98. Warrior and son of Xenophon (d. 362 bc).

Gyges: King of Lydia (c. 680–645 bc).

Hades: F19, F90, F164, F182, F235, F242

Haemon: 1417b20, 1418b32, 1454a2. Son of Creon.

Halys: 1407a39. The longest river in Turkey.

Hanno: 1307a5. Leading figure in Carthage in the middle third of the 4th cent bc.

Harmodius and Aristogeiton: 1311a38, 1312b31, 1368a18, 21, 1397b28, 1398a18, 1401b11, *Ath*. 18.2–6, 58.1. Killers of Hipparchus (514 bc).

Harpactides: *Ath*. 19.5

Hebrus River: 350b17

Hector: 404a30, 1009b28, 1116a22, 33, 1145a20, 1191a8, 1230a20, 1380b27, 1396b17, 1397b22, 1460a15, b27, F29, F165. Greatest of the Trojan heroes.

Hecuba: 1400b22. Queen of Troy.

Hegemon of Thasos: 1448a12. Late-5th-cent bc author of burlesques.

Hegesias: *Ath*. 14.3

Hegesistratus: *Ath*. 17.3, 17.4.

Helen of Isocrates: 1414b27

Helen of Theodectes: 1255a36

Helen of Troy: 1109b9, 1363a18, 1399a2, 141b36, 1414b28

Helios: F79, F164. Titan and personification of the sun.

Hellanocrates of Larissa: 1311b17

Hellas, Hellenes: 352a34, b3

Hellen: 1024a33. Eponymous ancestor of the Hellenes (Greeks).

Hellespont: 366a27, 548b24, 549b15, 568a5, 1410a11

Hellespontias, Wind: 364b19

Heniochi: 1338b22. Believed to be an offshoot of the Spartans.

Hephaestus: 369a32, 1253b36, *Ath*. 54.7. Armorer and blacksmith to the gods.

Hera: 580a19, 1418b22. Wife of Zeus.

Heraclea: 367a1, 757a4, 1227b14, 1304b31, 1305b5, 11, 36, 1306a37, 39, *Ath*. 54.7. City on the Black Sea founded by Megara c. 560 bc.

Heracleid: 1451a20

Heracleides of Aenus: 1311b21. Co-killer of Cotys. Otherwise of uncertain identity.

Heracleides of Clazomenae: *Ath*. 41.3

Heracleodorus: 1303a19. 4th-cent bc democratic leader in Oreus.

Heracleotic: 525b5, 527b12, 684a8, 10

Heracles: 359a28, 585a14, b22, 1058a24, 1213a13, 1245a30, b30, 1284a23, 1451a22, F198, F222, F242. Greek hero.

Heraclides of Pontus: F59. 4th-cent bc Platonist philosopher.

Heraclitus of Ephesus: 104^{b}22, 159^{b}31, 185^{a}7, ^{b}20, 205^{a}3, 279^{b}15, 298^{b}30, 355^{a}14, 405^{a}25, 645^{a}17, 984^{a}7, 987^{a}33, 1005^{b}25, 1010^{a}13, 1012^{a}24, 34, 1062^{a}32, 1063^{b}24, 1078^{b}14, 1105^{a}8, 1146^{b}30, 1155^{b}4, 1176^{a}6, 1201^{b}8, 1223^{b}22, 1235^{a}25, 1315^{a}30, 1407^{b}14. Presocratic philosopher (fl. c. 500 BC).

Heraea: 1303^{a}15. City in western Arcadia in the Peloponnese.

Hercynian Mountains: 350^{b}5. The central massive from the Alps to the Carpathian mountains.

Hermes: 190^{b}7, 1002^{a}22, 1017^{b}7, 1048^{a}33, 1050^{a}20, 1116^{b}18, 1401^{a}20, 21. Messenger of the gods and god of good luck.

Hermias: F223, F233. Greek tyrant and friend of Aristotle.

Hermocreon: *Ath.* 22.2

Hermotimus of Clazomenae: 984^{b}19. A somewhat legendary figure.

Herodicus: 1243^{b}22, 1361^{b}5, 1400^{b}19. Physical trainer.

Herodorus of Heraclea: 563^{a}7, 615^{a}9, 659^{a}20, 757^{a}5. Father of Bryson; author of mythological works.

Herodotus of Halicarnassus: 523^{a}17, 736^{a}10, 756^{b}6, 1236^{b}9, 1407^{a}39, 1409^{a}28, 1417^{a}7, 1451^{b}2, *Ath.* 14.4, F213. Historian (484–425 BC).

Herpyllis: F243

Hesiod: 208^{b}30, 298^{b}28, 601^{b}1, 984^{b}23, 989^{a}10, 1000^{a}9, 1095^{b}9, 1132^{b}27, 1153^{b}27, 1164^{a}27, 1252^{b}10, 1312^{b}4, 1381^{b}17, 1388^{a}17. One of the oldest known Greek poets (c. 700 BC).

Hesione: 1416^{b}2. Sister of Priam.

Hestia: 369^{a}32. Goddess of the hearth.

Hestiaea: *See* Oreus

Hestiaeus: F59. 4th-cent BC Platonist philosopher.

Hiera: 367^{a}2. Island off the northern coast of Sicily.

Hiero: 1312^{b}11, 1313^{b}14, 1315^{b}34, 37, 1391^{a}9. Brother and successor of Gelon.

Hieronymus: F105, F133. Probably the 3rd-cent BC Peripatetic philosopher.

Himera: 1393^{b}10. City in Sicily.

Hipparchus: 1401^{b}12, *Ath.* 17.3, 18.3, 19.2. Younger son of Pisistratus, killed by Harmodius and Aristogeiton.

Hipparchus: F243. Member of the Lyceum.

Hipparchus Son of Charmus: *Ath.* 22.4. Probably Charmus was married to a daughter of Hippias.

Hipparinus: 1306^{a}1. Syracusan general whose daughter Aristomache was married to Dionysius I.

Hippasus of Metapontium: 984^{a}7. Early Pythagorean.

Hippias: 1356^{b}34, *Ath.* 17.3, 18–19. Tyrant of Athens, son of Pisistratus, brother of Hipparchus.

Hippias of Thasos: 1461^{a}22. Grammarian. Perhaps the man of that name who died in Athens in 404 BC.

Hippo: 405^{b}4, 984^{a}3. Eclectic philosopher (c. 495–428 BC).

Hippocentaur: F174

Hippocrates of Cos: 1326^{a}15. Famous 5th-cent BC doctor.

Hippocrates of Chios: 171^{b}15, 342^{b}36, 344^{b}15, 1247^{a}17. 5th-cent BC mathematician, anticipator of Euclid.

Hippodamus of Miletus: 1267^{b}22, 1268^{a}15, 1330^{b}24

Hippolochus: 1368^{a}17. Otherwise unknown.

Hippomenes: *Ath.* f5

Homer: 157^{a}15, 166^{b}3, 171^{a}10, 222^{a}1, 23, 351^{b}35, 404^{a}29, 427^{a}25, 513^{b}26, 519^{a}19, 574^{b}33, 575^{b}4, 578^{b}1, 606^{a}19, 615^{b}9, 618^{b}25, 629^{b}22, 673^{a}15, 679^{b}34, 699^{b}35, 785^{a}15, 1009^{b}28, 1076^{a}4, 1109^{a}31, ^{b}10, 1113^{a}8, 1116^{a}21, ^{b}27, 1118^{b}11, 1136^{b}9, 1141^{a}14, 1145^{a}20, 1149^{b}17, 1160^{b}26, 1161^{a}14, 1180^{a}28, 1191^{a}8, 1230^{a}20, 1234^{a}2, 1252^{b}22, 1253^{a}5, ^{b}36, 1259^{b}13, 1267^{a}1, 1278^{a}37, 1285^{a}10, 1287^{b}14, 1292^{a}13, 1338^{a}24, 1362^{b}35, 1363^{a}6, 19, 1365^{a}11, 30, 1370^{b}5, 11, 28, 1375^{b}30, 1378^{b}5, 33, 1379^{a}4, 1380^{b}23, 29, 1387^{a}34, 1395^{a}13, 15, 1398^{b}12, 1406^{b}21, 1410^{a}29, 1411^{b}31, 1412^{a}2, 7, 1413^{a}31, 1414^{a}2, 1415^{a}16, ^{b}26, 1417^{b}4, 1418^{a}8, 1447^{b}18, 1448^{a}11, 22, ^{b}28, 34, 1451^{a}23, 1459^{a}31, ^{b}12, 1460^{a}5, 19, F29, F99, F100, F105, F110, F135, F164

Homer Scholars: 1093^{a}27

Human: Boxing champion in the Olympic Games of 456 BC.

Hygiaenon: 1416^{a}29. Otherwise unknown.

Hymettus, Mount: *Ath.* 16.6. Near Athens.

Hypanis River: 552^{b}18

Hyperboreans: 580^{a}18

Hypsichides: *Ath.* 22.8

Hyrcanian Sea (Atlantic): 354^{a}3

Iapygia: 1303^{a}5, 1329^{b}20. The heel of the Italian peninsula.

Iberia, Iberians: 748^{a}26, 1224^{b}19

Icadius: 1461^{b}8

Icarius: 1461^{b}8

Ida, Mount: 1401^{b}22, F30

Idreus: 1406^{b}28. *See* Androtion

Iliad: 1030^{a}9, ^{b}9, 1045^{a}13

Illyria, Illyrians: 499^{b}12, 606^{b}3, 1461^{a}4. Region in the Balkan Peninsula.

Imbros: *Ath.* 62.2. Island in the north-northeastern Aegean; now part of Turkey.

Inachus River: 350^{b}16. In Argos.

India(n): 116^{a}38, 167^{a}8, 298^{a}12, 362^{b}21, 28, 499^{b}18, 501^{a}26, 571^{b}33, 597^{b}28, 606^{a}8, 607^{a}4, 34, 610^{a}19, 643^{b}6, 663^{a}19, 23, 746^{a}34, 1189^{a}20, 1226^{a}31, 1332^{b}24, F65

Indus River: 350^{a}26

Iolcus: F222. City in Thessaly.

Ion: 1024^{a}34, *Ath.* f1, 3.2. Legendary Athenian polemarch.

Ionia(n): 1024^{a}33, 1290^{b}11, 1329^{b}20, 1310^{b}28

Iophon: *Ath.* 17.3

Iphiades: 1306^{a}31. Otherwise unknown.

Iphicles: 585^{a}14. Fathered by Amphitryon one night earlier than his twin half-brother Heracles, who was fathered by Zeus.

Iphicrates: 1365^{a}28, 1367^{b}18, 1394^{a}23, 1397^{b}30, 1398^{a}5, 8, 17, 1399^{a}33, 1405^{a}20, 1411^{a}10, 1416^{a}10. Distinguished Athenian general (c. 415–353 BC).

Iphigenia: 1452^{b}6, 1454^{a}32, Daughter of Agamemnon and Clytemnestra.

Iphigenia in Aulis of Euripides: 1454^{a}7, 32, ^{b}32, 1455^{a}7, 18, ^{b}3

Isagoras: *Ath*. 20.1, 21.1, 28.2

Isles of the Blessed: 1334^{a}31, F90. Paradise where good people lived in eternal happiness.

Ismenias and Stilbon: 1398^{b}2. Theban citizens active in political life.

Isocrates: 1368^{a}20, 1392^{b}11, 1399^{a}2, 4, ^{b}10, 1408^{b}15, 1409^{b}33, 1410^{a}1, ^{b}29, 1411^{a}30, ^{b}28, 1412^{b}5, 1414^{b}27, 33, 1418^{a}33, ^{b}27. Athenian orator and educator (436–338 BC).

Ister: 350^{b}2, 356^{a}28, 597^{a}11, 598^{b}16. Now the Danube.

Isthmian Games: 1406^{a}21, 22, F222

Isthmus: F14. City on the island of Cos.

Istrus: 1305^{b}5, 11. City on the Black Sea.

Italus: 1329^{b}8, 10, 14

Italy, Italians: 367^{a}7, 607^{a}26, 632^{b}25, 987^{a}10, 31, 988^{a}26, 1274^{a}24, 1329^{b}7, 11

Ithaca: 606^{a}2, F214. Island in the Ionian Sea; now Corfu.

Ixion: 284^{a}35, 1456^{a}1. Thessalian king condemned to eternal punishment on a fiery wheel.

Jason the Thessalian: 1277^{a}24, 1373^{a}26, 1400^{b}13. Tyrant (c. 380–370 BC).

Jocasta: 1417^{b}18. Wife of Oedipus.

Jupiter: 343^{b}30, 1073^{b}35, 1074^{a}7

Kouretes: F210. Legendary tribe in Acarnania.

Kylon: F109. Purported rival of Pythagoras.

Laconia: 574^{a}17, 608^{a}27, 781^{b}10. Region in the southeastern part of the Peloponnese.

Laius: 1460^{a}30. Father of Oedipus.

Lametius: 1329^{b}13

Lampetia: F164. Daughter of Helios and personification of light.

Lampon: 1419^{a}2. Prophet mentioned in Aristophanes.

Lampsacus: 1398^{b}15. City on the eastern side of the Hellespont.

Larissa: 1275^{b}29, 1305^{b}19, 1306^{a}29, 1311^{b}17. Principal city of Thessaly.

Law: 1398^{b}6. Speech of Theodectes.

Lebadia: 606^{a}1

Lectum: 547^{a}5. Now Cape Baba; the westernmost point of Asia Minor.

Leda: F242. Legendary mother of Helen of Troy, Clytemnestra, Castor, and Pollux.

Leimone: *Ath*. f5

Leleges: F210. Pre-Greek inhabitants of the Aegean.

Lemnos: 522^{a}13, 18, *Ath*. 61.6, 62.2. Island in the northern Aegean.

Lenaean: *Ath*. 57.1. Festival of Dionysus.

Leodamas: 1364^{a}19, 1400^{a}31. 4th-cent BC statesman and orator from Acharnae.

Leontini: 520^{b}1, 1275^{b}27, 1310^{b}29, 1316^{a}36. City in Sicily.

Leophanes: 765^{a}25. Scientist and naturalist (in or before 4th cent BC).

Leptines: 1411^{a}4. Athenian orator.

Lesbos, Lesbian: 621^{b}22, 763^{b}1, 1137^{b}30, 1284^{a}40, *Ath*. 24.2. Island in the northeastern Aegean.

Leto: 580^{a}17, 1414^{a}3. Mother of Apollo.

Leucas: 1266^{b}22, F210. Corinthian colony founded in the 7th cent BC.

Leucippus: 213^{a}34, 275^{b}30, 300^{b}8, 303^{a}4, 12, 18, 315^{b}6, 29, 325^{a}1, 23, ^{b}6, 11, 26, 404^{a}5, 985^{b}4, 1071^{b}32, 1072^{a}7, 1084^{b}27. Atomist philosopher; teacher of Democritus.

Leucothea: 1400^{b}5. Originally Ino, she was transformed into a sea goddess.

Libation Bearers of Aeschylus: 1455^{a}4

Libya: 350^{b}10, 352^{b}32, 358^{b}3, 363^{a}5, 606^{a}6, 18, ^{b}9, 14, 19, 20, 607^{a}22, 615^{b}4, 616^{b}5, 655^{a}9, 658^{a}13, 695^{a}17, 697^{b}14, 746^{b}7, 8, 749^{b}17, 1010^{b}11, 1262^{a}20, 1393^{a}30, F65

Licymnius of Chios: 1405^{b}5, 1413^{b}13, 1414^{b}17. Dithyrambic poet and rhetorician.

Liguria(ns): 351^{a}16, 368^{b}32, 493^{b}15

Lipara: 367^{a}6. Island off the northern coast of Sicily.

Lips Wind: 363^{b}19

Lipsydrium: *Ath*. 19.3

Little Iliad: 1459^{b}2, 5

Locris: 1266^{b}19, 1274^{a}22, 27, 1307^{a}38, 1395^{a}1, F210. Greek settlement in southern Italy.

Lycaon: F222. Mythical king of Arcadia.

Lyceum: 219^{b}21, 1385^{a}28, F96. Aristotle's school.

Lycia: 548^{b}20, 606^{a}17. Region in Anatolia.

Lycoleon: 1411^{b}6. Orator.

Lycomedes: *Ath*. f4

Lycophron: 174^{b}32, 185^{b}28, 1045^{b}10, 1280^{b}10, 1405^{b}35, 1406^{a}7, 1410^{a}17, F125. Apparently, a follower or imitator of Gorgias. Known only from Aristotle.

Lyctians: 1271^{b}28. Inhabitants of the city of Lyctus in Crete.

Lycurgus: 1270^{a}7, 1271^{b}25, 1273^{b}33, 1274^{a}29, 1296^{a}20, 1398^{b}17. The (perhaps legendary) architect of the Spartan constitution.

Lycurgus: *Ath*. 13.4, 14.3, 28.2

Lydia, Lydians: 617^{b}19, 1290^{b}17, F110. Present-day Anatolia.

Lygdamis of Naxos: 1305^{a}41, *Ath*. 15.2–3. Tyrant (c. 545–524 BC).

Lynceus: 328^{a}15, F88, F90. Mythical prince gifted with superhuman sight.

Lynceus of Theodectes: 1452^{a}27, 1455^{b}29

Lyncus: 359^{b}17. City in Macedonia.

Lysander: 97^{b}21, 176^{b}5, 1301^{b}19, 1306^{b}33, *Ath*. 34.2–3. Spartan general.

Lysicrates: *Ath*. 26.3

Lysimachus: *Ath*. 45.1. Otherwise unknown.

Macedonia: 596^{a}4, 7, 1310^{b}39, 1324^{b}15, F67

Maeander: 1289^{b}40. River in present-day Turkey.

Maedica: 500^{a}2, 630^{a}19. On the border of Thrace.

Maeotis, Lake: 350^{a}25, 353^{a}1, 362^{b}22, 620^{b}6. Sea of Azov.

Maeotis River: 354^{a}13

Magi: 1091^{b}10, F19, F63, F64, F65, F66. Hereditary caste of Zoroastrian priests.

Magnes: 1448^{a}34. Major early comic poet in Athens.

Magnesia: 1269^{b}7, 1289^{b}39. City in present-day Turkey.

Malea, Cape: 548^{b}25. In the southeast Peloponnese.

Malia: 1297^{b}14. City on the north coast of Crete.

Mandrobulus: 174^{b}27. Perhaps that of Xenocrates.

Mantias: 1398^{b}1. Orator.

Mantinaea, Battle of: 1304^{a}26, 1318^{b}25, 27

Marathon: 569^{b}12, 1396^{a}13, *Ath*. 22.3. Area in the northeast of Attica. Site of the famous battle against the Persians in 490 bc.

Margites: 1141^{a}14, 1448^{b}30, 38. Lost burlesque by Homer.

Marmora, Sea of: 598^{a}25, ^{b}28

Maroneia: *Ath*. 22.7. In eastern Attica near Athens.

Massalia: 1305^{b}4, 1321^{a}30, F216. Present-day Marseilles.

Medea: 1453^{b}29. Wife of Jason.

Medea of Carcinus: 1400^{b}10, 11

Medea of Euripides: 1454^{b}1

Medes: 1284^{b}2, 1339^{a}35

Media(n): 522^{b}26, 552^{b}9, 595^{b}28, 627^{b}17. Ancient country in what is now northwestern Iran.

Medius: 618^{b}14. Of Larissa.

Medon: *Ath*. 3.1. The first of the life archons.

Medusa: F166

Megacles (of Mytilene): 1311^{b}25

Megacles, Son of Hippocrates: *Ath*. f6, 13.4, 14.3–4, 15.1, 22.5. Leading member of the Alcmaeonid family.

Megalopolis: F211. City in Arcadia.

Megara, Megarians: 1008^{b}14, 1123^{a}24, 1236^{a}38, 1242^{b}25, 1280^{b}14, 1300^{a}17, 1302^{b}31, 1304^{b}35, 1305^{a}24, 1357^{b}33, 1448^{a}31, *Ath*. 14.1, 17.2, F210. City on the Isthmus of Corinth.

Megarians: 1046^{b}29. School of philosophers founded by Euclides of Megara.

Melanippe: 1454^{a}31

Melanippides: 1409^{b}27. Dithyrambic poet from Melos (second half of 5th cent bc).

Melanopus: 1374^{b}25. Athenian ambassador to Thebes in 370/1 bc with Callistratus, and his rival.

Meleager: 1365^{a}12, 1453^{a}20

Meleager of Antiphon: 1379^{b}15, 1399^{b}25, 27

Meletus: 1419^{a}8. Prosecutor of Socrates in 399 bc.

Melissus of Samos: 104^{b}22, 167^{b}13, 168^{b}35, 181^{a}27, 184^{b}16, 185^{a}9, ^{b}17, 186^{a}6, 207^{a}15, 213^{b}12, 214^{a}27, 298^{b}17, 986^{b}19, F22. Follower of Parmenides (5th cent bc).

Melite: 612^{b}10. Island off the Dalmatia, now Meleda.

Melobius: *Ath*. 29.1. Possibly one of the Thirty Tyrants.

Memphis: 352^{a}1. City in Egypt.

Menelaus: 1454^{a}29, 1461^{b}21. Brother of Agamemnon; husband of Helen.

Meno: F206. Doctor and student of Aristotle.

Mentor: 1197^{b}22. Perhaps Mentor of Rhodes, instrumental in the death of Hermias, tyrant of Atarneus.

Mercury: 432^{b}33, 1073^{b}31, F189

Merope: 1111^{a}12, 1454^{a}5. Supposed mother of Oedipus.

Meses Wind: 363^{b}34

Messapium, Mount: 630^{a}19

Messenia, Messanians: 1269^{b}4, 1270^{a}3, 1306^{b}38, 1397^{a}10, 1418^{b}10. Region in the southwestern Peloponnese.

Messianicus: 1373^{b}18, 1397^{a}11. Oration by Alcidamas.

Metapontium: 1229^{a}24, F176. City on the gulf of Tarentum.

Metrodorus: F143. Epicurean philosopher (c. 331–278 BC).

Miccalus: 47^{b}30.

Midas: 1257^{b}16, F75. Mythical Phrygian king.

Miletus, Milesians: 605^{b}26, 1151^{a}9, 1259^{a}6, 1267^{b}22, 1298^{a}13, 1305^{a}17. City on the western coast of Anatolia, in modern-day Turkey.

Milo: 1106^{b}3. A famous wrestler from Croton (late 6th cent BC).

Miltiades: 1411^{a}10, *Ath*. 28.2. Athenian general (550–489 BC).

Minos: 1271^{b}31, 38, 1329^{b}4, 6, 25, F212. Semi-mythical Cretan king.

Mithridates: 1312^{a}16

Mitys: 1452^{a}8. Of Argos.

Mixidemides: 1398^{b}25, 27. Otherwise unknown.

Mnaseas: 1304^{a}11

Mnasilochus: *Ath*. 33.1

Mnasitheus of Opus: 1462^{a}7. Otherwise unknown.

Mnason: 1304^{a}11. Phocian general.

Mnesithides: *Ath*. 26.2

Moerocles: 1411^{a}16. Athenian orator from Salamis.

Molossia(ns): 608^{a}28, 1310^{b}40, 1313^{a}24. In Epirus.

Momus: 663^{a}35, ^{b}2. A personification of blame.

Munichia: *Ath*. 19.2, 38.2, 38.3, 42.3, 61.1. A hill east of Piraeus.

Musaeus: 563^{a}18, 1339^{b}21. Semi-legendary bard.

Muses: F183, F242

Mycenae: 352^{a}11. City in the northeastern Peloponnese.

Mynniscus: 1461^{b}34. Actor from Chalcis (460s BC).

Myron: 1316^{a}30. Tyrant of Sicyon. Otherwise unknown.

Myron: *Ath*. 2.1. Otherwise unknown.

Mysia: 1405^{a}30, 1460^{a}32. Region in northeast Asia Minor (present-day Turkey).

Mysian Prey: 1372^{b}32

Mysians, the: 1342^{b}10, 1460^{a}32

Mytilene: 1285^{a}35, 1304^{a}4, 1311^{b}26, 1398^{b}12. City on the island of Lesbos.

Nanos: F216

Nauplia: 602^{a}8. Coastal city in the Peloponnese.

Nausicrates: 1416^{a}10. A student of Isocrates.

Naxos: 496^{b}26, 677^{a}2, 1305^{a}41, ^{b}1. Island in the central Aegean.

Nemea: F243

Nemean Games: 1018^{b}18

Neophron of Sicyon: F221. Dramatist and contemporary of Euripides.

Neoptolemus: 1146^{a}19, 1151^{b}18. Son of Achilles.

Neoptolemus: 1459^{b}6

Nesaea: 632^{a}30. Plain in Media.

Nessus River: 350^{b}18, 579^{b}7, 606^{b}16

Nestor: 117^{b}24. Wise man in the *Iliad*.

Nicanor: 1397^{b}8. Otherwise unknown.

Nicanor: F243. Distinguished officer in the service of Alexander the Great (c. 397–319 BC).

Niceratus: 1413^{a}6, 8. Probably Niceratus of Cydantidae, victim of the Thirty Tyrants.

Nicias: *Ath*. 28.3, 28.5. Athenian general and politician (c. 470–413 BC).

Nicochares: 1448^{a}13. Comic poet, slightly later than Hegemon of Thasos.

Nicodemus: *Ath*. 22.7

Nicomachus: F236. Aristotle's father.

Nicomachus: F243. Aristotle's son.

Nicomachus: 345^{a}2. Athenian archon (341/0 BC).

Nicon: 1412^{a}34

Nicostratus: F157. 2nd-cent BC Platonist philosopher.

Nile, the: 98^{a}31, 350^{b}14, 351^{b}30, 353^{a}16, 356^{a}28, 597^{a}6, F201, F202

Ninus: 601^{b}3. Capital of the Assyrian Empire.

Niobe: 1148^{a}33, 1456^{a}17

Nireus: 1414^{a}2, 3

Nisyros: 617^{a}24. Island in the Aegean.

Notium: 1303^{b}10. Port of Colophon.

Notus Wind: 363^{b}15

Nyses: 350^{b}12. Unidentified river.

Ochus: F65

Odysseus: 117^{b}13, 24, 575^{a}1, 1146^{a}21, 1151^{b}20, 1338^{a}28, 1363^{a}17, 1380^{b}23, 1400^{a}27, 1416^{b}1, 12, 1454^{a}29, 1457^{b}11, 1460^{a}35, 1461^{b}7, F164. Homeric hero.

Odysseus the False Messenger: 1455^{a}13

Odysseus, Wounded: 1453^{b}34

Oedipus: 1452^{a}25, 1553^{a}11

Oedipus of Carcinus: 1417^{b}18

Oedipus of Sophocles: 1452^{a}24, 33, 1453^{b}7, 1454^{b}8, 1455^{a}18, 1460^{a}30, 1462^{b}2

Oeneus: 1397^{b}19. The father of Meleager.

Oeneus: 1417^{a}15. Lost play of Euripides.

Oenophyta, Battle of: 1302^{b}29. Between Thebes and Athens (456 BC).

Oenotria(ns): 1329^{b}9, 10

Oeta, Mount: 522^{a}7. In central Greece.

Olympia: 1398^{b}33. Town in Elis in the Peloponnese. Site of the famous games.

Olympias Wind: 363^{b}24

Olympic Games: 206^{a}24, 1099^{a}2, 1147^{b}36, 1233^{b}12, 1274^{a}34, 1339^{a}1, 1357^{a}20, 21, 1365^{a}25, 1367^{b}18, F90, F222

Olympic Speech of Gorgias: 1414^{b}31

Olympus: 1340^{a}9. 7th-cent BC poet from Phrygia.

Olynthian War: 1411^{a}6. Between Athens and Philip of Macedon (349 BC).

Olynthus, Olynthia: F230. Region in Macedonia.

Onatas: F109. Purported rival of Pythagoras.

Onomacritus: 1274^{a}25, F20. Perhaps the poet and divine (end of the 6th cent BC).

Onomarchus: 1304^{a}12. Phocian general (killed 352 BC).

Opicians: 1329^{b}19

Opus: 576^{b}25, 1287^{a}8, 1462^{a}8, F210. Chief city of Locris.

Orchomenus: 605^{b}31

Orestes of Euripides: 1454^{a}29, 1461^{b}21

Orestes: 1405^{b}22, 1452^{b}6, 1453^{a}20, 37, ^{b}24, 1454^{b}32, 1455^{a}5, 7, ^{b}14. Son of Agamemnon and Clytemnestra.

Orestes of Euripides: 1454^{a}29, 1461^{b}21

Orestes of Theodectes: 1401^{a}35

Oreus: 1303^{b}18, *Ath*. 33.1. City (also Hestiaea) on the island of Euboea.

Orion: 343^{b}23, 30, 361^{b}24, 30

Orpheus: 734^{a}19, F20, F21

Orphic Poems: 410^{b}28, F20, F21

Orthagoras of Sicyon: 1315^{b}13

Oxylus: 1319^{a}12. Probably the mythical ancient founder of Elis.

Paches: 1304^{a}6. Athenian general who captured Mytilene in 428 BC.

Paeania: *Ath*. 14.4. A deme of Athens.

Paeonia(ns): 499^{b}13, 500^{a}1, 630^{a}18, 19. Roughly, present-day North Macedonia.

Palamedes: 1413^{b}26. Greek hero at Troy.

Palestine: 359^{a}17

Palladium: *Ath*. 57.3. Southeast of the Acropolis and west of the temple of Olympian Zeus.

Pallene: *Ath*. 15.3, 17.4. Near Marathon.

Pammenes: 1243^{b}20. Identity uncertain.

Pamphile: 551^{b}16

Pamphilus: 1400^{a}4. Writer on rhetoric. Otherwise of uncertain identity.

Pan: 1401^{a}16. God of shepherds and the pastoral world.

Panaetius of Leontini: 1310^{b}29, 1316^{a}37. First Sicilian tyrant.

Panathenaean Festival: 712^{a}34, 724^{b}2, *Ath*. 18.2, 43.1, 49.3, 54.7, 60.1–3, 62.2, F222. In honor of Athena as patron goddess of Athens.

Pandion: *Ath*. f1

Panegyricus of Isocrates: 1408^{b}16, 1418^{a}32. Written c. 380 BC.

Pangaeus, Mt.: *Ath*. 15.2. Near the Thracian coast.

Pantacles: F220. 5th-cent BC poet.

Paralian, Paralus: 1411^{a}12, *Ath*. 61.7. Trireme kept in reserve at the Piraeus for state purposes.

Parians: 1398^{b}10. Paros is an island in the central Aegean.

Paris (Alexandros): 1363^{a}18, 1397^{b}21, 1398^{a}22, 1399^{a}3, 1401^{b}20, 35, 1414^{b}38. Son of Priam.

Parmenides of Elea: 182^{b}26, 184^{b}16, 185^{a}9, ^{b}18, 186^{a}7, 22, 188^{a}20, 192^{a}1, 207^{a}15, 298^{b}17, 318^{b}6, 330^{b}14, 648^{a}29, 984^{b}3, 25, 986^{b}18, 1001^{a}32, 1009^{b}21, 1089^{a}3, F22, F84. Presocratic philosopher (c. 515–435 BC).

Parnassus: 681^{a}23. In central Greece.

Parnassus Mountain, So-called: 350^{a}20. Perhaps the Paropamisus, the Hindu Kush.

Parnes: *Ath*. 19.3. Mountain range north of Athens.

Paron the Pythagorean: 222^{b}18. Otherwise unknown.

Patroclus: 1359[a]4, 1397[b]22, F29, F165, F222. Friend of Achilles.

Pausanias: 1311[b]2. Killer of Philip of Macedon.

Pausanias, King: 1301[b]20, 1307[a]4, 1333[b]34, *Ath.* 23.4, 38.3–4. Of Sparta.

Pauson: 1050[a]20, 1340[a]36, 1448[a]6. Painter, about whom little is otherwise known.

Pegasus: F166

Peitholaus and Lycophron: 1410[a]17, 1411[a]13. Assassins of Alexander of Pherae, defeated by Philip of Macedon in 353/2 BC.

Pelargic Wall: *Ath.* 19.5

Peleus: 1071[a]22, 1418[a]36. Father of Achilles.

Peleus: 1456[a]2

Pelias: 1225[b]5, F222. The legendary king of Iolcus.

Peloponnese: 152[a]14, 351[a]2, 593[a]11, 618[b]15, 1271[b]36, 1276[a]27, 1409[b]12. Peninsula in the southernmost part of mainland Greece.

Peloponnesians: *Ath.* 38.2

Pelops: F222. Legendary king in the Peloponnese.

Pelusium: 617[b]30, 31. On the Egyptian coast.

Penelope: 1417[a]14. Wife of Odysseus.

Pentheus: 1400[b]24. King of Thebes dismembered by maenads in Euripides' *Bacchae*.

Penthilius of Mytilene, Penthilids: 1311[b]27, 29

Peparethus: 1398[a]33. Island off the northeast tip of Euboea.

Periander of Ambracia: 1304[a]32, 1311[a]39. Nephew of Periander of Corinth.

Periander of Corinth: 1284[a]26, 28, 1311[a]20, 1313[a]37, 1315[b]25, 28, 1375[b]31. Tyrant (625–585 BC).

Pericles: 1140[b]8, 1274[a]8, 1365[a]31, 1390[b]31, 1407[a]1, 1411[a]1, 14, 1419[a]2, *Ath.* 26.4, 27, 28.1–3. Athenian politician (c. 495–429 BC).

Perinthus: 773[a]26. Town in Thrace.

Perrhaebeans: 1269[b]6. Inhabitants of Perrhaebia, in the northmost district of ancient Thessaly.

Persephone: F183

Persia, Persians: 580[b]29, 1134[b]26, 1160[b]27, 31, 1274[a]13, 1284[a]41, 1313[a]38, [b]9, 1324[b]11, 1339[a]34, F65

Persian Wars: 94[a]36, 1018[b]17, 1274[a]13, 1303[a]5, [b]33, 1304[a]21, 1307[a]4, 1341[a]30, *Ath.* f4, 23.1, 25.1, 41.2

Petta: F216

Phaenippus: *Ath.* 22.3

Phaethon: 345[a]16, 400[a]31. Son of Helios.

Phalaris: 1148[b]23, 1203[a]23, 1310[b]28, 1393[b]9, 11, 23. Cruel tyrant of Acragas (c. 570–c. 549 BC).

Phaleas of Chalcedon: 1266[a]39, [b]31, 1267[a]17, [b]19, 1274[b]9. Older contemporary of Plato.

Phaleron: 596[b]24. A port of Athens.

Phanothea: F15

Pharnabazus: 580[b]7. Persian satrap (c. 450–370 BC).

Pharnaces: 580[b]7

Pharos: 607[a]14. Island in the Nile delta.

Pharsalus: 586[a]13, 618[b]14, 1262[a]24, 1306[a]10. City in Thessaly.

Phasis: 522[b]14. City on the eastern coast of the Black Sea.

Phasis River: 350[a]26, F121. Now the Rioni.

Phayllus: 1417[a]15. Otherwise unknown.

Phaÿllus of Acherdus: *Ath*. 38.3

Pheidon of Argos: 1310[b]26, *Ath*. 10.2. Tyrant (mid-7th cent BC).

Pheidon of Corinth: 1265[b]12. Otherwise unknown.

Phemonoe: F15. Mythical first priestess at Delphi.

Pherae: F67

Pherecydes: 557[a]3, 1019[b]9. Syrian poet (c. 600–525 BC).

Phidias: 1141[a]10. Sculptor (active c. 465–425 BC).

Philaigis: 464[b]2. Otherwise unknown.

Philammon: 1413[a]14, 25, 26. Athenian athlete and Olympic victor.

Philemon: 1413[b]25. Actor (early to mid-4th cent BC).

Philip of Macedon: 1311[b]2, 1397[b]31, F226, F228, F230

Philippus: 406[b]17. Son of Aristophanes; comic poet of the Middle Comedy.

Philippus of Isocrates: 1418[b]27

Philocrates: 1380[b]8. 4th-cent BC Athenian orator and statesman.

Philoctetes: 1150[b]9, 1413[a]7. Greek hero abandoned on Lemnos with his famous bow.

Philoctetes of Aeschylus: 1458[b]22, 1459[b]5

Philoctetes of Sophocles: 1146[a]20, 1151[b]18

Philolaus: 1225[a]33. Pythagorean philosopher from Croton in southern Italy (c. 470–385 BC).

Philolaus the Corinthian: 1274[a]31, 32, 41, [b]2. Legislator for the Thebans. Otherwise unknown.

Philomela: 1406[b]17

Philoneus: *Ath*. 17.1

Philoxenus: 1342[b]9, 1448[a]15, F121. Dithyrambic poet from the island of Cythera (c. 435–380 BC).

Philoxenus: 1231[a]17. Character in ancient comedy.

Phlegraean Plain: 368[b]31. Near Naples.

Phocaea(ns): F216. City on the western coast of present-day Turkey.

Phocis, Phocians: 69[a]2, 1304[a]10, 13, 1398[a]1. City in central Greece.

Phocylides: 1295[b]33. 6th-cent BC poet from Miletus.

Phoenicia, Phoenicians: 364[a]3, 17, 525[b]7, 541[a]19, 577[b]23, 603[a]1, F65, F213. Roughly present-day Lebanon.

Phoenician Women: 1167[a]33

Phoenicias, Wind: 364[a]4

Phormisius: *Ath*. 34.3

Phoxus: 1304[a]29. Otherwise unknown.

Phreatus, Court of: 1300[b]29, *Ath*. 57.3. Homicide court on the east shore of Piraeus.

Phrygia: 517[a]28, 522[a]28, 580[b]6, 617[b]19

Phrygian Mode: 1276[b]9, 1290[a]22, 1342[b]7

Phrynichus: 1305[b]27, *Ath*. 32.2. Anti-democratic member of the Four Hundred.

Phrynis: 993[b]16. Lyre player and lyric poet from Mytilene.

Phye: *Ath*. 14.4

Phyle: *Ath*. 37.1, 38.2, 41.2. On the south side of Parnes.

Pillars of Heracles: 298[a]11, 350[b]3, 354[a]3, 12, 23, 362[b]21, 28, 363[a]19, 24, [b]10, 22, 32, 462[b]25, 1388[a]11, F90

Pindar: 1364[a]28, 1401[a]17. Lyric poet from Thebes (c. 518–438 BC).

Pindarus: 1461[b]35. Otherwise unknown.

Pindus: 350[b]16. Mountain in northern Greece.

Piraeus: 1267[b]23, 1303[b]11, 1401[a]27, 31, 1411[a]14, 16, 35.1, 38.3, 39.6, 40.2, 40.3, 41.2, 42.3, 50.2, 51.1–3, 54.8, 61.1. Port of Athens.

Pisander: 1419[a]27, *Ath*. 32.2. Athenian politician.

Pisistratus, Pisistratids: 1305[a]23, 1310[b]30, 1311[a]36, 1312[b]31, 1313[b]23, 1315[b]21, 30, 31, 1357[b]32, *Ath*. 13.4, 14–17, 19.4–5, 22.3, 28.2, 41.2. Athenian political reformer and eventual tyrant (561 BC).

Pittacus: 70[a]17, 1167[a]32, 1274[b]18, 1285[a]35, 38, 39, 1389[a]16, 1402[b]11. One of the Seven Sages; elected ruler of Mytilene in 589 BC.

Pitthus: 1400[a]9. Deme of Athens.

Plates: 551[b]16

Plato: 122[b]26, 140[a]3, [b]4, 148[a]15, 187[a]17, 203[a]4, 8, 15, 206[b]27, 209[b]11, 33, 251[b]17, 315[a]29, [b]30, 325[b]25, 329[a]14, 330[b]16, 332[a]29, 404[b]16, 406[b]26, 472[b]6, 642[b]5, 651[b]20, 652[a]25, 656[a]15, 664[b]5, 669[a]15, 676[b]20, 987[a]29, [b]4, 12, 988[a]7, 26, 990[a]30, 992[a]21, 996[a]6, 1001[a]9, 1010[b]12, 1019[a]4, 1026[b]14, 1028[b]19, 1053[b]13, 1064[b]29, 1070[a]18, 1071[b]32, 37, 1083[a]32, 1095[a]32, 1104[b]12, 1172[b]28, 1182[a]24, 1194[a]6, 1252[a]7, 1253[b]18, 1255[b]17, 1261[a]6, 1262[b]37, 1263[b]29, 1266[b]5, 1271[b]1, 1274[b]9, 1293[b]1, 1327[a]11, 1398[b]28, 1406[b]32, 1417[a]21, F2, F9, F23, F24, F25, F26, F27, F45, F49, F52, F53, F54, F56, F58, F59, F61, F70, F78, F106, F107, F111, F122, F133, F145, F147, F173, F174, F225, F226, F227, F241

- *Gorgias*, F93
- *Hippias Minor*, 1025[a]6
- *Laws*, 1264[b]26, 1265[a]1, [b]16, 1266[a]1, 29, [b]5, 1271[b]1, 1336[a]36
- *Menexenus*, 1415[b]31
- *Meno*, 67[a]21, 71[a]29
- *Phaedo*, 335[b]10, 355[b]32, 991[b]3, 1080[a]2, F68, F76
- *Phaedrus*, 1408[b]20
- *Philebus,* F59
- *Republic*, 1194[a]6, 1216[a]6, 9, 1262[b]20, 1264[b]28, 1291[a]11, 1316[a]1, 1342[a]33, 1406[b]32, F38, F168
- *Sophist*, F145
- *Symposium*, 1262[b]11
- *Timaeus*, 210[a]2, 280[a]30, 239[b]32, 300[a]1, [b]17, 306[b]18, 308[b]4, 315[b]30, 352[b]24, 329[a]13, 29, 404[b]16, 406[b]26, 472[b]6, F10, F192

Plato: 140[a]3, 1376[a]10. Athenian comic poet; contemporary of Aristophanes.

Pleiades: F183

Plexippus: 1379^{b}15

Plutarch: F180, F198

Polus: 981^{a}4, 1400^{b}20. Teacher of rhetoric from Acragas.

Polyaenus: F11. Epicurean philosophy and author of *Against Aristotle's On Philosophy*.

Polybus: 512^{b}12. Student and son-in-law of Hippocrates.

Polybus: 1415^{a}20. Father of Oedipus.

Polyclitus: 195^{a}33, ^{b}11, 1013^{b}35, 1014^{a}6, 14, 15, 1141^{a}11. Sculptor active c. 460–410 BC.

Polycrates: 1313^{b}24. Tyrant of Samos c. 535–522 BC.

Polycrates: 1401^{a}34, ^{b}15. 4th-cent BC rhetorician.

Polydamas: 1116^{a}23, 1191^{a}9, 1230^{a}21. Trojan hero.

Polyeuctus: 1411^{a}21. Athenian orator.

Polygnotus: 1340^{a}37, 1448^{a}5, 1450^{a}27. Painter from Thasos (c. 500–c. 440 BC).

Polyidus: 1455^{a}6. Sophist. Otherwise unknown.

Polyneices: 1373^{b}10. Brother of Antigone.

Polyphemus: F167. Cyclops and son of Poseidon.

Polyxenus: F174. Sophist.

Polyzelus: F96

Pontus: 347^{a}36, ^{b}4, 348^{b}34, 367^{a}1, 554^{b}8, 18, 596^{b}31, 600^{b}13, 605^{a}21, 606^{a}10, 20, 632^{b}9. City on the Black Sea.

Pordoselene: 605^{b}29. Island near Lesbos.

Porphyry of Tyre: F15, 59. 3rd-cent AD Platonist philosopher.

Poseidon: 1455^{b}18, F166. God of the sea.

Potidaea: 1396^{a}20. Colony of Corinth founded in 600 BC in northern Greece.

Pratys: 1413^{a}7, 9. Rhapsode. Otherwise unknown.

Priam: 618^{b}27, 1100^{a}8, 1101^{a}8, 1145^{a}21, 1362^{b}36, 1363^{a}6, 1414^{b}38, 1416^{b}1, 3. King of Troy.

Proclus of Athens: F79. Platonist philosopher (c. 412–485 AD).

Prodicus: 1243^{b}22. Perhaps the Hippocratic doctor from Selymbria.

Prodicus of Ceos: 112^{b}22, 1415^{b}15. 5th-cent BC teacher of rhetoric.

Prometheus: 1456^{a}2

Protagoras of Abdera: 173^{b}19, 998^{a}3, 1007^{b}22, 1009^{a}6, 1047^{a}6, 1053^{a}35, 1062^{b}13, 1164^{a}24, 1402^{a}25, 1407^{b}6, 1456^{b}15, F92, F96, F163. Sophist (c. 490–c. 420 BC).

Protarchus: 197^{b}10. Orator and pupil of Gorgias.

Protos: F216

Proxenus: F243. Nicanor's father. Arimneste, Aristotle's sister, may have been his mother.

Prytanis: F133. Probably the Peripatetic philosopher (1st cent BC).

Psammeticus: 1315^{b}26. Tyrant of Corinth.

Psychrus River: 519^{a}14. East of Pontus.

Pygmies: 596^{b}6

Pylos: *Ath.* 27.5, In the Peloponnese.

Pyramids of Egypt: 1313^{b}21

Pyrene: 350^{b}1. The Pyrenees.

Pyrrha: 544^{a}22, 548^{a}9, 603^{a}21, 621^{b}12, 680^{b}1, 763^{b}1, F243. Town on Lesbos.

Pyrrha: 1024^{a}37. Wife of Deucalion.

Pyrrhus, King: 522^{b}24, 595^{b}18. Probably the son of Achilles, also called "Neoptolemus."

Pythagoras of Samos: 1182^{a}11, 1398^{b}14, F90, F176, F177, F178, F182, F183, F193. Philosopher and mathematician (c. 570–c. 495 BC).

Pythagoreans: 94^{b}33, 203^{a}4, 204^{a}33, 213^{b}23, 222^{b}18, 268^{a}11, 284^{b}7, 285^{a}10, ^{b}25, 293^{a}20, ^{b}1, 300^{a}17, 342^{b}30, 345^{a}14, 404^{a}17, 407^{b}22, 439^{a}31, 445^{a}16, 985^{b}23, 986^{b}1, 987^{a}13, 987^{b}11, 23, 31, 989^{b}29, 990^{a}33, 996^{a}6, 1001^{a}10, 1036^{b}18, 1053^{b}12, 1072^{b}31, 1078^{b}21, 1080^{b}16, 31, 1083^{b}8, 1090^{a}20, 31, 1091^{a}13, 1096^{b}5, 1106^{b}30, 1132^{b}22, 1194^{a}29, 1344^{a}10, F21, F53, F54, F59, F90, F176, F179, F180, F181, F186, F188, F189, F190, F191

Pythia: F233, F243. Aristotle's wife.

Pythian Games: 1018^{b}18, 1460^{a}31

Pythian Oracle: 1331^{a}27, *Ath.* 19.5, F14, F15, F16, F226

Pytho: F15. Region including Delphi.

Pytho: 1243^{b}20. Identity uncertain.

Pytho: F222

Pythodorus: *Ath.* 27.2, 29.1–2, 35.1, 41.1, F96

Python: 1311^{b}20. Identity uncertain.

Red Sea: 352^{b}23, 354^{a}2, 606^{a}12

Rhadamanthys: 1132^{b}25, 1413^{b}26. Son of Zeus and Europa; one of the judges of the dead in Hades.

Rhaicelus: *Ath.* 15.2

Rhea: F183

Rhegium: 1274^{b}23, 1316^{a}38. City on the Italian side of the straits of Messina.

Rhinon: *Ath.* 38.3–4. One of the Ten who followed the Thirty Tyrants.

Rhipae, Mountains: 350^{b}7. A doubtful range perhaps parallel to the Hercynian mountains.

Rhodes: 763^{a}31, 1271^{b}37, 1302^{b}23, 32, 1304^{b}27, F64, F142. Largest of the Dodecanese islands.

Rhodope, Mountain: 350^{b}18. Mostly in Bulgaria, partly in Greece.

Rhone: 351^{a}16

Sack of Troy: 1459^{b}6

Salamis: 569^{b}11, 1304^{a}22, 1375^{b}30, 1396^{a}12, 1411^{a}32, 1459^{a}25, *Ath.* 17.2, 22.7, 23.1, 23.5, 27.2, 54.8, 62.2. Island in the Saronic gulf near Athens.

Samos, Samians: 1284^{a}39, 1303^{a}36, 1306^{a}30, 1313^{b}24, 1384^{b}32, 1393^{b}23, 32, 1407^{a}1, *Ath.* 24.2, 62.2. Island in the eastern Aegean.

Sappho: 1367^{a}8, 1398^{b}12, 27, F135. Lyric poet from Lesbos (born c. 612 BC).

Sardanapalus: 1095^{b}22, 1216^{a}16, 1312^{a}1. Luxury-loving Assyrian king (669–626 BC).

Sardinia: 218^{a}25. Island west of the Italian peninsula.

Sardinian Sea: 354^{a}21

Sardis: 94^{b}1. Capital of ancient Lydia.

Sarmatian: 783^{a}14. An Iranian confederation of peoples.

Satyrus: 1148^{a}34

Scamander: 519^{a}18, 19

Sciron: 1406^{a}8. Famous robber.

Sciron, Wind: 363^{b}25

Scombrus: 350^{b}17. Now Mt. Vitosha, part of the Rila massif.

Scylax of Caryanda: 1332^{b}24. Late-6th-cent BC geographer.

Scylla: 1461^{b}32. Monster in the *Odyssey*.

Scylla of Timotheus: 1454^{a}31

Scyllaeum: *Ath*. 22.8

Scylletium and Lametius, Gulfs of: 1329^{b}12. On the toe of Italy.

Scyros: *Ath*. f4, 62.2. The southernmost island of the Sporades.

Scythia, Scythians: 78^{b}30, 350^{b}7, 359^{b}18, 362^{b}22, 576^{a}21, 597^{a}5, 604^{b}22, 605^{a}21, 606^{a}20, ^{b}4, 607^{a}17, 619^{b}13, 631^{a}1, 748^{a}25, 782^{b}33, 783^{a}13, 1112^{a}28, 1150^{b}14, 1324^{b}11, 17, 1367^{b}10. Lands northeast of Europe and the northern coast of the Black Sea.

Sea of Marmara, the: 598^{a}25, ^{b}28

Selli: 352^{b}2

Sesostris (Senusret III): 352^{b}26, 1329^{b}4, 25. Pharaoh of Egypt (c. 2099–2061 BC).

Sestus: 1411^{a}13. Town on the Hellespont where Athens bought its corn.

Seuthes the Thracian: 1312^{a}14. Probably Seuthes II, son of Sparadocus.

Sicania: 359^{b}15

Sicilian Sea: 354^{a}21, 542^{b}16

Sicily: 359^{b}15, 366^{a}26, 520^{b}1, 522^{a}22, 586^{a}3, 606^{a}5, 1259^{a}23, 1271^{b}39, 1274^{a}25, 1316^{a}35, 1411^{a}25, 1448^{a}32, ^{b}7, 1459^{a}23, *Ath*. 29.1, F67, F163

Sicyon, Sicyonians: 1117^{a}27, 1315^{b}13, 1316^{a}30. City just west of Corinth.

Sigeum: 547^{a}5, 549^{b}16, 1375^{b}31. City in the northwest of the Troad region of Anatolia.

Silenus: F75. Mythical follower of Dionysus.

Simonides: 542^{b}7, 982^{b}30, 1091^{a}7, 1100^{b}21, 1121^{a}7, 1363^{a}15, 1367^{b}19, 1391^{a}8, 1405^{b}24, F126. Poet from Iulis on Ceos (c. 556/532–466/442 BC).

Simus the Aleuad: 1306^{a}30. Probably the betrayer of Thessaly to Philip of Macedon.

Siphae: 504^{b}32, 696^{a}5, 708^{a}5. Town on the Corinthian Gulf.

Sipylus: 368^{b}31. Mountain in Lydia.

Sirens: 1230^{b}36

Siritis: 1329^{b}21

Sirras: 1311^{b}12. Possibly the son of Arrabaeus.

Sisyphus: 1412^{a}5, 1456^{a}22, F222. King and founder of Corinth.

Smerdes: 1311^{b}29. Killer of Penthilus; otherwise of uncertain identity.

Smindyrides the Sybarite: 1216^{a}17

Socrates: 103^{a}30, 160^{b}27, 166^{b}34, 183^{b}7, 642^{a}28, 644^{a}25, 767^{b}25, 768^{a}2, 29, 32, ^{b}14, 987^{b}1, 2, 1078^{b}17, 28, 30, 1086^{b}3, 1116^{b}4, 1127^{b}25, 1144^{b}18, 28, 1145^{b}23, 25, 1147^{b}15, 1182^{a}15, 1183^{a}8, 1187^{a}7, 1190^{b}28, 1198^{a}10, 1200^{b}25, 1216^{b}2, 1229^{a}16, 1230^{a}8, 1235^{a}38, 1246^{b}36, 1247^{b}16, 1260^{a}22, 1261^{a}6, 12, 16, ^{b}19, 21, 1262^{b}6, 9, 1263^{b}30, 1264^{a}12, 29, ^{b}7, 24, 29, 37, 1265^{a}11, 1291^{a}12, 1316^{a}2, ^{b}27, 1342^{a}33, ^{b}23, 1357^{b}12, 1367^{b}8, 1390^{b}31, 1393^{b}4, 1398^{a}24, ^{b}31, 1415^{b}30, 1419^{a}8, F13, F14, F126, F159, F174, F226. Philosopher, chief interlocutor in Plato's dialogues (470–399 BC).

Socrates of Theodectes: 1399^{a}8

Socrates the Younger: 1036^{b}25. In later life a member of Plato's Academy.

Solon: 1100^{a}11, 15, 1179^{a}9, 1219^{b}7, 1256^{b}32, 1266^{b}17, 1273^{b}34, 35, 41, 1274^{a}11, 15, 1281^{b}32, 1296^{a}19, 1375^{b}32, 34, 1398^{b}15, *Ath.* 2.2, 3.5, 5–12, 13.1, 14.2–3, 17.1, 22.1, 28.2, 29.3, 35.2, 41.2, F219. Athenian statesman, poet, and architect of the Athenian constitution (c. 640–560 BC).

Sons of Phineus: 1455^{a}10

Sophocles: 1015^{a}30, 1146^{a}19, 1151^{b}18, 1373^{b}9, 1375^{a}33, 1400^{b}17, 1415^{a}20, 1417^{a}28, 1448^{a}26, 1449^{a}19, 1453^{b}31, 1454^{b}8, 1455^{a}18, 1456^{a}27, 1460^{b}33, 1462^{b}3. Tragic poet (497/6–406/5 BC).

Sophocles: 1419^{a}26. Preliminary councilor.

Sophocles: 1374^{b}36, 1416^{a}15. Identity uncertain.

Sophron of Syracuse: 1447^{b}10. Writer of mimes (fl. 430 BC).

Sosistratus: 1462^{a}7. Otherwise unknown.

Sotion of Alexandria: F65. Doxographer (fl. 2nd cent BC).

Sparta, Spartans: 152^{a}14, 176^{b}5, 1102^{a}11, 1112^{a}29, 1117^{a}27, 1124^{b}16, 1127^{b}28, 1145^{a}28, 1167^{a}31, 1180^{a}25, 1245^{b}33, 1248^{b}39, 1263^{a}35, ^{b}41, 1264^{a}10, 1265^{b}32, 35, 1269^{a}29, 38, ^{b}3, 31, 36, 40, 1271^{a}29, ^{b}17, 23, 28, 41, 1272^{a}2, 13, 14, 27, 36, ^{b}26, 28, 33, 1273^{a}2, 20, ^{b}25, 35, 1275^{b}9, 1279^{b}9, 1285^{a}3, ^{b}35, 37, 1288^{b}41, 1293^{b}16, 1294^{b}19, 1301^{b}19, 1303^{a}7, 10, 1304^{a}26, ^{b}14, 1306^{a}19, ^{b}29, 38, 1307^{a}4, 36, ^{b}22, 23, 1310^{b}39, 1312^{b}7, 1313^{a}25, 1316^{a}18, 21, 34, ^{b}8, 1324^{b}8, 1333^{b}12, 19, 22, 34, 1334^{a}40, 1337^{a}31, 1338^{b}12, 24, 1339^{b}2, 1341^{a}33, 1361^{a}11, 1367^{a}29, ^{b}10, 1398^{b}13, 1411^{a}4, 1415^{b}32, 1419^{a}31, *Ath.* 19, 23.2, 23.4, 29.1, 32.3, 34.1, 37.2–38.4, 40.3, F17, F90, F215

Spartan Women: 1459^{b}6

Spartiates: 1270^{a}37, ^{b}2, 1271^{b}11, 13, 1306^{b}35, *Ath.* 19.4. Adult male citizens of Sparta.

Speusippus: 1028^{b}21, 1072^{b}31, 1096^{b}7, 1153^{b}5, F58, F133. Platonist philosopher (408–339/8 BC).

Speusippus: 1411^{a}21. Otherwise unknown.

Stagira: F228, F230, F239, F243. Aristotle's birthplace.

Stentor: 1326^{b}7. Homeric hero gifted with a very powerful voice.

Stesichorus: 542^{b}25, 1393^{b}9, 10, 1395^{a}1, 1412^{a}22. Poet who lived and worked in Sicily (c. 632–556 BC).

Sthenelus: 1458^{a}21. 5th-cent BC tragic poet, whose style was mocked by Aristophanes.

Stilbon: 1398^{b}3. Theban citizen active in politics.

Stoics: F44, F152, F157

Strabax: 1399^{b}2. Mercenary leader.

Stratonicus: 1231^{a}12. Famous Athenian lute player and wit (c. 410–360 BC).

Strymon River: 350^{b}17, 592^{a}7, 597^{a}10. In Bulgaria and Greece.

Styx: 983^{b}32. Eldest of the daughters of Ocean and Tethys.

Sybaris, Sybarites: 1216^{a}17, 1303^{a}29, 31. City in the instep of the Italian peninsula renowned for its luxury.

Syennesis of Cyprus: 511^{b}23, 512^{b}12

Syme: 1414^{a}2. Island in the Dodecanese chain.

Syracusans, Syracuse: 559^{b}2, 1255^{b}24, 1259^{a}30, 1286^{b}40, 1302^{b}32, 1303^{a}38, ^{b}20, 1304^{a}27, 1306^{a}1, 1310^{b}30, 1312^{b}8, 1313^{b}13, 26, 1315^{b}35, 1316^{a}33, 1384^{b}16, F63. City in Sicily.

Syria: 491^{a}2, 577^{b}23, 579^{b}9, 580^{b}1, 606^{a}13, F63

Syrian Grass: 627^{b}17

Tanais River: 350^{a}25, 353^{a}16. Now the Don.

Tarentum, Tarentines: 631^{a}10, 1291^{b}23, 1303^{a}3, 1306^{b}31, 1320^{b}9, F218. Now Taranto.

Tartarus: 94^{b}34, 356^{a}1. Hades and one of its rivers.

Tartessus River: 350^{b}2. Now the Guadalquivir.

Tegea: 1365^{a}27. City in Arcadia.

Telamon: 1416^{a}3

Teleboa, Teleboae: F210. Mythical prince and his purported descendants.

Telecles of Miletus: 1298^{a}13. Otherwise unknown.

Telegonus: 1453^{b}33. Son of Odysseus.

Telemachus: 1461^{b}5. Son of Odysseus.

Telephus: 1453^{a}21. Telephus was a son of Heracles.

Telephus of Euripides: 1405^{a}28

Telesinus: *Ath*. 22.5

Ten, the: *Ath*. 38.2

Tenedos, Tenedians: 1291^{b}25, 1375^{b}31, 1401^{b}18. Island in the northeastern Aegean.

Teos: 1403^{b}27. Ionian city on the coast of Asia Minor.

Tereus of Sophocles: 1454^{b}36

Tethys: 983^{b}30. Daughter of Earth and Heaven.

Teucer of Sophocles(?): 1398^{a}4, 1416^{b}1. Teucer was son of King Telemon of Salamis and Hesione sister of Priam.

Teumessos: 1408^{a}3. Village of Boeotia in the plain of Thebes.

Thales of Miletus: 294^{a}29, 405^{a}19, 411^{a}8, 983^{b}20, 984^{a}2, 1141^{b}4, 1259^{a}6, 18, 31, F15, F16, F17. Presocratic philosopher (620s–540s BC).

Thales (Thaletas): 1274^{a}28, 29. 7th-cent BC poet from Crete who worked in Sparta.

Thargelia: 1023^{b}11, *Ath*. 56.3–5. Feast of Apollo, held in late May.

Thasos: 549^{b}16, 1448^{a}12, 1461^{a}22. Island in the northern Aegean.

Theagenes: 1305^{a}24, 1357^{b}33. Tyrant of Megara (latter half of the 7th cent BC).

Thebes: 69^{a}1, 202^{b}13, 231^{b}29, 351^{b}35, 500^{a}4, 1093^{a}16, 1269^{b}37, 1274^{a}32, 35, ^{b}2, 1278^{a}25, 1302^{b}29, 1306^{a}38, ^{b}1, 1321^{a}28, 1397^{b}9, 31, 1398^{b}2, 18, *Ath*. 15.2, F222. City in Boeotia in central Greece.

Themiscyra: 554^{b}9. City in northern Anatolia.

Themison of Cyprus: F81. Addressee of Aristotle's *Protrepticus*.

Themistocles: 569^{b}12, 1233^{b}12, 1376^{a}1, *Ath*. 22.7, 23.3, 25.3–4, 28.2. Athenian politician and general (c. 529–459 BC).

Theodamus: 1406^{b}30. Otherwise unknown.

Theodecteа: 1410^{b}2. Perhaps a rhetorical manual by Theodectes.

Theodectes: 1150^{b}9, 1255^{a}36, 1397^{b}3, 1398^{b}5, 1399^{a}8, ^{b}1, 28, 1400^{a}27, 1401^{a}35. 4th-cent BC tragic poet.

Theodectes: F158, F159, F160, F161. Theorist of rhetoric and student of Aristotle.

Theodorus: 1306^{b}28, 1404^{b}22, 1412^{a}33(?). 4th-cent BC tragic actor.

Theodorus: 183^{b}33, 1400^{b}16, 1412^{a}25, 33(?), 1414^{b}13. Teacher of rhetoric from Byzantium (c. 400 BC).

Theodotus: F96

Theognis: 1129^{b}29, 1170^{a}12, 1172^{a}13, 1179^{b}6, 1230^{a}13, 1237^{b}14, 1243^{a}17, F126. Lyric poet from Megara (late 7th or mid-6th cent BC).

Theophrastus of Eresus: F2, F208, F228, F243. Student of Aristotle and head of the Peripatos after the latter's death (c. 371–287 BC).

Theopompus: 1313^{a}26. King of Sparta (c. 720–675 BC).

Theopompus: *Ath*. 33.1

Thera: 1290^{b}11. City on the island of Santorini.

Theramenes: *Ath*. 28.3, 28.5, 32.2, 33.2, 34.3, 36.2, 37.1–2

Thermaic Gulf: *Ath*. 15.2. In the Ionian Sea.

Thermodon River: 554^{b}10, 567^{b}16. In Turkey.

Theseid: 1451^{a}20

Theseum: *Ath*. 62.1. Temple in the Athenian marketplace.

Theseus: 1363^{a}18, 1397^{b}20, 1399^{a}2, *Ath*. f3, f4. Legendary king of Athens.

Thessalus: *Ath*. 17.3, 18.2

Thessaly: 1369^{a}37, ^{b}5, 1331^{a}32, 1373^{a}26, *Ath*. 19.5, F67, F165

Thetis: 1124^{b}15. Mother of Achilles.

Thettaliscus: 1398^{b}4

Thibron: 1333^{b}18. Otherwise unknown.

Thirty Tyrants: 1305^{b}25, 1400^{a}18, 34, 1401^{a}35, *Ath*. 35.1–38.1, 39.6, 40.3, 41.2. Oligarchy in control in Athens for a brief period in 404/3 BC.

Thrace: 519^{a}15, 595^{a}25, 606^{b}3, 620^{a}33, 782^{b}33, 1274^{b}24, 1312^{a}14, 1324^{b}11, 1412^{a}1, *Ath*. 14.4. Region in southeast Europe, bordering on the Black Sea.

Thrascias Wind: 363^{b}29

Thrasippus: 1341^{a}36. Otherwise unknown.

Thrasybulus of Athens: 1400^{a}32, ^{b}19, 1401^{a}34, *Ath*. 37.1, 40.2. Statesman and military leader.

Thrasybulus of Miletus: 1284^{a}27, 32, 1311^{a}20

Thrasybulus of Syracuse: 1312^{b}11, 14, 1315^{b}38

Thrasymachus: 183^{b}32, 1305^{a}1, 1400^{b}20, 1404^{a}14, 1409^{a}2, 1413^{a}8. Sophist and rhetorician from Chalcedon in Asia Minor (fl. c. 400–430 BC).

Three Thousand: *Ath*. 36.2–37.2

Thucydides: *Ath*. 28.2, 28.5

Thurii: 1303^{a}31, 1307^{a}27, ^{b}6. City on the Tarentine gulf, close to Sybaris.

Thyestes: 1453^{a}11, 21. Brother of Atreus.

Thyestes of Carcinus: 1454^{b}23

Timarchus: F243. Member of the Lyceum.

Timon: F74. Probably the 5th-cent BC Athenian misanthrope.

Timonassa: *Ath*. 17.4

Timophanes of Corinth: 1306^{a}23

Timophanes of Mytilene: 1304^{a}7. Otherwise unknown.

Timosthenes: *Ath*. 23.5

Timotheus: 993^{b}15, 16, 1448^{a}15. Lyre player and lyric poet from Miletus (c. 450–360 BC).

Tisias: 183^{b}32, F162. Student of Corax and credited, along with him, with founding the craft of rhetoric.

Tityus: 698^{b}24. Giant.

Torone: 523^{a}7, 530^{b}10, 548^{b}15. A city in Macedonia.

Triballi: 115^{b}23, 26. Savage Thracian tribe, living near the Danube.

Triopium: 1371^{b}36. Coastal town in Caria, near Cnidus.

Troezenians: 1303^{a}29, 1335^{a}20. Inhabitants of the Argolid peninsula.

Trojan War: 352^{a}10

Trojan Women: 1459^{b}7

Trojans: 1116^{a}25, 1396^{b}16

Troy: 222^{a}26, 1100^{a}7, 1139^{b}6, 1363^{a}16, 1396^{b}12, 1456^{a}16, F30, F222

Tydeides (Diomedes): 1116^{a}26. Greek hero at Troy.

Tydeus of Theodectes: 1455^{a}9

Tyndareus: 1397^{b}21. Legendary king of Sparta and husband of Leda.

Tyro of Euripides: 1454^{b}25

Tyrrhenia: 1329^{b}18, F90, F176. Region in west-central Italy.

Tyrrhenian Sea: 354^{a}21

Tyrtaeus: 1306^{b}39. 7th-cent BC elegiac poet from Sparta.

Umbria: 359^{a}35

Ursa Major and Minor: F183

Venus: 1073^{b}31, F189

Women of Phthia: 1456^{a}1

Xanthus: *Ath*. f1

Xanthus: 519^{a}19

Xanthus of Lydia: F95. 6th-cent BC historian.

Xanthippus: *Ath*. 22.6, 28.2. Son-in-law of Cleisthenes' brother Hipparchus.

Xenaenetus: *Ath*. 40.4

Xenarchus: 1447^{b}10. Late-5th-cent BC author of mime plays, son of Sophron.

Xenocrates: 112^{a}37, 141^{a}6, 152^{a}7, 27, F58, F169. Platonist philosopher (339/8–314/3 BC).

Xenophanes of Colophon: 294^{a}23, 986^{b}21, 1010^{a}6, 1377^{a}19, 22, 1399^{b}6, 1400^{b}5, 1461^{a}1. Presocratic philosopher (c. 570–470 BC).

Xenophantus: 1150^{b}12. Possibly the musician of that name in the court of Alexander the Great.

Xenophon of Athens: F133. General and follower of Socrates (c. 430–355/4 BC).

Xerxes: 1311^{b}38, 1393^{b}1, 1406^{a}8, *Ath*. 22.8, F105. King of Persia (486–465 BC).

Xuthus of Croton: 216^{b}26. Little-known philosopher.

Zaleucus: 1274^{a}22, 29. 7th-cent BC legislator for the Locrians living in southern Italy.

Zalmoxis: F65. Deity in the religion of peoples around the Black Sea.

Zanclaeans: 1303^{a}35. Inhabitants of Zancle, present-day Messina.

Zeno: 1372^{b}5. Otherwise unknown.

Zeno of Citium: F81. Founder of the Stoic school of philosophy (c. 334–262 BC).

Zeno of Elea: 65^{b}18, 160^{b}8, 172^{a}9, 179^{b}20, 182^{b}26, 209^{a}23, 210^{b}22, 233^{a}21, 239^{b}5, 10, 250^{a}20, 263^{a}5, 1001^{b}7, 1372^{b}5, F94, F106. Follower and defender of Parmenides.

Zephyrus, Wind: 363^{b}12

Zeus: 166^{b}7, 673^{a}19, 700^{a}1, 1091^{b}6, 1124^{b}16, 1160^{b}26, 1165^{a}16, 1208^{b}31, 1242^{a}39, 1244^{a}14, 1259^{b}13, 1281^{b}18, 1284^{b}31, 1313^{b}23, 1339^{b}8, 1346^{a}33, 1379^{a}4, ^{b}23, 1339^{b}8, 1379^{a}4, 1387^{a}35, 1461^{a}30, *Ath*. 55.3, 55.5, F19, F120, F126, F190, F242, F243

Zeuxis: 1450^{a}27, 28, 1461^{b}12. Painter from Heraclea in Italy (c. 435–490 BC).

Zoroaster: F64, F65. Mythical founder of the Zoroastrian religion.

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